UNITED STATES DEPARTMENT OF AGRICULTURE
BIBLIOGRAPHICAL BULLETIN No. 8

Washington, D. C. Issued April 1947

BIBLIOGRAPHY ON AVIATION AND ECONOMIC ENTOMOLOGY

Compiled by
INA L. HAWES, Librarian
(Assistant in the Division of Bibliography)
and
ROSE EISENBERG, Librarian
(Assistant in the Division of Bibliography)
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PREFACE

This bibliography, which is a revision and enlargement of the Bibliography on the Use of Airplanes in Insect Control, 1922–1933, compiled by W. E. McBath in 1934, covers the years 1919 through 1944. For Russian material, the bibliography prepared by Korotkikh was a valuable source. No attempt has been made to search the literature beyond 1944, although a number of 1945 references have been included.

The references selected for inclusion are those on the relation of aircraft to the control of crop pests, forest insects, and mosquitoes, to the transportation of disease vectors, together with the attendant problems of quarantine and disinfestation, and to insecticidal injury to bees, livestock, etc.; aircraft studies of aerial fauna; and aerial scouting and mapping of infested areas.

Every effort has been made to check the references with the original publications. Where this was not possible, the references have been marked with an asterisk (*). Abstracts in the McBath bibliography and in the Review of Applied Entomology have been used as the basis for many of the annotations. The annotations show insects affected, localities, materials, equipment, technique, and other information pertinent to the operations described. The arrangement is chronological and alphabetical by author for each year, and an author and subject index is provided.

Call numbers following the citations are those of the United States Department of Agriculture Library unless otherwise noted. Abbreviations used are those in Miscellaneous Publication No. 337, Abbreviations Used in the Department of Agriculture for Titles of Publications.

The following books, while not specifically related to the subject of this bibliography, contain information of interest:

Abrams, Talbert.
Essentials of Aerial Surveying and Photo Interpretation. Ed. 1, 289 pp., illus. N. Y., McGraw-Hill Book Co., Inc., 1944. 325.2 Ab8

Smith, H. T. U.
Aerial Photographs and Their Applications. 312 pp., illus. N. Y., D. Appleton Century Co., 1943. 375.2 Sm5

SOURCES CONSULTED

Card catalog of the Library of the Department of Agriculture, including the Entomology and Forest Service catalogs.

Card catalog of the Library of Congress, Division of Aeronautics.

Card catalog of the Library of the National Advisory Committee for Aeronautics.

Card catalogs of the Library of the National Institute of Health.

Aeronautical Chamber of Commerce of America, Inc. Library Bulletins No. 92, Apr. 15, 1929 — No. 215, Dec. 15, 1935. (Numbers 1–91 not available for examination.)

Agricultural Index, v. 1/3, 1916/1918 — v. 10, 1942/1945.

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Biological Abstracts, v. 1, 1926/1927 — v. 19, No. 10, December 1945.

Botanical Abstracts, v. 1, September 1918 — v. 15, July/November 1926.

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Experiment Station Record, v. 47, 1922 — v. 93, 1945.

Great Britain. Imperial Forestry Bureau. Forestry Abstracts, v. 1, 1939 — v. 7, No. 2, 1945.

Hoff, E. C., and Fulton, J. F. A Bibliography of Aviation Medicine. 237 pp. Springfield, Ill., Charles C. Thomas, 1942. (Historical Library, Yale Medical Library, Publication No. 5.) Aviation and Public Health (Sanitary Aviation), pp. 161–170.

Supplement. By P. M. Hoff, E. C. Hoff, and J. F. Fulton. 109 pp. Washington, published by the Committee on Aviation Medicine, Division of Medical Science, National Research Council, Acting for the Committee on Medical Research, Office of Scientific Research and Development, 1944. (Historical Library, Yale Medical Library, Publication No. 9.) Aviation and Public Health, pp. 62–65.

Index-Catalogue of the Library of the Surgeon General's Office, United States Army Medical Library, ser. 4, v. 1 (A)—v. 8 (I-J), 1936–1943; and card index of later material.

Index to the Literature of American Economic Entomology. Index II (1915/19)—Index VI (1935/39), 1921–1942; and card index for 1940/1944.

Industrial Arts Index, v. 1, 1913 — v. 33, No. 4, March 1945.

Korotkikh, G., and Rafes, P. Ukazatel' Literatury na Russkom i Natsional'nykh IAzykakh SSSR po Voprosam Primeneniia Aviatsii v Narodnom (Preimushchestvenno v Sel'skom i Lesnom) Khoziaĭstve za 1920–1935 g. [A Guide to the Literature That Has Appeared during the Years 1920–1935 in Russian and Other Languages of the USSR on the Use of Airplanes in the National Economy (Chiefly Agriculture and Forestry)]. 83 pp. Moscow, Ėkonom. Sekt. Komit. Ėkonom. i Prava Vozd. Flota TSS Osoaviakhima, Trudy. 1937.

London. Science Museum. Science Library. Use of Airplanes in the Control of Pests. 16 pp. 1936. (Bibliographical Series No. 278.)

McBath, W. E. A Bibliography on the Use of Airplanes in Insect Control from 1922 to 1933. 37 pp. Washington, D. C., U. S. Department of Agriculture, Bureau of Entomology. 1934.

Readers Guide to Periodical Literature, 1915/18 — v. 14, 1943/45.

Review of Applied Entomology, Ser. A, v. 1, 1913 — v. 33, pt. 12, December 1945; Ser. B, v. 1, 1913 — v. 33, pt. 12, December 1945.

Salmonsen, E. M. Airplanes vs. Transmission of Disease. 1 p. Chicago, 1942. (John Crerar Library Reference List No. 50.) Reproduced from typed copy.

Schmidt, Ingeborg. Bibliographie der Luftfahrtmedizin. 136 pp. Berlin, Julius Springer, 1938. Sect. 7, Sanitätswesen: Hygiene der Luftfahrt, pp. 125–136.

Zweite folge, 1937–1940. 127 & 1 p. Würzberg, Universitätsdruckerei, [1940]. (From Luftfahrtmedizin, Bd. 8.) Hygiene, Sanitätswesen, pp. 24–31.

Tropical Diseases Bulletin, v. 9, 1917 — v. 37, 1940; v. 40, 1943 — v. 42, No. 10, October 1945.

U. S. Advisory Committee for Aeronautics. Bibliography on Aeronautics. By Paul Brockett. 1909/1916, published 1921; 1917/1919 — 1932, published 1923–1936.

U. S. Superintendent of Documents. Catalog of the Public Documents . . . v. 15, July 1, 1919/June 30, 1921 — v. 25, 1939/1940. 1929–1945.

U. S. Superintendent of Documents. United States Government Publications. Monthly Catalog 1941–1945.

U. S. Works Progress Administration. Federal Works Agency. Bibliography of Aeronautics. Compiled from the Index of Aeronautics of the Institute of the Aeronautical Sciences. Pt. II—Medicine. Sanitary Aviation, pp. 90–96. Supplement, 1940. Sanitary Aviation, pp. 80–85.

Zentralblatt für Bakteriologie und Parasitenkunde. Abt. I Referate, v. 60, Dec. 12, 1913 — v. 139, June 3, 1941; v. 141, Jan. 10, 1942 — v. 145, No. 1/2, June 2, 1944.

BIBLIOGRAPHY ON AVIATION AND ECONOMIC ENTOMOLOGY

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1919

Anonymous. (1)

bee-farmer uses airplane. Sci. Amer. 121 (26): 639. Dec. 27, 1919. 470 Sci25

In order to avoid serious losses from spray poisoning, Nelson W. Peck of Yakima Valley, Wash., made several flights scouting for safe stands to which he could move his bees. He states that the expenditure of $75 saved him $1,000.

——— (2)

the captive balloon and the fruit grower. Sci. Amer. 125 (15): 372, illus. Oct. 11, 1919. 470 Sci25

Used to help raise fumigation tents.

Hewitt, C. G. (3)

the use of the aeroplane in entomological work. Agr. Gaz. Canada 6 (10): 877. October 1919. 7 C16G

Value has been demonstrated in surveying mosquito breeding areas and in estimating insect damage over large forest areas.

Moulton, R. H. (4)

army airplanes work to save forests. Amer. Thresherman and Farm Power 22 (7): 8–9, illus. November 1919. 58.8 Am32

Quoted in part *in* Lit. Digest 63 (12): 28, illus. Dec. 20, 1919. Libr. Cong.

Concerns forest-fire patrols and scouting for outlaw fields in areas where cotton-free zones have been established in the pink bollworm campaign.

1920

Davis, J. J. (5)

the green japanese beetle [popillia japonica] problem. Jour. Econ. Ent. 13 (2): 185–194. April 1920. 421 J822

Mentions use of the airplane to photograph and prepare mosaic of the area as an aid in planning clean-up work.

Moulton, R. H. (6)

the detective aeroplane. Travel 34 (4): 40, 54, illus. February 1920. Enoch Pratt Libr.

The airplane is used to aid in forest-fire patrols and to detect outlaw cotton fields in the campaign against the pink bollworm.

1921

Anonymous. (7)

aerial forest patrol extended; timber cruiser takes to the air; forest observers fight pests as well as fires; aircraft in mine rescue work. Aircraft Year Book 1921, pp. 34–43, illus. 333.8 Ai72

——— (8)

airplanes used for dusting orchards. Rural New-Yorker 80 (4663): 1295, illus. Nov. 5, 1921. 6 R88

Discusses possible use in orchard pest control and describes Ohio experiment against the catalpa sphinx, *Ceratomia catalpae.*

ANONYMOUS. (9)
SPRAYING TREES FROM AN AEROPLANE. Aerial Age Weekly 13 (25): 586. Aug. 29, 1921. 333.8 Ae8

Reprinted in part *in* Aviation 11 (10): 288. Sept. 5, 1921. 333.8 Av5
Ohio experiment against the catalpa sphinx.

SWAINE, J. M. (10)
A SURVEY OF OUR FORESTS FROM THE AIR. Agr. Gaz. Canada 8 (1): 20–22, illus. January 1921. 7 C16G

Survey included a study of spruce budworm (*Archips fumiferana*) infestation in northern Quebec and Ontario.

1922

ANONYMOUS. (11)
THE AIRPLANE AS THE CONQUEROR OF THE INSECT. Cur. Opinion 72 (5): 656–657, illus. May 1922. Libr. Cong.

Work of C. R. Neillie and J. S. Houser against the catalpa sphinx, *Ceratomia catalpae.*

——— (12)
AIRPLANE DUST SPRAY FOR COTTON. Pacific Rural Press 103 (9): 262. Mar. 4, 1922. 6 P112

Writer suggests that a 600-ft swath across entire boll-weevil front might check spread of the insect.

——— (13)
DRY-SPRAYING BY AEROPLANE. LESSONS OF THE FIRST EXPERIMENT. Fruit-Grower, Fruiterer, Florist & Market Gard. 54 (1389): 68. July 13, 1922. 80 F941

——— (14)
DUSTING TREES FROM AN AIRPLANE. Illus. Canad. Forestry Mag. 18 (2): 616. February 1922. 99.8 C16

Treats of the work of Houser and Neillie in Ohio.

——— (15)
FIGHTING INSECTS WITH AIRPLANES. Aerial Age Weekly 15 (3): 60, 67, 71. Mar. 27, 1922. 333.8 Ae8

Reprinted *in* Ace 3 (4): 6, 13. April 1922. Libr. Cong.
Deals with the Ohio dusting experiments against the catalpa sphinx.

——— (16)
LOCUST DESTRUCTION. THE DEPARTMENT'S WORK IN THE ERADICATION OF THE PEST. Union So. Africa. Dept. Agr. Jour. 4 (3): 233–235. March 1922. 24 Un3

Suggested use of airplanes against flying locusts considered impracticable.

——— (17)
POWDER SPRAYING BY AEROPLANE. Fruit-Grower, Fruiterer, Florist & Market Gard. 53 (1387): 1137, illus. June 29, 1922. 80 F941

An account of the first airplane-dusting experiment in Great Britain. The test was made to control caterpillars of the tortrix moth in an 18-acre cherry orchard on Portobello Farm, Kingsdown, England, owned by Major R. F. Bartlett. Work was done by the Daimler Air Line, using a passenger-type plane, DH 34, flown at about 20 yd. above the tree tops. The dust was specially prepared by W. J. Craven & Co. of Evesham, but is not further identified.

——— (18)
SPRAYING FRUIT TREES FROM THE AIR. Flight 14 (25): 359. June 22, 1922. Libr. Cong.

——— (19)
SPRAYING TREES FROM THE AIR. Sci. Amer. 126 (5): 333, illus. May 1922. 470 Sci25

Refers to Ohio experiment of Neillie and Houser against the catalpa sphinx.

CORKINS, C. L. (20)
NOTES ON THE MIGRATION OF MELANOPLUS ATLANIS RILEY IN NORTHERN NORTH DAKOTA IN 1920. OBSERVATIONS IN BOTTINEAU AND RENVILLE COUNTIES. Canad. Ent. 54 (1): 1–4. January 1922. 421 C16

"Data on the altitude of flight was taken . . . in an airplane. The swarm was found to be densest at 500 to 800 feet." A few individuals were found at 1,650 ft.

HASKIN, F. (21)
GASSING BUGS FROM AN AIRPLANE. Fla. Grower 25 (11): 6, 21. Mar. 18, 1922. 80 F6622

Cites the use of the airplane against the catalpa sphinx at Troy, Ohio, and against the boll weevil at Tallulah, La.

HEARLE, E. (22)
AN AERIAL SURVEY OF MOSQUITO BREEDING PLACES. Agr. Gaz. Canada 9 (3): 191–195, illus. May/June 1922. 7 C16G

Cooperative survey between the Dominion Entomological Branch and the Canadian Air Board over the Lower Fraser Valley, B. C., which proved of great value in mapping breeding areas. There are about 28,000 acres of temporary flood-water, when the river is at a 21-foot level, which provide suitable areas for mass breeding of *Aedes aldrichi* and *A. vexans*.

HOUSER, J. S. (23)
THE AIRPLANE IN CATALPA SPHINX [CERATOMIA CATALPAE] CONTROL. Ohio Agr. Expt. Sta. Monthly Bul. 7 (7/8): 126–136, illus. July/August 1922. 100 Oh3S

Gives brief description of the insect and its life history. Describes apparatus used and details of applying dust to a catalpa grove measuring 325 by 800 ft., with trees from 25 to 30 ft. high. In six flights over the grove 175 lb. of lead arsenate were used, and thus more work was accomplished in 54 seconds than could have been done with a liquid sprayer in many hours. Although at least 99 percent of the caterpillars were killed, it was concluded that treatment should have been started earlier before any of brood had pupated in the ground.

——— (24)
THE AIRPLANE IN FOREST INSECT CONTROL. Amer. Pomol. Soc. Proc. (1921) 38: 329-333, illus. 1922. 81 Am33

Description of the dusting of a catalpa grove at Troy, Ohio.

NEILLIE, C. R., and HOUSER, J. S. (25)
FIGHTING INSECTS WITH AIRPLANES: AN ACCOUNT OF THE SUCCESSFUL USE OF THE FLYING-MACHINE IN DUSTING TALL TREES INFESTED WITH LEAF-EATING CATERPILLARS [CERATOMIA CATALPAE]. Natl. Geog. Mag. 41 (3): 333–338, illus. March 1922. 470 N213

Condensed *in* Cur. Opinion 72: 656–657. May 1922. Libr. Cong.

SWAINE, J. M. (26)
THE SPRUCE BUDWORM [ARCHIPS FUMIFERANA] IN QUEBEC PROVINCE. Quebec Soc. Protect. Plants. Ann. Rpt. (1921/22) 14: 32–39. 1922. 464.9 Q3

Includes mention of a hydroplane survey of the region, which was carried out to determine area affected. Also discusses possibility of applying dusts from airplanes.

UNITED STATES CONGRESS. HOUSE. COMMITTEE ON AGRICULTURE. (27)
USE OF AIRCRAFT. HEARINGS . . . SIXTY-SEVENTH CONGRESS, SECOND SESSION, FEB. 8, 1922. Serial R. 12 pp. Washington, [D. C.], U. S. Govt. Print. Off., 1922. 423 Un3U

Statements of J. A. Truesdell and L. O. Howard on the use of airplanes in dusting cotton fields to destroy the boll weevil.

WILLIAMS, C. G. (28)
THE AIRPLANE IN FOREST INSECT CONTROL. Ohio Agr. Expt. Sta. Ann. Rpt. (1921/22) 41 (Bul. 362): XXXII–XXXV, illus. Wooster, 1922. 100 Oh3S

Summary of experiments against the catalpa sphinx (*Ceratomia catalpae*) and cankerworm (*Anisopteryx*), using lead arsenate. First use of the airplane to control insects attacking tall trees.

1923

ANONYMOUS. (29)
AIRPLANES IN THE DEPARTMENT OF AGRICULTURE. Aerial Age 16 (5): 246–247. May 1923. 333.8 Ae8

Reviews various uses, including crop dusting, from 1919 to 1922; gives details of Ohio experiment against the catalpa moth.

——— (30)
DISTRIBUTION OF INSECTICIDES BY AIRPLANE. Union of So. Africa. Dept. Agr. Jour. 6 (5): 386. May 1923. 24 Un3

Quotes R. O. Wahl on the Ohio experiment against the catalpa sphinx.

——— (31)
FIGHTING BOLL WEEVIL BY MEANS OF AIRPLANES. ARMY AIR SERVICE AND DEPARTMENT OF AGRICULTURE COOPERATE IN AERIAL EXTERMINATION CAMPAIGN. Aviation 15 (8): 210–212, illus. Aug. 20, 1923. Libr. Cong.

Refers to tests at Tallulah, La.

——— (32)
POISONING THE WEEVIL. DUSTING PLANES MOST PROMISING MEANS CONTROL. Textile World 64 (26): 3897–3898. Dec. 29, 1923. 304.8 T315

BURGESS, A. F., and others. (33)
EXPERIMENTS IN DUSTING FOREST AREAS WITH AN AIRPLANE. DISCUSSION OF PAPER. Jour. Econ. Ent. 16 (3): 249–251. June 1923. 421 J822

The original paper by A. F. Burgess, which discussed measures against the gypsy moth, was withdrawn from publication. The discussion, by W. E. Britton, A. F. Burgess, J. M. Swaine, E. P. Felt, J. S. Houser, and D. F. Barnes, brings out various points on airplane-dusting problems.

GOCO, A. (34)
INSECTICIDES FOR LOCUST EXTERMINATION. Philippine Agr. Rev. 16 (1): 49–54, illus. 1923. 25 P54P

Recommends that, wherever possible, breeding places should be located by airplane and dusted with white arsenic and calcium arsenate. With this method seeds of quick-growing forest trees might be scattered at the same time.

HELLER, H. (35)
FLUGZEUGE ZUR INSEKTENBEKÄMPFUNG. Umschau 27 (8): 123, illus. Feb. 24, 1923. 474 Um7

Note on Ohio work against the catalpa sphinx.

HOUSER, J. S. (36)
DUSTING TALL TREES BY AIRPLANE FOR LEAF EATING INSECTS. Jour. Econ. Ent. 16 (3): 241–249. June 1923. 421 J822

Two experiments were conducted in Ohio: one on cankerworms (*Anisopteryx*) over 30 acres of mixed woodland and one on the catalpa sphinx (*Ceratomia catalpae*) over a 4-acre catalpa grove. The dust was about 4 min. in settling and covered the leaves well, even to the ground level. Airplane dusting, it was found, avoids mechanical injury to the plants. In the second test, only about half of the dust used settled on the trees, but results were considered good. Modification of the dust releaser to make its action more effective, was suggested.

MORAN, C. (37)
WAR ON THE BOLLWEEVIL. U. S. Air Serv. 8 (12): 54–55, illus. December 1923. Natl. Advisory Com. for Aeronaut. Libr.

Boll-weevil control and other agricultural uses of the airplane are discussed.

MORSE, A. L. (38)
REPORT ON AIRPLANE DUSTING CONDUCTED AT TALLULAH, LA., DURING THE SUMMER OF 1923. 8 pp., illus. Dayton, Ohio, U. S. War Department, Air Service, Engineering Division, McCook Field, 1923. [Processed.] Natl. Advisory Com. for Aeronaut. Libr.

The purpose of the experiment was to develop satisfactory dusting apparatus for the DH–4B airplane. Gives details of apparatus and its installation, with diagrams and photographs.

UPHOF, I. C. T. (39)
DIE MODERNE INSEKTENBEKÄMPFUNG IN DEN VEREINIGTEN STAATEN. Ztschr. f. Angew. Ent. 9: 350–352, illus. June 1923. 421 Z36
Includes discussion of airplane dusting, with especial reference to the Ohio experiment by Neillie and Houser against the catalpa sphinx.

ZIMMERMAN. (40)
FLUGZEUGE ZUR INSEKTENBEKÄMPFUNG. Umschau 27 (11): 173–174. Mar. 17, 1923. 474 Um7
Refers to patents issued to him, on the use of the airplane in insect control, which antedate the Ohio experiments by Neillie.

1924

ANONYMOUS. (41)
AEROPLANE A SUCCESS AS A BOLL-WEEVIL DUSTER. Mfrs. Rec. 86 (10): 100. Sept. 4, 1924. 297.8 M31
Account of demonstration at Athens, Ga.

——— (42)
AIRPLANE DUSTS POISON. Val. Farmer and Citrus Grower 2 (3): 16. May 1924. 6 V242
Mosquito control near Mound, La.

——— (43)
AIRPLANES AND AIRSHIPS "PUT TO WORK" COMBATING COTTON BOLL WEEVIL, GYPSY MOTH AND LOCUST—ASSURANCE OF SAVING AGRICULTURE MILLIONS OF DOLLARS—PROSPECTIVE SERVICE IN CROP ESTIMATING. Aircraft Year Book 1924, pp. 75–83, illus. 333.8 Ai72

——— (44)
AIRPLANES COMBAT LOCUST PLAGUE. U. S. Air Serv. 9 (7): 20. July 1924. Natl. Advisory Com. for Aeronaut. Libr.
Deals with experiments at San José, Mindoro, Philippine Islands. This was a cooperative project between the U. S. Army Air Service, the Philippine Trust Co. (Trustee Mindoro Sugar Co.), and the Civil Government of the Islands.

——— (45)
ATTACKING MALARIA WITH AIRPLANES. Sci. Amer. 131 (6): 404. December 1924. 470 Sci25
Refers to work of Dr. W. V. King at Mound, La.

——— (46)
BALLOONS TO STUDY THE SPREAD OF INSECTS. Science 59 (1532, sup.): XII. May 9, 1924. 470 Sci2

——— (47)
FIGHTING INSECTS FROM THE AIR. Amer. Fruit Grower Mag. 44 (6): 14. June 1924. 80 G85
Refers to the use of small dirigibles of the Zeppelin type. A crew of several men, free to move about, can handle dusting machinery more conveniently. Danger to machine from a forced landing is nonexistent.

——— (48)
THE LATEST WARFARE IN THE AIR. Forecast [N. Y.] 28 (1): 31, 67, illus. July 1924. 321.8 F76
Quoted *in* Lit. Digest 83(1808): 61–62, Dec. 13, 1924, under title Aerial Warfare on Insects up to Date. Libr. Cong.
Refers to airplane dusting for the boll weevil and mosquitoes.

*BOLDYREV, V. F. (49)
O PRIMENENII SAMOLETOV PRI BOR'BE S VREDITELÎAMI [THE USE OF AIRPLANES IN THE CONTROL OF PESTS]. 33 pp. Izd. "Novaîa Derevnîa" M., 1924. [In Russian.]
The Korotkikh and Rafes bibliography (p. iv) cites this on p. 33.

CLAYTON, J. E. (50)
KILLING BOLL WEEVILS AND MOSQUITOES BY AIRPLANE ACTIVITIES.—HOW AIRPLANES ARE BEING USED TO MEASURE COTTON ACREAGE AND TO DUST CALCIUM ARSENATE OVER BOLL WEEVILS AND MOSQUITOES. Mfrs. Rec. 86 (23): 89–90. Dec. 4, 1924. 297.8 M31

COAD, B. R., JOHNSON, E., and MCNEIL, G. L. (51).
DUSTING COTTON FROM AIRPLANES. U. S. Dept. Agr. Bul. 1204, 40 pp., illus. Washington, D. C., 1924. 1 Ag84B

Experiments in the use of airplanes for control of *Alabama argillacea* and *Anthonomus grandis* were conducted near Tallulah, La. The plane was a Curtiss JM6H, and 3 types of hoppers were tested: hand-operated, air-suction, and the Dayton hopper. Photographic mosaic maps made from the plane were not available until almost the end of test, although a constant need for them was felt in planning the day's work. Studies were made of the behavior of the dust cloud, the influence of air conditions, and the adhesion of the dust to the plants. The insecticides tested were the various makes of calcium arsenate, lead arsenate, and paris green. *Alabama argillacea* required less poison than when ground machines were used. The airplane, if it has a firm landing field, is not hampered by a soggy condition of the cotton fields, which would prohibit the use of ground dusters. These tests were not felt to be conclusive, but they did show that dust could be applied from the air and that it would adhere under daytime conditions. This method of control must be a cooperative project.

DACY, G. H. (52)
UNCLE SAM USES AIRPLANES AGAINST DESTRUCTIVE INSECTS. St. Nicholas 51 (10): 1064–1067, illus. August 1924. Libr. Cong.

Control of cotton insects and mosquitoes.

ECKSTEIN. (53)
ZUR GESCHICHTE DER BEKÄMPFUNG SCHÄDLICHER INSEKTEN IM WALDE. Forstl. Wchnschr. Silva 12 (30): 235–236. July 25, 1924. Harvard Univ. Arnold Arboretum Libr.

Refers to Escherich's article (item 54) describing airplane dusting in America and states that once more Americans have used German ideas for practical purposes, as it was a German forester who first thought of destroying insect pests in the tree tops. Also describes spraying and dusting by airplane.

ESCHERICH, K. (54)
NOCH EINIGE WORTE ZUR NONNENBEKÄMPFUNG. Forstl. Wchnschr. Silva 12 (27): [209]–210, illus. July 4, 1924. Harvard Univ. Arnold Arboretum Libr.

Suggests airplane dusting as the most effective method for control of *Lymantria monacha*. Cites article by Uphof (item 39), and erroneously places the Ohio catalpa moth experiment in Florida.

MCDARMENT, C. (55)
THE USE OF AIRPLANES TO DESTROY THE BOLL WEEVIL. McClure's Mag. 57 (4): 90–102, illus. August 1924. Libr. Cong.

Well-illustrated, popular article on airplane dusting from the inception of the experiments in 1918.

MALLY, C. W. (56)
THE EUCALYPTUS SNOUT-BEETLE (GONIPTERUS SCUTELLATUS, GYLL.). So. Africa Dept. Agr. Jour. 9 (5): 415–442, illus. November 1924. 24 Un3

Suggests use of airplane to distribute arsenical dusts. No study was made.

POST, G. B. (57)
BOLL WEEVIL [ANTHONOMUS GRANDIS] CONTROL BY AIRPLANE. Ga. Agr. Col. Bul. 301, 22 pp., illus. Athens, 1924. 276 G29B.

Sets forth the following advantages of dusting by airplane: (1) Saves 50 to 60 percent in amount of calcium arsenate needed; (2) eliminates night operations, since efficiency is not affected by day winds or lack of dew; (3) can be used when the fields are muddy; (4) 200 to 1,000 acres can be dusted per hr. as against 30 acres per day for carts; (5) newly discovered infestations can be controlled in a few hours instead of several days; (6) reduced time spent in dusting will allow 33 percent more cotton to be raised; (7) one plane will do the work of from 50 to 75 cart dusters and cost less; (8) mobility of the airplane makes it promptly available at any spot required. The article also gives the early history and development of airplane dusting, the principles

involved, types of machines used, and directions for organizing an operating company.

S. (58)
DAS FLUGZEUG ALS HILFSMITTEL ZUR VERTILGUNG VON FORSTINSEKTEN. Deut. Forst-Ztg. 39 (48): 1134. Nov. 28, 1924. 99.8 D48.

Discusses development of an airplane dusting apparatus for use in the eradication of forest insects, and the first test made by Dr. Maag on Oct. 28, 1924, at Dielsdorf. In this preliminary test no poison was mixed with the dust.

SWAINE, J. M., and CRAIGHEAD, F. C. (59)
STUDIES ON THE SPRUCE BUDWORM [ARCHIPS FUMIFERANA CLEM.]. Canada. Dept. Agr. Bul. (n. s.) 37 (Ent. Bul. 25), 91 pp., illus. Ottawa, 1924. 7 C16B.

Aeroplane Survey of the Timiskaming Region, pp. 11–13. Also refers to possibility of spraying or dusting from airplanes, p. 88. References.

UNITED STATES DEPARTMENT OF AGRICULTURE. (60)
POISON PLANES MOST PROMISING MEANS OF CONTROLLING BOLL WEEVIL. Aeronaut. Digest 4 (2): 151–152. February 1924. Natl. Advisory Com. for Aeronaut. Libr.

Refers to work of B. R. Coad at Tallulah, La., and brings out need for special planes and equipment. Calcium arsenate is stated to have been the best insecticide known at the time.

V[AYSSIÈRE], P. (61)
L'AVIATION CONTRE LES INSECTES DU COTON. Agron. Colon. Ann. 11 (81): 87–89. September 1924. 26 Ag81.

Reviews American work (item 51).

*WOLFF, M., and KRAUSSE, A. (62)
ÜBER DIE BEKÄMPFUNG VON FORSTSCHÄDLINGEN MIT ARSENPRÄPARATEN VOM FLUGZEUG AUS. Prussia. Min. f. Landw. Domänen u. Forsten. Forstl. Flugbl. 4, 4 pp. Neudamm, J. Neumann, 1924.

A publication intended to answer objections to the practical use of arsenical dusting by airplane in plant protection. Refers to experiences in America and in the German wine-growing districts which refute the claim that arsenicals cannot be safely used.—Abstract *in* Allgem. Forst- u. Jagd.-Ztg. 102: 379. 1926.

1925

ANONYMOUS. (63)
AEROPLANE WINS FRIENDS AMONG CRANBERRY GROWERS. N. J. Agr. 7 (10): 13, 15, illus. October 1925. 275.28 N46.

——— (64)
AIRPLANE DUSTING OF COTTON LEADS TO VARIOUS NEW STUDIES. Val. Farmer and Citrus Grower 3 (1): 19. March 1925. 6 V242

Cooperative work by the Bureau of Public Roads and the Bureau of Standards on the nature of the electrical charge imparted to discharged dust particles. Also refers to studies on planes, apparatus, and types of calcium arsenate.

——— (65)
COTTON DUSTING BY AIRPLANE. Amer. Fert. 62 (8): 68, 70. Apr. 18, 1925. 57.8 Am3

Since the experimental stage has been passed, a demonstration on a commercial basis is being arranged by the Delta Laboratory of the U. S. Bureau of Entomology, the Georgia State Board of Agriculture, and the Georgia State Board of Health.

——— (66)
ERFOLGREICHE BEKÄMPFUNG DER FORLEULE UND NONNE IM JUNI 1925. Deut. Forst-Ztg. 40 (27): 654. July 3, 1925. 99.8 D48

Airplane application of a finely powdered calcium arsenate preparation proved effective against *Panolis flammea* and *Lymantria monacha*.

——— (67)
FIGHTING PESTS BY AIRCRAFT. Facts about Sugar 20 (33): 787, illus. Aug. 15, 1925. 65.8 F11

Describes and illustrates dusting hopper and dust atomizer developed by Alan L. Morse.

——— (68)
FORSTSCHÄDLINGSBEKÄMPFUNG DURCH FLUGZEUGE. Deut. Forst-Ztg. 40 (33): 793–795. Aug. 14, 1925. 99.8 D48

Condensed form *in* Automobil-Motorrad-Flugwesen 7(15): 414–415, illus. Aug. 15, 1925. Libr. Cong.

A successful experiment, using various calcium arsenate dusts, was made against *Panolis flammea* and *Lymantria monacha* in the Biesenthal Forest, Prussia. The plane used was an Aero-Lloyd, Typ. Fokker F II.

——— (69)
NEW DUSTING APPARATUS SUCCESSFUL. Slipstream 6 (8): 16–17, illus. August 1925. Natl. Advisory Com. for Aeronaut. Libr.

Description and illustration of the A. L. Morse detachable dusting hopper, installed in a Curtiss "Jenny." Tests were made at Dayton, Ohio, and Mitchell, Ind.

——— (70)
POISON SPRAYING. Sci. Amer. 133 (4): 273–274, illus. October 1925. 470 Sci25

Spraying by airplane and dirigible.

BERL, C. W. (71)
CROP PROTECTION BY AIRPLANE DUSTER, AN INTERESTING DEVELOPMENT IN THE FIGHT AGAINST THE BOLL WEEVIL AND OTHER INSECT PESTS. Mfrs. Rec. 88 (2): 92–93, illus. July 9, 1925. 297.8 M31

Credits B. R. Coad of the U. S. Bureau of Entomology, Delta Laboratory, with the idea of dusting cotton by airplane. Huff, Daland & Co. cooperated in the development of a suitable plane. Describes the plane and its special equipment.

DEMUTH, W. (72)
DIE VERWENDUNG DES FLUGZEUGES BEI DER BEKÄMPFUNG SCHÄDLICHER FORST-INSEKTEN. Deut. Forstwirt 7 (85): 764–765. July 29, 1925. Duke Univ. Libr.

Discusses the difficulties inherent in handling a heavier-than-air craft, which cannot safely fly below a minimum speed, in the control of injurious forest insects.

EBERT. (73)
ENDGÜLTIGES ÜBER DEN NONNENKAMPF IM SORAUER WALDE. Deut. Forstwirt 7 (93): 860–861. Aug. 26, 1925. Duke Univ. Libr.

On the nun moth campaign in the Sorau Forest.

Discusses effect of calcium arsenate on birds and bees. States that the dosage required must be especially determined for each species of insect and that much information has been gained in regard to costs.

——— (74)
DER ERSTE FLUGZEUG-GROSSKAMPF GEGEN DIE NONNE [LYMANTRIA MONACHA]. Deut. Forstwirt 7 (76): 653–654. June 27, 1925. Duke Univ. Libr.

Work with calcium arsenate in Sorau District.

See also his note in same journal (7 (83): 732. July 22, 1925) under title Zur Nonnenbekämpfung vom Flugzeug aus.

EIDMANN, H. (75)
DAS FLUGZEUG ALS HILFSMITTEL ZUR VERTILGUNG VON FORSTINSEKTEN. Anz. f. Schädlingsk. 1 (3): 46. Apr. 15, 1925. 421 An9

Quoted, with comments, from the article signed "S" (item 58).

Reviews papers by K. Escherich on work in Bayern.

ESCHERICH, K. (76)
DIE FLUGZEUGBEKÄMPFUNG DES KIEFERNSPANNERS [BUPALUS PINIARIUS] IN BAYERN. Anz. f. Schädlingsk. 1: 142. Dec. 15, 1925. 421 An9

Brief note on the work in the Bayern forests.

——— (77)
EINE REISE INS NORDDEUTSCHE EULENGEBIET. I–II. Forstwiss. Centbl. 69 (1): [2]–20. Jan. 1, 1925; (2): 53–67, illus. Jan. 15, 1925. 99.8 F775

Life history, control, and damage done by *Panolis flammea*. Airplane control discussed on pp. 64–67.

FISCHER, E. G. (78)
AIRPLANE COMES TO FARMERS' RESCUE. Power Farming 34 (11): [5], illus. November 1925. 58.8 T41

Refers to boll-weevil control.

FROTSCHER, W. (79)
EIN GROSSES BIENENSTERBEN UND SEINE WAHRSCHEINLICHE URSACHE. Märkische Bienen-Ztg. 15 (8): 143–144. August 1925. 424.8 M45

Also *in* Biene u. ihre Zucht 62(9): 241–242. September 1925. 424.8 B478; Leipzig. Bienen Ztg. 40 (10): 220–221. October 1925. 424.8 L53

Effect on bees of airplane dusting against *Lymantria monacha* in the Sorau region during May 1925.

FRYER, J. C. F. (80)
REPORT ON THE OCCURRENCE OF INSECT PESTS ON CROPS IN ENGLAND AND WALES FOR THE YEARS 1922, 1923, AND 1924. Gt. Brit. Min. Agr. and Fisheries. Misc. Pub. 49, 35 pp. London, 1925. 10 G79M

Airplane dusting not suited to orchards in England because of mixed nature of crops, small areas, and unreliable climate. Might be useful in large areas to be treated in short space of time.

GNESSIN, V. F. (81)
BOR'BA S VREDNYMI NASEKOMYMI PRI POMOSHCHI AEROPLANA [CONTROL OF HARMFUL INSECTS BY AIRPLANE]. Amer. Tekh. 2 (10): 20–23, illus. October 1925. [In Russian.] Libr. Cong.

Gives summary of the control of cotton pests by ground equipment in the United States prior to 1921, when the airplane was first utilized in Ohio in the control of *Ceratomia catalpae*. Also refers to the experiments carried out at Tallulah, La., in 1922 and to the progress made in the use of airplanes in the extermination of various insects. Type of insecticide used is very important to the success of an operation.

HINDS, W. E., SPENCER, H., and JACKSON, S. (82)
DEPARTMENT OF ENTOMOLOGY. La. Agr. Expt. Sta. Ann. Rpt. 1925: 19–27. Baton Rouge. 100 L93

Commercial dusting of cotton with calcium arsenate on a large scale was first undertaken in Louisiana in 1925 by Huff-Daland Dusters, Inc., and appeared practical. Calcium arsenate proved disappointing against *Diatraea saccharalis*, but more promising results were obtained with sodium fluoscilicate. Larval kill was more than 90 percent, and the killing effect persisted for several days. No serious burning of the canes resulted. (Pp. 21–22, 24–25.)

HOWARD, L. O. (83)
MOSQUITO WORK DURING THE YEAR 1924. N. J. Mosquito Extermin. Assoc. Proc. (1925) 12: 6–16. 420 N46

Refers to work of Dr. W. V. King in Louisiana (1923 and 1924) with airplane dusting against mosquito larvae (pp. 13–14).

KING, W. V., and BRADLEY, G. H. (84)
AIRPLANE DUSTING CONTROLS MALARIA MOSQUITOES. Aero Digest 7 (6): 652–653, 688, illus. 1925. Libr. Cong.

Account of operations of the U. S. Bureau of Entomology at Mound, La., and of the U. S. Public Health Service near Lake City, Fla. Includes discussion on cost of application.

KLEMIN, A. (85)
LEARNING TO USE OUR WINGS. POISON SPRAYING. Sci. Amer. 133 (4): 273–274, illus. October 1925. 470 Sci25

Spraying by airplane and dirigible.

KOROTKIKH, [G. I.] (86)
AVIATSIIA V SEL'SKOM KHOZIAĬSTVE [AVIATION IN AGRICULTURE]. Samolet 2 (1): 15–16, illus. January 1925. [In Russian.] Libr. of Cong.

In 1921 Narkomzem experimented with spraying from airplanes, and in 1924, following American practice, used the dusting method. One airplane can dust 30 dessiatines (81 acres) in a minute. The article discusses the advantages of airplane dusting, especially in control of locusts in the reed beds.

——— (87)
NA NOVOM FRONTE (RABOTA AVIATSIONNOĬ ĖKSPEDITSII PO BOR'BE S SARANCHEĬ NA SEVERNOM KAVKAZE) [ON A NEW FRONT (WORK OF THE AVIATION EXPEDITION IN LOCUST CONTROL IN THE NORTHERN CAUCASUS]. Samolet 2 (9): 37–38, illus. September 1925. [In Russian.] Libr. Cong.

Experimental dusting was carried out against *Locusta migratoria* in the reed beds of the River Kuma, northern Caucasus, by the Commissariat of Agriculture in cooperation with the Air Force. The poison remained on the plants and retained its toxicity for 2 or 3 days. Penetration into dense vegetation was complete and high mortality was observed when 10 to 12 lb. of paris green or sodium arsenate were applied. A total of 2,700 acres were dusted, one plane covering about 2.7 acres in an hour's flight. The method was found most effective against the hoppers. Adults could be dusted only in the morning, as later in the day they were disturbed easily and took flight, choking the radiators of the plane. Workmen suffered some ill effects, and the airmen had to use respirators.

——— (88)
SAMOLET NA BOR'BU S VREDITELIAMI (PERVAIA V SSSR ĖKSPEDITSIIA NA SEVERNYĬ KAVKAZ) [AIRPLANE IN THE CONTROL OF PESTS (1ST EXPEDITION TO NORTH CAUCASUS)]. Samolet 2 (6/7): 59–60. June/July 1925. [In Russian.] Libr. Cong.

KRIEG, [H.] (89)
DIE BEKÄMPFUNG FORSTLICHER SCHÄDLINGE DURCH ABWURF VON CALZIUM ARSENIAT VOM FLUGZEUG. Anz. f. Schädlingsk. 1 (9): 97–98. Sept. 15, 1925. 421 An9

An account of dusting operations over 600 acres of mixed forest in Germany infested with larvae of the nun moth, *Lymantria monacha*. About 26 lb. of calcium arsenate were used per acre. All caterpillars died in 5 to 6 days. Since the nun moth is very resistant to insecticides, it might be possible to reduce amount for other insects. No injurious effects on game or birds were noticed. Warnings were issued against picking berries or mushrooms in dusted areas.

KRUTZSCH. (90)
DAS LUFTBILD IM DIENSTE DER FORSTEINRICHTUNG. Tharandter Forstl. Jahrb. 76 (3): 97–150, illus. 1925. 99.8 T32

Discusses the best instruments and most satisfactory methods for taking aerial photographs.

MCDARMENT, C. (91)
MILLIONS SAVED BY THE POISON DROPPER. Motor Life 20 (3): 5–7, 48, illus. March 1925. Libr. Cong.

Describes the airplane dusting experiments of 1923, a cooperative project between the U. S. Bureau of Entomology and the Army Air Service. Discusses advantages and costs. Illustrations show planes, aerial photographs of infested areas, dusting hopper, dust cloud, and Air Force pilots.

MORSE, A. L. (92)
AERONAUTICS AND AGRICULTURE; HOW BILLIONS WILL BE SAVED IN FORESTS AND CROPS BY UNIQUE BUT HIGHLY PRACTICAL AIRCRAFT DUSTING APPARATUS. Slipstream 6 (4): 5–8, illus. April 1925. Natl. Advisory Com. for Aeronaut. Libr.

Cites annual losses in United States caused by insects, and discusses advantages of airplane dusting. Gives diagram of dusting hopper, and describes its action.

———— (93)
THE AIRPLANE FLIES TO THE AID OF HORTICULTURE. Hoosier Hort. 7 (11): 163–170, illus. November 1925. 81 In2H

Cites use against the codling moth and cranberry pests; gives brief historical account; summarizes problems and general principles of dusting; describes apparatus (hopper, Venturi tube, agitator); states service which the Morse Agricultural Service, Inc. is prepared to offer.

MORSE, S. F. (94)
AIRPLANE DUSTING FOR CRANBERRY PEST CONTROL. Amer. Cranberry Growers' Assoc. Proc. Ann. Conv. (1925) 56: 4–5, 8, illus. 81 Am35C

A plane can dust from 500 to 2,000 acres a day, and the cost is less than when ground spraying is used. The injury to soil and plants caused by a moving hose is eliminated. The author recommends that the growers form cooperative groups.

NIKOL'SKIĬ, V. V. (95)
AZIATSKAÎA SARANCHA, LOCUSTA MIGRATORIA [ASIATIC LOCUST, LOCUSTA MIGRATORIA]. Gosud. Inst. Opytn. Agron. Otd. Prikl. Ent., Trudy, v. 12, No. 2, 330 pp., illus. Leningrad, 1925. [In Russian.] 420 R922

Transactions of the State Institute of Experimental Agronomy, Department of Applied Entomology.

Experiments in airplane spraying were made in the Moscow district in 1922, using planes of the Voisin type equipped with Salmson motors and the Automax sprayer of K. Platz Company. To determine the altitude required for successful spraying, long strips of paper were placed on level ground over which the airplanes passed at heights of ½–1, 1½–3, 4–5, 10, 15 m., etc. until they reached altitudes of 500 and 600 m. Satisfactory fall and spreading of the spray was obtained at 10 to 15 m., but the best results were with the Vermorel nozzle used at a pressure of 5 atmospheres and altitudes of 4 to 6 m. Although tests were made with several arsenicals, paris green was most frequently used. A signal system worked out for communication between the ground crews and the pilots is described.

ORLOVIUS. (96)
EINIGE TECHNISCHE BETRACHTUNGEN ÜBER DIE FLUGZEUGBESTÄUBUNG. Deut. Forstwirt 7 (91): 835–836. Aug. 19, 1925. Duke Univ. Libr.

Refers to experiments with calcium arsenate dusts against *Lymantria monacha* and noctuid moths. Discusses effects of the poison, which resulted in death of the insects within 2 to 5 days. No injury was caused to workmen loading plane, to aviators, or to animals. Describes dusting apparatus used, methods of application, effects of wind and weather, and other factors.

PENDLETON, R. L. (97)
AIRPLANE CONTROL OF INSECTS, PARTICULARLY OF LOCUSTS IN THE PHILIPPINE ISLANDS. Sugar News 6 (4): 186–193, illus. April 1925. 65.8 Su36

Reviews conclusion reached by the U. S. Army Air Service in unpublished reports on experiments carried out in Mindoro. Calcium arsenate (14 lb. per 2½ acres) will kill all hoppers over 4 days old and all fliers if it is applied to vegetation after the insects have settled for the night. Difficulties experienced were largely caused by the use of Army planes unsuited to the work. Lists 13 points desirable in a dusting plane. Gives detailed discussion of costs involved in installing an adequate dusting service.

References.

PRELL, H. (98)
NEUE GEFAHREN FÜR DIE DEUTSCHE BIENENZUCHT. SCHÄDLINGSBEKÄMPFUNGSMITTEL ALS BIENENVERNICHTER. Kranke Pflanze 2(11): 242–246. November 1925; 3 (1): 11–12. January 1926. 464.8 K86

The second part of the article refers to airplane dusting.

Airplane dusting was carried out against *Lymantria monacha* in Schlesien in 1925 over a mixed forest area. The calcium arsenate used proved effective but caused a high mortality to bees. An apiary adjacent to the dusted area lost 150 colonies, the bees continuing to die for many weeks because of the poison stored in the pollen. Although arsenic was carried in the pollen, it was not found in the honey gathered. The danger to the bee industry in

Germany is not great, however, because the high cost of application and the limited area of infestation by forest insects makes this method less likely to be employed. Beekeepers should be warned beforehand in order that they may confine their bees or move them until the danger is past.

——— (99)
ZUR GESCHICHTE DER FORSTSCHÄDLINGSBEKÄMPFUNG VOM FLUGZEUGE AUS. Anz. f. Schädlinsk. 1 (12): 141–142. Dec. 15, 1925. 421 An9

Historical account of use of aircraft against forest pests.

RAUMER, H. VON. (100)
VERWENDBARKEIT DES FLUGZEUGES. Deut. Forstwirt 7 (91): 834–835. Aug. 19, 1925. Duke Univ. Libr.

States that use of the airplanes enables the forester and the farmer to work in 3 dimensions. Discusses its value in making forest surveys and photographic records. Also reviews work done in control of insect pests and mentions prospects for the future.

RIIS, R. W. (101)
COMMERCIAL CROP DUSTING. DETAILS OF THE OPERATIONS OF THE HUFF DALAND DUSTERS. Aviation 18 (21): 573, illus. May 25, 1925. Libr. Cong.

RUDY, H. (102)
DIE FLUGZEUGE IM DIENSTE DER BEKÄMPFUNG LANDWIRTSCHAFTLICHSCHÄDLICHER INSEKTEN IM STAATSGEBIETE DER SSSR. Bad. Bl. f. Schädlingsbekämpf. 1 (5): 68–70. June 1925. 421 B14

Reports on large-scale dusting operations with airplanes in Russian Turkestan in 1924. Planes flying at 50 to 100 ft. above the ground dusted over 28,000 sq. yd. in an hr., including stops for refilling dust containers. The most serious pest in this region is *Locusta migratoria*, which breeds in inaccessible marshy areas. Airplane dusting appears to offer the solution to the control problem.

SACHTLEBEN, H. (103)
FORSTSCHÄDLINGSBEKÄMPFUNG VOM FLUGZEUG AUS. Nachrichtenbl. f. den Deut. Pflanzenschutzdienst 5 (9): 73. September 1925. 464.9 N11

Describes airplane dusting with calcium arsenate to control insects attacking the forests of Biesenthal and Sorau and other forests in Germany.

STEELE, W. M. (104)
AIRPLANE WAR AGAINST MALARIAL MOSQUITO. Mfrs. Rec. 87 (8): 81–83, illus. Feb. 19, 1925. 297.8 M31

Quoted *in* Lit. Digest 85 (1): 29, illus. Apr. 4, 1925. Libr. Cong.

An account of experiments in the control of mosquitoes and the cotton boll weevil with calcium arsenate by the U. S. Bureau of Entomology at the Mound and Tallulah (La.) laboratories.

VIRIDENKO, P. A. (105)
GLAVNEĬSHIE ÉTAPY RAZVITIÎA DELA ZASHCHITY RASTENIĬ NA SEVERNOM KAVKAZE [THE MAIN STAGES IN THE DEVELOPMENT OF PLANT PROTECTION IN THE NORTHERN CAUCASUS]. Sev. Kavkazsk. Kraev. Zemel. Upravlenie. Kraev. Sta., Zashch. ot Vred. Ser. A. No. 8, 16 pp. Rostov-na-Donu, 1925. [In Russian.] 423.92 Se8P

Suggests the use of the airplane and cites its advantages for locust control in inaccessible reed beds. The method will require entirely new apparatus and new types of insecticides.

UVAROV, B. P. (106)
BOR'BA S VREDITELÎAMI KHLOPCHATNIKA PRI POMOSHCHI AÉROPLANOV [CONTROL OF COTTON PESTS BY AIRPLANE]. Khlopkov. Delo 4 (1/2): 67–72. January/February 1925. [In Russian.] Libr. Cong.

Gives detailed account of dusting experiments by U. S. Bureau of Entomology at Tallulah, La. (1922), and of practical work in Georgia in cooperation with the Huff Daland Company. The U. S. S. R. will apply the airplane method against cotton pests (*Heliothis armigera*, *Laphygma exigua*, etc.) in Turkestan and Transcaucasia. Since tests in South Africa indicate that dusting can also be used against locusts, the U. S. S. R. will study details of technique and organization and adopt this method.

WIEDEMAN. (107)
VORDRINGEN DER FICHTENBLATTWESPE IN NORDSACHSEN. Kranke Pflanze 2 (9/10): 198–199. September/October 1925. 464.8 K86

Measures hitherto used to control *Pristiphora abietina* in North Saxony have failed, but it is hoped that airplane dusting will prove successful.

WOLFF, M. (108)
MIT DEM FLUGZEUG GEGEN WALDVERWUSTUNG. Kranke Pflanze 2 (9/10): 199–202. September/October 1925. 464.8 K86

Discusses problems incident to airplane control of *Panolis flammea* and other forest insects in Germany. Calcium arsenate and various other insecticides are used.

——— (109)
EIN NACHWORT ZUR SCHÄDLINGSBEKÄMPFUNG MIT FLUGZEUG UND ARSEN IM JAHRE 1925. Deut. Forstwirt 7 (93): 871. Aug. 26, 1925. Duke Univ. Libr.

Pest control with airplanes and arsenic in 1925.

——— and KRAUSSE, A. (110)
DIE EINFÜHRUNG DER ARSENVERSTÄUBUNG VOM FLUGZEUG AUS IN DIE PRAXIS DER FORSTSCHÄDLINGSBEKÄMPFUNG. Anz. f. Schädlingsk. 1 (9): 99–100. Sept. 15, 1925. 421 An9

Account of introduction into German forest practice of airplane dusting with arsenicals. Cites several examples, with particular reference to work described by Krieg (item 89). A note by K. Escherich, pp. 100–101, gives additional data.

——— and KRAUSSE, A. (111)
DIE FLUGZEUG IM DIENSTE DER FORSTWIRTSCHAFT. FLUGZEUG UND FORSTSCHUTZ. Deut. Forstwirt 7 (91): 833–834. Aug. 19. 1925. Duke Univ. Libr.

See also Deut. Forstwirt Bildbeilage 1 (1): 3. Aug. 19, 1925.

The Merck product Esturmit, which had been successfully used by Dr. Albert Sturm against *Clysia ambiguella*, was tested, together with other arsenicals, for airplane dusting against *Panolis flammea*. The authors advise that no preparation be used which has a concentration below that of the Gutler-Scharfe product. This contains 37 to 40 percent arsenic acid, with a content of less than 75 percent soluble arsenic acid. It is possible that the German pines could stand a higher percentage of water-soluble arsenic without burning. Calcium arsenate should be used in preference to lead arsenate as it is less expensive and not so dangerous to man or animals. It was difficult to find pilots with sufficient experience to fly safely at the low altitudes required for efficient dusting.

——— and KRAUSSE, A. (112)
DIE VORGESCHICHTE DES ARSENFLUGZEUGKAMPFES GEGEN FORSTSCHÄDLINGE. Forstarchiv 1 (2): 36–40, illus. Aug. 1, 1925. 99.8 F7723

Early history of airplane control of forest pests with arsenicals.

1926

ANONYMOUS. (113)
AIRPLANE DUSTING EXPERIMENTS. Aviation 20 (21): 798. May 24, 1926. Libr. Cong.

Describes the work of the U. S. Department of Agriculture with paris green against mosquitoes.

——— (114)
AIRPLANE USED TO FIGHT FOREST INSECTS. Amer. Forests and Forest Life 32 (393): 564. September 1926. 99.8 F762

Refers to dusting against the hemlock spanworm [*Lambdina fiscellaria*] at Peninsula State Park, Wis., in July 1926. Includes a statement by C. L. Harrington, Superintendent of Forests and Parks.

——— (115)
DUSTING THE GYPSY MOTH BY AIRPLANE. Aviation 21 (17): 715. Oct. 25, 1926. Libr. Cong.

Comments on work of the U. S. Bureau of Entomology, Division of Gypsy Moth Investigations. The plane used—a 4-passenger Standard, Curtiss C6, 160 h. p. engine—was furnished by the Curtiss Flying Service, Inc. About 25 acres were covered with lead arsenate, dosages varying from 30 to 40 lb. per acre, in 15 hr. actual flying time. The results were excellent.

——— (116)
FIGHTING INSECT PESTS WITH THE AEROPLANE. Discovery [London] 7 (77): 172–174, illus. May 1926. Libr. Cong.

Account of early work, advantages of the method, and uses to which planes may be put.

——— (117)
THE MAN-MADE BIRD CATCHES THE WORM. AIRPLANES THAT BLOW OUT DUST AT THE RATE OF AN ACRE A MINUTE. Rural New-Yorker 85 (4909): 1037–1038. July 24, 1926. 6 R88

Control of the boll weevil by airplane dusting has saved the cotton crop in the South.

——— (118)
USES OF AIRCRAFT IN AGRICULTURE, FORESTRY, ETC. Aircraft Year Book 1926, pp. 71–77, illus. 333.8 Ai72

BARBEY, A. (119)
L'AVIATION PROTECTRICE DES FORÊTS. Illustration 84 (4372): 689–[691], illus. Dec. 18, 1926. Libr. Cong.

English translation *in* Indian Forester 53 (10): 587–591. October 1927. 99.8 In2

Refers to pine moth (*Panolis flammea*) control in the Hagenau Forest by airplane application of calcium arsenate. A 280-h.-p. biplane, carrying a load of 550 lb., flew at 15 to 50 ft. above the crowns of the trees and formed a dust cloud from 50 to 70 ft. in width. Caterpillars fell to the ground on the 4th or 5th day. A 48-hour rain marred the experiment. The cost is figured at 350 francs per ha.

BLYTHE, R. R. (120)
COTTON DUSTING BY AIRPLANE. Com. and Finance 15 (2): 133–134, illus. Jan. 13, 1926. 286.8 C737

DANCKWORTT, P. W., and PFAU, E. (121)
MASSENVERGIFTUNGEN VON TIEREN DURCH ARSENBESTÄUBUNG VOM FLUGZEUG. Ztschr. f. Angew. Chem. 39 (48): 1486–1487. Dec. 2, 1926. 384 Z33

The authors, who worked daily with cases of animal poisoning, cannot concur in the opinion of Dr. Wolff that airplane dusting mixtures are not toxic to man and animals. They discuss the control of *Tortrix viridana* with calcium arsenate in oak forests of Haste, Germany. After this dusting many forest animals were found dead, and there was great mortality among bees in adjacent hives. Although arsenical dusting was not proved to be the sole cause of death, preventive measures are strongly advised.

DEUTSCHER AERO LLOYD A. G. (122)
FORSTSCHÄDLINGSBEKÄMPFUNG DURCH FLUGZEUGE. Bad. Bl. f. Angew. Ent. 2 (2): 101–105. October 1926. 421 B14

Refers to the airplane dusting experiments carried out at Biesenthal for the control of forest insects. The airplane used was supplied by Deutscher Aero Lloyd.

EIDMANN, H. (123)
DIE FLUGZEUGBEKÄMPFUNG DES KIEFERNSPANNERS IN BAYERN. Anz. f. Schädlingsk. 2 (5): 53–56. May 15, 1926. 421 An9

Reviews work against *Bupalus piniarius* in Bayern forests.

ESCHERICH, K. (124)
DIE "FLUGZEUGBEKÄMPFUNG" DES KIEFERNSPANNERS IM BAYRISCHEN FORSTAMT ENSDORF. Forstwiss. Centbl. 70 (3): 73–94, illus. Feb. 1, 1926. 99.8 F775

Describes dusting of pine forests with a proprietary mixture containing 12 percent of arsenic pentoxide against *Bupalus piniarius* in the Bayern Forestry Division, Ensdorf. The allowance of 550 lb. to 13½ acres proved insufficient for trees over 15 ft. in height. The type of plane used was the Junkers Limousine F. 13. Only about 810 acres were treated in 6 weeks because, on account of unfavorable weather, flights could be made on but 19 out of 44 days, with an average of 4 per day. Improvements are needed in both the insecticide and the dust distributor.

——— (125)
FORSTENTOMOLOGISCHE GRUNDLAGEN DER FLUGZEUGBEKÄMPFUNG. Deut. Forstwirt 8 (10): 97–98. Jan. 20, 1926. Duke Univ. Libr.

If airplanes are to be used economically for applying insecticides against forest pests, research will be necessary to determine the minimum dose for each species to be controlled.

*FRANZ. (126)
NONNENBEKÄMPFUNG DURCH BESTÄUBUNG VOM FLUGZEUGE AUS. Prussia. Min. f. Landw. Domänen u. Forsten. Forstl. Flugbl. 15, 5 pp. Neudamm, J. Neumann, 1926.

An account of a successful experiment in arsenical dusting by airplane against *Lymantria monacha.*—Abstract *in* Rev. Appl. Ent., A 15: 468. 1927.

GASOW, H. (127)
FORSTENTOMOLOGISCHE UNTERSUCHUNGEN. Biol. Reichsant. f. Land- u. Forstw. Arb. 5 (1): [75]–98. September 1926. 410.9 G31

Pt. II. Versuche über die Wirksamkeit staubförmiger chemikalien gegen die Raupe des Kiefernspanners (*Bupalus piniarius*), pp. 78–96. Describes tests to determine suitable dusts for use in airplane and ground dusting. Sodium fluoride, sodium fluosilicate, barium fluoride, and certain proprietary arsenicals were found effective if applied not later than the end of August.

References.

GEINITZ, B. (128)
FLUGZEUGSCHÄDLINGSBEKÄMPFUNG UND IMKEREI. Bad. Bl. f. Angew. Ent. 2 (2): 107–109. October 1926. 421 B14

Describes the losses experienced by German beekeepers as a result of the applications of insecticides from airplanes.

——— (129)
ZUR GESCHICHTE DER SCHÄDLINGSBEKÄMPFUNG VOM FLUGZEUG AUS. Bad. Bl. f. Angew. Ent. 2 (2): 105–107. October 1926. 421 B14

Development of insect control by means of airplanes in America and Germany.

GRANOVSKY, A. A. (130)
THE CONTROL OF GRASSHOPPERS BY AIRPLANE DUSTING. Jour. Econ. Ent. 19 (5): 791–795. October 1926. 421 J822

A review of Russian experiments on the control of *Locusta migratoria* and *Calliptamus italicus.*

HILGENDORFF, G., and BORCHERT, A. (131)
UEBER DIE EMPFINDLICHKEIT DER BIENEN GEGEN ARSENSTÄUBEMITTEL. Deut. Pflanzenschutzdienst Nachrichtenbl. 6 (5): 37–38. May 1926. 464.9 N11

Investigation of airplane dusting of forests in Germany with arsenicals by the Imperial Biological Institute (Biologische Reichsanstalt für Land- und Forstwirtschaft) proved conclusively that serious losses among bees result.

HINDS, W. E. (132)
AIRPLANE DUSTING OF COTTON FOR BOLL WEEVIL CONTROL. (Abstract) Jour. Econ. Ent. 19 (4): 607. August 1926. 421 J822

An organized commercial dusting service was first available to Louisiana planters in 1925. The planes at a speed of 100 miles per hr. dusted an acre in less than 2 sec. One plane can protect 5,000 acres of cotton during a season.

——— (133)
PROGRESS IN COTTON BOLL WEEVIL CONTROL. Jour. Econ. Ent. 19 (1): 112–120, illus. February 1926. 421 J822

The development of airplane dusting is discussed on pp. 116–119.

——— and SPENCER, H. (134)
DEPARTMENT OF ENTOMOLOGY. La. Agr. Expt. Sta. Rpt. 1926: 92–104. Baton Rouge. 100 L93

Report on cooperative work with Huff Daland Dusters, Inc., and A. Wilbert Sons & Co. on airplane dusting of *Diatraea saccharalis* with sodium fluosilicate. Under the most favorable conditions a coverage of 25 acres in less than 2 min. was obtained. Leaf burning due to the poison was less than damage done by larvae. Dusted areas contained about one-half as many borers as undusted areas. A single application, properly applied when infestation justifies, will result in reduction of subsequent infestation and material saving in crop. Exceptionally clean seed cane was also noted. (Pp. 97–100.)

IMMS, A. D. (135)
THE USE OF THE AEROPLANE FOR APPLYING INSECTICIDES. Gt. Brit. Min. Agr. Jour. 33 (3): 205–210, illus. June 1926. 10 G79J

Reprinted without plates *in* Trop. Agr. [Trinidad] 3 (11): 225–227. November 1926. 26 T754

Describes experiments in the United States in which two different models of planes were used and states advantages of dusting from the air. Notes that a large amount of poison adhered to plants over a wide path. Also describes use of planes in Germany in forest insect control, and work in 1924 in Russian Turkestan against locusts.

IVANOV, P. [D.] (136)
AGIT-SAMOLET I BOR'BA S VREDITELÎAMI [A PLANE TO STIMULATE THE INTEREST OF THE PEASANTS AND PEST CONTROL]. Samolet 4 (1): 19. January 1926. [In Russian.] Libr. Cong.

Discusses the advantages of constructing a plane for pest control which may be easily converted for other uses in the village—a plane to arouse the interest of the peasants in aviation.

JARDINE, J. T. (137)
APPLICATION OF DUST INSECTICIDES BY MEANS OF THE AIRPLANE. Oreg. Agr. Expt. Sta. Bien. Rpt. 1924/26: 106–107. Corvallis, 1926. 100 Or3

Dusting alfalfa for control of alfalfa weevil (*Hypera postica*).

KING, W. V., and BRADLEY, G. H. (138)
AIRPLANE DUSTING IN THE CONTROL OF MALARIA MOSQUITOES. U. S. Dept. Agr. Dept. Cir. 367, 15 pp., illus. Washington, D. C., 1926. 1 Ag84D

Paris green diluted with tripoli earth was used over the breeding grounds of *Anopheles* mosquitoes in the swamps near Mound, La. Tests were made of the drift of the dust over open ground and over trees, lakes, and swamps. Open pans containing a counted number of larvae were distributed over the lake and the results estimated by an examination of these pans. In the most successful experiments the mortality was 92 and 100 percent respectively. Authors conclude that ½ lb. of paris green per acre is sufficient over rice fields and open parts of lakes but must be increased over areas protected by vegetation.

——— and BRADLEY, G. H. (139)
AIRPLANE DUSTING IN THE CONTROL OF MALARIA MOSQUITOES. Jour. Trop. Med. and Hyg. [London] 29 (18): 311–313, illus. Sept. 1, 1926. 448.8 J827

KOROTKIKH, G. I. (140)
BOR'BA S VREDITELÎAMI LESNOGO I SEL'SKOGO KHOZÎAÏSTVA [PEST CONTROL IN FORESTRY AND IN AGRICULTURE]. Samolet 4 (4): 35. April 1926. [In Russian.] Libr. Cong.

Reports requests for airplane dusting received by the agricultural section of the Aviakhim from various regions of the Soviet Union and the plans of Aviakhim in conjunction with Narkomzem to meet the requests.

——— (141)
OPYTY PRIMENENIÎA SAMOLETOV V BOR'BE S VREDITELÎAMI SEL'SKOGO KHOZÎAÏSTVA [EXPERIMENTS IN THE USE OF AIRPLANES FOR THE CONTROL OF AGRICULTURAL PESTS]. Zashch. Rast. ot Vred. 2 (7): 435–454, illus. April 1925, published 1926. [In Russian.] 421 D36

Detailed account of the preliminary work on the general technique of airplane dusting which led to its practical use. Includes descriptions of structure and handling of planes, types of hoppers, and effects of wind and altitude on dust distribution.

KRIEG, H. (142)
DIE BEKÄMPFUNG DES EICHENWICKLERS IN DEN OBERFÖRSTEREIEN BISCHOFSWALD ÜND HASTE. Forstarchiv 2 (18): [273]–276, illus. Sept. 15, 1926. 99.8 F7723

Silesia, a calcium arsenate preparation, was dusted over about 375 ha. in experiments to control *Tortrix viridana* in the forestry districts of Bischofswald and Haste. The experiments showed that properly timed applications under reasonably favorable weather conditions would prevent serious defoliation. Bees and livestock should be moved to another location.

——— (143)
DIE BEKÄMPFUNG FORSTLICHER SCHÄDLINGE VOM FLUGZEUG. Naturhist. Ver. der Preuss. Rheinlande Verhandl. (1925) 82: 40–50, illus. 1926. 509 B64

Detailed descriptions are given of the operations in the Government forests of Sorau, Luebben, and Regenthin for the control of insect pests by means of airplanes discharging calcium arsenate and dicalcium arsenate. *See also* item 89.

References, p. 50.

——— (144)
BEKÄMPFUNG FRESSENDER FORSTSCHÄDLINGE VOM FLUGZEUG. Deut. Gesell. f. Angew. Ent. Verhandl. (1925) 5: 25–27. 1926. 420 D48V

Airplane control of forest insects.

LOUNSBURY, C. P. (145)
CONTINUOUS WAR AGAINST THE INSECTS. Farming in So. Africa 1 (9): 334–338, illus. December 1926. 24 So842

Report of the Chief, Division of Entomology, Department of Agriculture, Union of South Africa, 1925/26.

Reports (p. 335) experiments with airplane dusting against the eucalyptus snout beetle, *Gonipterus scutellatus*, on plantations near Johannesburg. The Air Service of the Defense Department applied the dust, using a modified De Haviland 9 military plane. Both larvae and adults were readily poisoned by the arsenate of lime; but, because there were insufficient calm dry periods, it was concluded that airplane dusting with equipment available would not be commercially feasible.

MCCOWN, M. (146)
AIRPLANE DUSTING OF FRUITS. Amer. Fruit Grower Mag. 46 (2): 18, illus. February 1926. 80 G85

On July 31, 1925, a demonstration of airplane dusting was made at Mitchell, Ind., by the Morse Agricultural Air Service of New York. This is believed to be the first use of this method over an apple orchard. The equipment is described. The dust particles acquire a static electrical charge.

*Mokrzecki, Z. (147)
PRÓBY TEPIENIA SZKODNIKÓW LEŚNYCH ZAPOMOCA GAZÓW I PROSZKÓW TRUJACYCH [DUSTING BY AIRPLANE AND FUMIGATION OF THE STANDS IN THE FOREST DISTRICT OF POMMERN INFESTED BY THE NUN MOTH]. Las Polski 6? (1): 24–31. 1926. [In Polish. German summary.]

Also issued as a 12 page reprint, Warsaw, 1926.

German summary appears also *in* Anz. f. Schädlingsk. 2 (7): 90. July 15, 1926. 421 An9

During successful dusting experiments against *Lymantria monacha* it was discovered that the crowns of the trees had a negative charge of electricity, and that if the calcium arsenate was given a positive charge, it would adhere well to the needles.—Abstract *in* Rev. Appl. Ent. A 14: 197. 1926.

——— (148)
WALKA ZE SZKODNIKAMI ZAPOMOCĄ SAMOLOTÓW ORAZ ŚWIEC GAZOWYCH [THE CONTROL OF PESTS WITH THE AID OF AIRPLANES AND FUMIGATING CANDLES]. Polski Pismo Ent. 4 (4): 253–256, illus. 1926. [In Polish. German summary, p. 256.] 421 P76

Calcium arsenate against the nun moth, *Lymantria monacha*.

Morrill, A. W. (149)
AIRPLANE DUSTING FOR THE CONTROL OF VEGETABLE PESTS ON THE MEXICAN WEST COAST. Jour. Econ. Ent. 19 (5): 695–699. October 1926. 421 J822

Applications of insecticides and fungicides were made to approximately 7,500 acres of tomatoes and 500 acres of peas. A single Huff-Daland plane with two pilots and a mechanic, with the occasional assistance of a laborer or two, was capable of doing the work that would require from 1,500 to 2,000 men using ground machinery. Calcium arsenate was used against *Heliothis armigera* and *Keiferia glochinella* on tomatoes. The most important experimental work was done in the use of calcium cyanide against flea hoppers (*Halticus citri*). Finer dusts and dust mixtures were ineffective owing to rapid release of gas and short duration of fumes. Flake forms gave practically 100 percent kill at 40 to 60 lb. per acre in calm air, from a height of 25 ft., 2 or 3 times as high as for calcium arsenate. Granular form may, however, prove preferable to use.

——— (150)
FIGHTING PESTS WITH AIRPLANES. Calif. Cult. 67 (3): 53, 71, illus. July 17, 1926. 6 C12

Reviews previous American work in airplane dusting and discusses successful applications of insecticidal and fungicidal dusts over large areas of tomatoes and peas on the west coast of Mexico and in the Imperial Valley. Best results were obtained against tomato fruitworms when the planes flew 8 to 10 ft. above the tops of the plants, depositing calcium arsenate in a strip about 150 ft. wide. Two applications would hold infestation down to 10 percent.

Morse, A. L. (151)
AIRPLANE DUSTING. Ind. Hort. Soc. Trans. (1925) 65: 34. 1926. 81 In2

Address given at a demonstration by the Morse Agricultural Service in dusting an apple orchard. Cites advantages of the method, including avoidance of transmitting spores or insect pests by laborers walking through the infested area.

Morse, S. F. (152)
AIRSHIPS FOR MOSQUITO CONTROL. N. J. Mosquito Extermin. Assoc. Proc. (1926) 13: 80–82. 420 N46

Discussion, pp. 82–83.

Records work done by Dr. W. V. King at Mound, La.; describes type of distributor required; and discusses possibilities for airplane control of *Anopheles* in New Jersey.

Morstatt, H. (153)
ARSEN UND FLUGZEUG BEI DER BEKÄMPFUNG DES BAUMWOLLKAPSELKÄFERS. Anz. f. Schädlingsk. 2 (3): 34–35. Mar. 15, 1926. 421 An9

Deals with the experiments at the Delta Laboratory, Tallulah, La., on the application of arsenic by airplane for the control of *Anthonomus grandis*.

NELSON, E. (154)
AIRCRAFT MAKES WAR ON BOLL WEEVIL. Banker-Farmer 13 (5): 4–5, 14, illus. April 1926. 284.28 B22

Describes work of B. R. Coad and the development of Huff Daland Dusters, Inc. Outlines advantages of applying calcium arsenate by plane and points out how nature of terrain can limit its use.

PARFENT'EV, I. A. (155)
BEKÄMPFUNG DER WANDERHEUSCHRECKEN IN IHREN BRUTPLÄTZEN. Anz. f. Schädlingsk. 2 (9): 127–131, illus. Sept. 15, 1926. 421 An9

Discusses breeding places of *Locusta migratoria* in southern U. S. S. R. Reviews control measures, including airplane dusting.

PRELL, H. (156)
DIE CHEMISCHE BEKÄMPFUNG DER FORSTSCHÄDLINGE VOM FLUGZEUG AUS. Deut. Forstwirt 8 (14): 136. Jan. 27, 1926; (66): 658–659. May 29 1926. Duke Univ. Libr.

Contents: [1.] Ein geschichtlicher Beitrag. 2. Ein biologischer Beitrag. Historical account and discussion of effect on bees of chemical control of forest pests from airplanes. States that the operations in the Sorau Forest district seriously damaged or destroyed about 150 colonies. Author has no objection to the method, but questions suitability of calcium arsenate as a material.

PUSTET, and SELL. (157)
VERSPRICHT DIE BEKÄMPFUNG DER MAIKÄFER MIT GIFTHALTIGEN VERSTÄUBUNGSMITTELN VOM FLUGZEUG AUS ERFLOG? Prakt. Bl. f. Pflanzenbau u. Pflanzenschutz 4 (2): 25–30. May 1926. 464.8 P88

Airplane dusting of forests for control of cockchafers (*Melolontha* spp.) is unsatisfactory because the insects emerge over a period of from 4 to 6 weeks and at a time when rain is frequent and new leaves are continually forming. These conditions would call for repeated applications.

S————————Y. (158)
WIE DEUTSCHLAND DIE NONNE [LYMANTRIA MONACHA] VOM FLUGZEUG AUS BEKAMPFT. Wien. Allg. Forst- u. Jagd-Ztg. 44 (10): 61. Mar. 5, 1926. 99.8 Oe82

Discusses use of calcium arsenate and nicotine preparations, and refers to work of Wolff, Escherich, and Ebert.

SNAPP, O. I. (159)
AIRPLANE DUSTING OF PEACH ORCHARDS. Jour. Econ. Ent. 19 (3): 450–459. June 1926. 421 J822

When the agitation in the hopper was doubled and the rate of discharge of dust reduced one-half, planes equipped for dusting cotton with calcium arsenate proved satisfactory for the heavier sulfur-lead arsenate-lime mixture. One thousand acres of Georgia orchards were dusted by planes, which flew 10 to 20 ft. above the ground at about 85 miles per hr., and dusted about 5,000 trees per hour. Airplane dusting proved to be as effective against *Conotrachelus nenuphar* as ground-machine dusting, and the lead arsenate was better distributed over the foilage. Further experiments are needed under varying conditions of weather and infestation.

——— (160)
PEACH PEST INVESTIGATIONS DURING THE YEAR. Ga. State Hort. Soc. Proc. (1926) 50: 52–56. 81 G29

Four peach orchards were selected for experimental dusting (two by ground machine, two by airplane). The plane used was a commercial duster which flew at a speed of approximately 85 miles per hr., laying a swath of about 40 ft. in width for 0–5–95 dust and of 60 ft. for 80–5–15 dust. About 5,000 trees were treated per hr. Results from the two types of machines were obtained from "drops" and from harvested fruit. Under the conditions existing in middle Georgia, airplane dusting was found as effective against curculios as ground work, but further experiments were needed to fully establish their relative merits. A better distribution of lead arsenate was noted in airplane-treated orchards.

SOUTH AFRICA. DEPARTMENT OF AGRICULTURE. (161)
DEPARTMENTAL ACTIVITIES. ENTOMOLOGY. So. Africa Dept. Agr. Jour. 12 (3): 195–201. March 1926. 24 Un3

Includes report on experiments made in airplane dusting with calcium arsenate against the eucalyptus-snout beetle, *Gonipterus scutellatus*. Although successful, the method was not thought practical.

SVIRIDENKO, P. A. (162)
O RABOTAKH SEVERO-KAVKAZSKOĬ AVIATSIONNOĬ ÉKSPEDITSII PO BOR'BE S SARANCHEĬ [THE WORK OF THE NORTH CAUCASIAN AVIATION EXPEDITION FOR THE CONTROL OF LOCUSTS]. Sev. Kavkaz. Kraev. Sta. Zashch. Rast. Izv. 1, pp. 81–99. 1926. [In Russian.] 423.92 Se8

A preliminary account of the first dusting campaign in which locusts were successfully destroyed in the reed beds of the North Caucasus. The best results were obtained with paris green and sodium arsenite when applied at the rate of 10 to 12 lb. to 3 acres if broadcast, or 4 to 5 lb. if applied in strips. The dust penetrated dense reeds up to 16 ft. high and adhered well to leaves and even the stems.

WALTER, G. (163)
DIE REKÄMPFUNG DER FORLEULE UND DER NONNE IN DEN OBERFÖRSTEREIEN BIESENTHAL UND SORAU IM JAHRE 1925. 86 pp., illus. Neudamm, J. Neumann, 1926. 430 W172

Detailed account of work against *Lymantria monacha* and *Panolis flammea*, including airplane dusting with calcium arsenate. Dusts must contain at least 20 percent pure arsenic, and at least 4½ to 5 lb. per acre must be used. Best results are obtained in the evening and in still air. This method was more effective than fumigation with clouds of nicotine smoke. A supplement gives tables showing the effect of calcium arsenate on the larvae.

WILSON, G. F. (164)
SPRAYING CROPS FROM AEROPLANES. Nature [London] 118 (2968): 412. Sept. 18, 1926. 472 N21

Corrects statement made in an unsigned article *in* Nature [London] 118 (2963): 239. Aug. 14, 1926.

Airplane dusting was first tried in Great Britain in 1922 on the farm of Major Bartlett and not in 1926 by W. J. Craven & Co.

WILSON, R. J. (165)
[BOLL WEEVIL CONTROL BY AIRPLANE.] Cong. Rec. 67 (3): 3062–3063. Jan. 30, 1926. 148.2 R24

Reprinted with above title *in* Agr. Insecticide and Fungicide Assoc. Bul. 4, pp. 9–11. March 1926. 423 Ag8

Reviews history and development of airplane dusting in the United States. Remarks made before the Committee of the Whole House on Agricultural Appropriation Bill H. R. 8264.

WISCONSIN. AGRICULTURAL EXPERIMENT STATION. (166)
AIRPLANE DUSTING OF HEMLOCKS TO CONTROL SPANWORMS [LAMBDINA FISCELLARIA]. Wis. Agr. Expt. Sta. Bul. 388 (Ann. Rpt. 1924/26), pp. 65–67, illus. Madison, 1926. 100 W75

A light Curtiss plane was used to distribute about 15,000 lb. of calcium arsenate dust over 1,000 acres of forest in the Peninsula State Park, Door County, Wis. A count of larvae on cheesecloth squares placed on the ground showed a mortality of 98 dead specimens per sq. yd. In the hemlock forest the mortality was 90 percent and in mixed forest areas more than 80 percent.

WITHYCOMBE, C. L. (167)
FROGHOPPER BLIGHT. Trop. Agr. [Trinidad] 3 (5): 96–97. May 1926; 3 (6): 120–121. June 1926. 26 T754

Airplane distribution of a contact dust only control method likely to be effective or economical against *Tomaspis saccharina*.

——— (168)
THE SUGAR CANE FROGHOPPER [TOMASPIS SACCHARINA]. Trinidad and Tobago Agr. Soc. Proc. 25 (6): 294–301. June 1926. 8 T73

Recommends trial of airplane dusting.

*Wolff, M., and Krausse, A. (169)
FRÜHDIAGNOSE UND KONTROLLE VON FRASSKALAMITÄTEN IM WALDE SOWIE VORSICHTSMASSREGELN BEIM ARSENBEFLUG. Prussia. Min. f. Landw. Domänen u. Forsten. Flugbl. 7, 4 pp., illus. Neudamm, J. Neumann, 1926.

Cites need for early diagnosis and observation of forest insect outbreaks and recommends precautionary measures needed when airplane dusting is employed.—Abstract *in* Allg. Forst- u. Jagd-Ztg. 102: 379. 1926; Rev. Appl. Ent. A 14 (8): 414. 1926.

Zarzar, V. (170)
LETNÎAÎA RABOTA AVIAKHIMA [SUMMER WORK OF THE AVIAKHIM]. Samolet 4 (6): [8]–9. June 1926. [In Russian.] Libr. Cong.

Discusses work and plans of the Aviakhim Society in general, with special reference to the work of the expedition in Dagestan in locust control.

Zriakovskiĭ, V. N. (171)
AZIATSKAÎA SARANCHA V TERSKOM OKRUGE ZA PERIOD 1922–1925 G. [ASIATIC LOCUST IN THE TEREK REGION DURING THE PERIOD 1922–25]. Terek. Okruzhnaîa Sta. Zashch. Rast. Izv. 1 (2): 35–60, maps. April 1926. [In Russian.] 464.9 T27

Discusses the locusts of the region and the various unsuccessful methods of control used against them. Expresses hope for effective control by the aviochemical method.

References. pp. 56–57.

1927

Anonymous. (172)
AN AERIAL ATTACK ON INSECT ARMIES. Illus. Canad. Forest and Outdoors 23 (10): 555, illus. October 1927. 99.8 C16

Short account of the dusting on Cape Breton Island against the spruce budworm (*Archips fumiferana*).

——— (173)
AIRPLANE TO BE USED AGAINST SUGAR CANE INSECTS. Indus. and Engin. Chem. 19 (8): 953. Aug. 1, 1927. 381 J825

The expenditure of $50,000 to conduct large-scale experiments in airplane dusting against the sugarcane moth borer (*Diatraea saccharalis*) has been authorized. Approximately 5,000 acres of sugarcane in Louisiana will be dusted with sodium fluosilicate.

——— (174)
AIRPLANES FOR MOSQUITO CONTROL. PARIS GREEN APPLIED WEEKLY TO SWAMPY AREAS AT THE RATE OF ONE POUND PER ACRE FOUND EFFECTIVE AGAINST ANOPHELES BUT NOT AGAINST OTHER MOSQUITO GENERA. Pub. Works 58 (4): 148–149. April 1927. Pub. Roads Libr.

Reviews work at Quantico, Va.

——— (175)
BOLL WEEVIL CONTROL BY USE OF AIRPLANES. Tex. Agr. Expt. Sta. Ann. Rpt. (1926) 39: 30–31. College Station, 1927. 100 Oh3S

In tests to determine efficiency of method against *Anthonomus grandis*, 11,200 lb. of calcium arsenate were distributed. Although cotton yields were not yet complete, they indicated that the poison effectively reduced weevil damage.

——— (176)
COLLECTING INSECTS BY AIRPLANE. BUREAU OF ENTOMOLOGY DEVELOPS METHOD OF USING AIRPLANES FOR COLLECTING INSECTS AT ALTITUDES. Aviation 22 (22): 1173–1174, illus. May 30, 1927. Libr. Cong.

Illustrations show JN–4 airplane, equipped with trap, and a close-up of the trap.

——— (177)
COMBATING THE WEEVIL BY PLANE. Aviation 22 (14): 678. Apr. 4, 1927. Libr. Cong.

Reviews dusting operations in Utah against the alfalfa weevil (*Hypera postica.*)

——— (178)
DUSTING PLANE DEVELOPMENT IN 1926. Aviation 22 (22): 1174. May 30, 1927. Libr. Cong.

All-metal fuselage has made possible hoppers of larger capacity and has facilitated their installation. Changes mentioned include: funnel placed under fuselage and shape improved; power agitators installed; new type of rotary valve and electrically operated automatic valve developed for large planes.

——— (179)
HUFF DALAND DUSTERS GO TO PERU. Aviation 22 (12): 568, 569, illus. Mar. 21, 1927. Libr. Cong.

Five planes arrive in Peru to dust cotton with calcium arsenate against leaf worm (*Alabama argillacea*), aphids (*Aphis gossypii*), and the boll weevil (*Anthonomus grandis*).

——— (180)
METHODS FOR CONTROLLING INSECT PESTS. Science 66 (1718, sup.): XII. Dec. 2, 1927. 470 Sci2

Refers to an account given by Dr. L. O. Howard of airplane dusting over a forest in Czechoslovakia.

——— (181)
MOSQUITO [ANOPHELES] CONTROL BY AIRPLANE. Water Works 66 (11): 444 November 1927. 292.8 W292

Demonstration by U. S. Public Health Service near Bamberg, S. C.

——— (182)
EIN NEUES FLUGZEUG FÜR DIE FORSTSCHÄDLINGSBEKÄMPFUNG. Deut. Forstwirt 9 (38): 215. Mar. 9, 1927. Duke Univ. Libr.

Quoted under same title *in* Anz. f. Schädlingsk. 3 (5): 58–59. May 15, 1927. 421 An9

Describes new planes especially designed for insecticidal dusting. They take off in limited space, land at low speed, turn readily, have large storage capacity, and are stable.

BARBEY, A. (183)
LA FIDONIE DU PIN [BUPALUS PINIARIUS] À L'AIDE DE L'AVION. Rev. des Eaux et Forêts (sér. 6) 65 (3): [109]–111, illus. March 1927. 99.8 R322

Also issued as a reprint: Paris, 1927, 3 pp.

Reviewed *in* U. S. Forest Serv. Forest Worker 3 (4): 17. July 1927. 1 F76Fw

About 123 acres of forests in Alsace and Lorraine were covered with 1¼ tons of calcium arsenate. The larvae showed signs of paralysis 3 days after the application and died on the 5th day. A heavy rain fell for 48 consecutive hours after the 2d dusting and seriously affected the results of the test. Only about 33 percent of the insects were killed.

BARNES, D. F., and POTTS, S. F. (184)
AIRPLANE DUSTING EXPERIMENT FOR GIPSY MOTH [PORTHETRIA DISPAR] CONTROL. Jour. Econ. Ent. 20 (1): 213–222, illus. February 1927. 421 J822

Forest areas in Massachusetts were dusted with lead arsenate at the rate of 40 lb. per acre over six selected plots of 25 acres each. Dust covered individual trees uniformly. After the second application larval mortality ranged from 85 to 95 percent. Differing heights of trees make flying conditions more difficult over forest areas than over low-growing crops. In order to keep close to tops, a course which produces best results, the pilots must fly at varying altitudes. Difficulty was found in treating hillsides unless wind was toward the slope. Cost for season was from $15.03 to $29.12 per acre.

BLAKE, A. E. (185)
PEST DESTRUCTION BY AEROPLANE. Sci. Prog. 21 (84): 688–691. April 1927. 472 Sci22

A general note citing the dusting of a catalpa grove at Dayton, Ohio, and the experiments in cotton dusting at Tallulah, La. Mentions the electrical

charge in dust sprayed from an airplane and its effect. Refers to forest dusting in Germany and at Haguenau, France. Discusses possible new fields for this type of control.

BRASSLER, K. (186)
AUSBAU DER FLUGZEUGE FÜR DEN DIENST IN DER SCHÄDLINGSBEKÄMPFUNG. Forstarchiv 3 (16): 282–283. Aug. 15, 1927. 99.8 F7723

Successful airplane dusting requires a plane specially equipped for this purpose. Lists the six points outlined by Dr. G. A. Kienitz as desirable and states that the Caspar plane C 32 answers these requirements.

CHAMBERLIN, W. J. (187)
THE ARMY OF SILENT TREE-KILLERS. III. CONTROLLING DESTRUCTIVE FOREST INSECTS. Amer. Forests and Forest Life 33 (400): 219–222, 254, illus. April 1927. 99.8 F762

Airplane dusting discussed on p. 254.

CURTISS-WRIGHT FLYING SERVICE. (188)
CONTROL OF CROP INFESTATION BY AIRPLANE DUSTING. 23 pp., illus. [Houston, 1927?] 423 C942

ESCHERICH, K. (189)
SCHÄDLINGSBEKÄMPFUNG VOM FLUGZEUG AUS. Deut. Landw. Gesell. Mitt. 42 (22): 589–593. May 28, 1927. 18 D48M

Discussed under the same title by Erwin Schimitschek *in* Centbl. f. das Gesam. Forstw. 54 (1): 30–31. 1928. 99.8 C33

Reviews work done in the United States and Germany on pest control from the airplane.

FRACKER, S. B., and GRANOVSKY, A. A. (190)
AIRPLANE DUSTING IN A STATE PARK. Wis. Hort. 17 (9): 138–139, 141, illus. May 1927. 80 W752

Account of work done during July 1927 in Peninsula State Park, Door County, Wis., against *Lambdina fiscellaria.* In most cases mortality varied from 80 to 95 percent. The average total cost was $7.04 per acre.

——— and GRANOVSKY, A. A. (191)
THE CONTROL OF THE HEMLOCK SPANWORM BY AIRPLANE DUSTING. Jour. Econ. Ent. 20 (2): 287–294. April 1927. 421 J822

Describes work over forests in Peninsula State Park, Wis. Calcium arsenate was successfully used against larvae of *Lambdina fiscellaria* at the rate of 20 lb. per acre.

——— and GRANOVSKY, A. A. (192)
SKY DUSTING THE HEMLOCKS. Amer. Forests and Forest Life 33 (406): 587–588, 640, illus. October 1927. 99.8 F762

Account of airplane dusting against *Lambdina fiscellaria* over the Peninsula State Park, Wis. The territory was divided into 12-acre blocks, and one load of 250 lb. of calcium arsenate was used on each. About 14 min. was required for each round trip, including loading, and a total of 63 flights were made.

FRIEDRICI, K. (193)
ARSENMITTEL UND FLUGZEUGBEKÄMPFUNG. ZU DEN AUSFÜHRUNGEN DES HERRN DR. GADEMANN. Ztschr. f. Angew. Chem. 40 (17): 487–488. Apr. 28, 1927. 384 Z33

Erwiderung auf die vorstehenden Ausführungen, by Dr. Gademann, p. 488. Friedrici agrees with Gademann that the ingredients in arsenical compounds should be listed, but does not consider paris green the best chemical. Lead arsenate, sodium arsenate, and calcium arsenate have driven paris green from the market. A reply by Dr. Gademann follows in which he states that he is well acquainted with the advantages and disadvantages of paris green and other arsenicals. He still considers that its color makes paris green the safest to use. Cites criticisms in American and English papers of lead arsenate residues.

GADEMANN. (194)
MASSENVERGIFTUNG VON TIEREN DURCH ARSENBESTÄUBUNG VOM FLUGZEUG. ZU DEN GLEICHLAUTENDEN ARTIKEL VON P. W. DANCKWORTT UND E. PFAU. Ztschr. f. Angew. Chem. 40 (7): 202–203. Feb. 17, 1927. 384 Z33

The use of dust and spray materials in Germany is comparatively recent. Before the war paris green was exported because the Government Board of Health forbade its sale in Germany. Entomologists and other interested organizations succeeded in getting the ban removed. The resultant demand created a boom in arsenicals until the supply exceeded the demand and prices fell. The author agrees to a certain extent with Danckwortt and Pfau. Gives arguments for and against the use of arsenicals. Paris green, because of its color, is less dangerous to use than the others. The important question is whether airplane dusting is the most effective control method. If so, safer materials and technique can be found.

*GUSSONE, H. (195)
VORBEREITUNG UND DURCHFÜHRUNG EINER INSECTENBEKÄMPFUNG DURCH ARSENBESTÄUBUNG. Prussia. Min. f. Landw. Domänen u. Forsten. Forstl. Flugbl. 20, 9 pp. Neudamm, J. Neumann, 1927.

Review of various problems in the planning and execution of arsenical airplane dusting operations.—Abstract *in* Rev. Appl. Ent. A 15: 468. 1927.

HICKEL, R. (196)
L'EMPLOI DES AVIONS POUR LA DESTRUCTION DES INSECTES NUISIBLES. Acad. d'Agr. de France. Compt. Rend. 13 (3): 90–95. Jan. 19, 1927. 14 P215Bc

Account of the first use of airplane dusting in France, over pines infested with *Bupalus piniarius* in the Forest of Haguenau. Work was unfortunately delayed until end of October. A modified biplane, Salmson 2 A2 1918 model, was used to distribute calcium arsenate over about 130 acres, 22 lb. to the acre. Plane flew 32 to 48 ft. above tops of trees. Larval kill was 35 percent. It was concluded that if airplane were used at the beginning of an outbreak, in conjunction with feeding of pigs in the forest and removal of litter, the moth could be effectively controlled.

HINDS, W. E., and SPENCER, H. (197)
AIRPLANE DUSTING FOR SUGAR-CANE BORER CONTROL IN LOUISIANA. Jour. Econ. Ent. 20 (2): 352–358. April 1927. 421 J822

Reprinted *in* Planter and Sugar Mfr. 78 (20): [381]–382. May 14, 1927. 65.8 L93

Diatraea saccharalis destroys 20 percent of Louisiana sugarcane crop annually. Ground machinery cannot penetrate the cane fields. Experimental dusting with airplanes, a cooperative project between the Louisiana Agricultural Experiment Station and Huff Daland Dusters, Inc., reduced the infestation about 60 percent. Sodium fluosilicate was used, and 15 to 20 lb. per acre were required. A higher degree of control may be expected with improved methods and materials.

——— and SPENCER, H. (198)
INSECTICIDAL CONTROL FOR SUGAR CANE BORER [DIATRAEA SACCHARALIS]. La. Planter & Sugar Mfr. Co., Inc. Ref. Bk. of Sugar Indus. of World 5 (5): 42–43, illus. July 1927. 65.8 L932

Favorable results in 1925 from preliminary tests with sodium fluosilicate led to more extensive work in 1926. Over 1,300 acres were treated by airplane with a standard dust consisting of a commercial sodium fluosilicate to which was added 10 percent of hydrated lime. Untreated fields showed more than twice the amount of borer damage to joints of cane.

——— and SPENCER, H. (199)
INSECTICIDAL CONTROL OF SUGARCANE BORER [DIATRAEA SACCHARALIS]. A REPORT OF PROGRESS. La. Agr. Expt. Sta. Bul. 201, 56 pp., illus. Baton Rouge, 1927. 100 L93

First airplane dusting work on sugarcane: successful use of sodium fluosilicate, pp. 6–7.

HOOGH, J. DE. (200)
INSECTENBESTRIJDING UIT VLIEGTUIGEN [WORK AGAINST INSECTS FROM AIRPLANES]. Wageningen Plantenziektenkund. Dienst, Verslag. en Meded. 49, 56 pp., illus. Wageningen, H. Veenman & Zonen, 1927. 464.9 W122

Surveys the development of airplane dusting in Europe and America and describes experiments against *Lymantria monacha* in Pommern, June 1927. Concludes that, in case of forest insect outbreaks in Holland, this method could be used by an association of forest owners aided by the Government. It might also be of value in the Dutch colonies. Illustrations show various types of planes used.

References, pp. [54]–56.

HUBAULT, E. (201)
UNE INVASION DE FIDONIE [BUPALUS PINIARIUS] DANS LES PINERAIES DE HAGUENAU. ÉPANDAGE D'INSECTICIDES AU MOYEN D'UN AVION. Nature [Paris] 55 (2753): 77–80, illus. Jan. 15, 1927. Bur. Standards Libr.

This experiment has been reported under R. Hickel, item 196.

JUNKERS FLUGZEUGWERK A.-G., DESSAU. (202)
BESCHREIBUNG DER WICHTIGSTEN SCHAEDLINGSBEKAEMPFUNGS-GERAETE DER FIRMA: JUNKERS FLUGZEUGWERK A.-G. 5 pp. [1927. Typewritten.] Natl. Advisory Com. for Aeronaut. Libr.

Describes a dusting device, a device for spraying liquids from an airplane, a method of dropping liquid bombs, and a suspension device, made by the Junkers Airplane Co.

KIENITZ, G. A. (203)
DAS FLUGZEUG IM DIENST DER FORSTWIRTSCHAFT (ENTWICKLUNG, GEGENWÄRTIGER STAND UND ZUKUNFTS AUSSICHTEN). Luftmacht, No. 3, pp. 139–144. March 1927; No. 4, pp. 201–207. April 1927. Natl. Advisory Com. for Aeronaut. Libr.

Gives historical review of airplane dusting in the United States and Germany and reports specific cases of insect-control work in various German localities in 1925. Discusses the advantages of the new method, the insecticides used, and the improvements in technique. Refers to forestry particularly.

KOLSTER. (204)
BEKÄMPFUNG DES KIEFERNSPANNERS IN DER OBERFÖRSTEREI HERSFELD-OST VOM FLUGZEUG AUS. Ztschr. f. Forst. u. Jagdw. 59 (4): 237–251. April 1927. 99.8 Z3

In the experiments described, calcium arsenate, Silesia, was used against *Bupalus piniarius*. The cost was about $5.00 per acre, and the results were satisfactory; but this material is not recommended, as it proved highly toxic to mammals, birds, and bees.

KOROTKIKH, G. I. (205)
PERVAĬA AVIATSIONNAĬA ĖKSPEDITSIIA PO BOR'BE S SARANCHEĬ [THE FIRST EXPEDITION FOR THE CONTROL OF LOCUSTS BY AIRPLANES]. R. S. F. S. R. Otd. Zashch. Rast. ot Vred. Nauch.-Issled. Lab. Otravl. Veshch. Trudy, pt. I, pp. 33–72, illus. Leningrad, 1927. [In Russian. English summary, p. 72.] 391.9 R92

Also *in* Défense des Plantes 3 (6): 479–518, illus. December 1926, published 1927. 421 D36

Detailed account of the work and organization of expedition in North Caucasus. In experiments with the Asiatic locust, *Locusta migratoria*, on river islands a load of 270 lb. was sufficient to cover 500 acres when using either paris green or sodium arsenite. Illustrations show types of planes employed, details of hopper construction, and views of the airplanes in actual operation.

KRIEG, H. (206)
MASSENVERGIFTUNG VON TIEREN DURCH ARSENBESTÄUBUNG VOM FLUGZEUG. ENTGEGNUNG AUF DEN GLEICHLAUTENDEN ARTIKEL VON P. W. DANCKWORTT UND E. PFAU. Ztschr. f. Angew. Chem. 40 (7): 201–202. Feb. 17, 1927. 384 Z33

Reply to an article by P. W. Danckwortt and E. Pfau on mass poisoning of animals by airplane dusting with arsenic.

Dr. Krieg fears that the conclusions of Danckwortt and Pfau will arouse prejudice against the use of arsenicals for plant protection. He cites their use in airplane dusting in other countries, and their role in saving German viticulture. Admits the possibility of arsenical poisoning but points out that safety regulations and precautions can be applied.

——— (207)

ZUR FLUGZEUGBEKÄMPFUNG DES EICHENWICKLERS (TORTRIX VIRIDANA L.) MIT KALZIUMARSENIAT. Anz. f. Schädlingsk. 3 (1): 5–7. Jan. 15, 1927. 421 An9

Experiments with airplanes and calcium arsenate against *T. viridana* over about 4,700 acres of oak forest in Westfalen and adjoining regions. Calcium arsenate (24 percent arsenic) was used at 18 lb. per acre. With low temperatures a mortality of 80 percent was obtained, but later, with higher temperatures, it rose to 100 percent. Dusting is most successful at 59° or over because the larvae are then feeding most actively. *Erannis defoliaria* larvae were also present and proved highly susceptible.

KUNKEL, F. E. (208)

GETTING AFTER THE GYPSY MOTH [PORTHETRIA DISPAR] BY AIRPLANE. Florists' Exch. 64 (2): 110. January 1927. 80 F666

Dusting by the Curtiss Flying Service, Inc., using a standard J–1 plane (Curtiss C–6, 160-hp. motor) equipped with a Morse hopper.

LE PRINCE, J. A., LEGARE, A. E., MCLEAN, N. T., GRIFFITTS, T. H. D., WILLIAMS, L. L., JR., and COOK, S. S. (209)

MOSQUITO CONTROL BY AIRPLANE. MEMORANDUM ON THE DISTRIBUTION OF PARIS GREEN BY AIRPLANE IN THE CONTROL OF ANOPHELES PRODUCTION IN UNCLEARED POND NEAR BAMBERG, S. C., SEPTEMBER 1927. U. S. Pub. Health Serv. Rpts. 42 (38): 2337–2338. Sept. 23, 1927. 151.65 P96

Anopheles quadrimaculatus. Equal parts of paris green and soapstone were used at the rate of 2 lb. per acre. The airplane flew 50 ft. above the tree tops in lines 660 ft. apart, and crossed this area again with lines at right angles to the first trips.

LORGE. (210)

BEKÄMPFUNG DES EICHENWICKLER (TORTRIX VIRIDANA) DURCH BESTAÜBUNG VOM FLUGZEUG AUS IN DER PREUSSISCHEN OBERFÖRSTEREI HASTE. Ztschr. f. Forst– u. Jagdw. 59 (3): 168–178. March 1927. 99.8 Z3

In May 1926 about 1,390 ha. of forest land were dusted with calcium arsenate. The cost was 60 M. per ha., and practically all insects were killed in 4 days. Calm, fair weather is essential. Bees were destroyed in large numbers.

MACANDREWS, A. H. (211)

DUSTING FOR INSECTS BY AEROPLANE. N. Y. State Col. Forestry. Syracuse Univ. News Letter 27 (5): 1–2. October 1927. 99.8 N48

Lists 11 problems to be considered in airplane dusting. Describes plans for dusting against the spruce budworm, *Archips fumiferana*, on Cape Breton and states problems to be faced, as: (1) The wind from the ocean rises at sunrise, and any successful dusting must be done before that time; (2) fogs are frequent in the valleys; (3) it is difficult to time dusting with bud and larval development; (4) conifer leaves do not present broad surfaces for dust to settle on; (5) habits of spruce budworm must be considered. Tests will be made with lead arsenate, John Cowan calcium arsenate, and Doloro calcium arsenate.

MEGALOV, V., and BAZHENOV, G. (212)

MATERIALY K POZNANIIŬ VREDNYKH LESNYKH NASEKOMYKH SARATOVSKOĬ GUB. [CONTRIBUTIONS TO THE KNOWLEDGE OF INJURIOUS FOREST INSECTS OF THE SARATOV PROVINCE]. [Pts. 1–2], 29 pp., illus. Saratov, 1927. [In Russian.] 423 M47

At head of title: Saratovskiĭ gubernskiĭ lesnoĭ otdel.

Lymantria monacha is discussed in pt. 2. Owing to the scattered nature of the infestation, it was not considered advisable to use airplane dusting as a control measure.

MIKHAĬLOV-SENKEVICH, I͡A. M. (213)

O ZNACHENII I VLII͡ANII BOKOVOGO VETRA I RAZNORODNOSTI STROENII͡A INSEKTITSIDOV NA SHIRINU RASPYLA I͡ADA S SAMOLETOV [THE INFLUENCE OF LATERAL WINDS AND THE COMPOSITION OF THE INSECTICIDES ON THE WIDTH OF THE STRIP OF POISON APPLIED FROM AIRPLANES]. Zashch. Rast. 4 (1): 163–166, illus. April 1927. [In Russian.] 421 D36

With a lateral wind the swath is widened. The coarser particles of the dust settle most directly and the finer particles are carried farther by the wind. As these largest and smallest particles have least insecticidal value, the edges of the strips should be made to overlap.

MISSIROLI, A. (214)

LA PREVENZIONE DELLA MALARIA NEL CAMPO PRATICO. I-II. Riv. di Malariol. 6 (3): 501–572, illus. May/June 1927; 7 (4): [413]–455, illus. July/August 1928. 448.8 R523

Includes a brief account of airplane-dusting tests over a large marshy area, using paris green diluted with an equal part of road dust. From a height of 60 to 90 ft. all larvae in a 160-yd.-wide strip can be destroyed. This method is considered of great value in reaching inaccessible places and also where the cost prevents use of other types of treatment.

MORRILL, A. W. (215)

LA DESINFECTIÓN DE LOS CAMPOS DE HORTALIZAS AYUDA DEL AEROPLANO. Hacienda 22 (12): 368–369, illus. December 1927. 6 H11

Refers to experiments on the west coast of Mexico. Deals largely with tomato pests.

——— (216)

PEST CONTROL PROBLEMS ON THE WEST COAST OF MEXICO. Calif. Dept. Agr. Spec. Pub. 73, pp. 70–82. Sacramento, 1927. 2 C121S

Includes discussion of airplane dusting with calcium arsenate against *Heliothis armigera*, and of experimental work with various cyanide dusts against *Halticus citri*.

MORRIS, H. (217)

DUSTING SUGAR CANE FOR BORER [DIATRAEA SACCHARALIS] CONTROL NOT LIKELY TO POISON FORAGE IN ADJACENT FIELDS. Sugar Bul. 5 (24): 3. Sept. 15, 1927. 65.9 Am32

The sodium fluosilicate used is much less toxic to livestock than calcium arsenate and is not apt to drift from the cane fields in injurious quantities. However, livestock should not be pastured on adjacent fields until rains have followed the dusting. Extreme care should be used in handling the poison where mule pastures are used as landing fields.

PARFENT'EV, I. (218)

OTCHET O RABOTAKH V AVIA-KHIMICHESKOĬ ĖKSPEDITSII NARKOMZEMA I SOI͡UZA AVIAKHIM SSSR [REPORT OF THE WORK OF THE AVIOCHEMICAL EXPEDITION OF THE PEOPLE'S COMMISSARIAT OF AGRICULTURE AND THE AVIAKHIM]. R. S. F. S. R. Otd. Zashch. Rast. ot Vred. Nauch.-Issled. Lab. Otravl. Veshch. Trud. 1: 72–86. Leningrad, 1927. [In Russian. English summary, p. 86.] 391.9 R92

Also *in* Défense des Plantes 3 (6): 518–532. December 1926, published 1927. 421 D36

Preliminary tests to determine insecticide most suitable for use against locusts in North Caucasus. Both ground and airplane methods used. Calcium arsenate containing 40 percent arsenic pentoxide did not give satisfactory results. To get a 90 percent kill required the use of paris green or sodium arsenite at the rate of 3 to 4 lb. per acre. Addition of a carrier did not permit decrease in dosage and by increasing bulk made dust less suited for airplane use.

POST, G. B. (219)

DUSTING BY AIRPLANE. Agr. Insecticide and Fungicide Assoc. Bul. 6, pp. 29–32. May 1927. 423 Ag8

Discussion, pp. 32–33.

Refers to work of B. R. Coad of the U. S. Department of Agriculture in Tallulah, La. (1921–24) and to commercial work by the Keystone Aircraft Corporation.

REEVES, G. I. (220)
THE CONTROL OF THE ALFALFA WEEVIL [HYPERA POSTICA]. U. S. Dept. Agr. Farmers' Bul. 1528, 22 pp., illus. Washington, D. C., 1927. 1 Ag84F

Airplane dusting with calcium arsenate not recommended until more uniform results have been obtained.

REISSIG. (221)
EIN BEITRAG ZUR FLUGZEUGBEKÄMPFUNG VON FORSTSCHÄDLINGEN. Deut. Forstwirt 9 (34): 193–194. Mar. 2, 1927. Duke Univ. Libr.

Discusses dusting against *Bupalus piniarius* in Oberpfalz in 1926. Agrees with Dr. Wolff that the use of small airships instead of planes would give a more uniform deposit of the insecticide.

——— (222)
BEOBACHTUNGEN UND ERFAHRUNGEN BEI DER SPANNERBEKÄMPFUNG MITTELS FLUGZEUGS IM JAHRE 1926. Forstwiss. Centbl. 71 (3): 81–89, illus. Feb. 1, 1927. 99.8 F775

The use of airplanes in combating *Bupalus piniarius* in 1926.

About 2,500 acres of forest in Oberpfalz were dusted. The better of two proprietary arsenicals used killed the larvae within 24 hr. Dusting from the ground is preferable under some conditions. A small airship might prove more satisfactory than the airplane.

RUSSKAĬA SOVETSKAĬA FEDERATIVNAĬA SOT͡SIALISTICHESKAĬA RESPUBLIKA. OTDEL ZASHCHITY RASTENIĬ OT VREDITELEĬ. NAUCHNOISSLEDOVATEL'SKAĬA LABORATORIĬA OTRAVLĬAĬU͡SHCHIKH VESHCHESTV. (223)
TRUDY [REPORT]. Pts. i, iii, ed. by A. P. Adrianov, I. A. Parfent'ev, and G. D. Ugrîumov. 106 pp., 112 pp. Leningrad, 1927, 1928. [In Russian.] 391.9 R92

Research at the Laboratory for the Study of Poison Substances of the Plant Protection Department of the People's Commissariat of Agriculture, R. S. F. S. R.

For contents *see* items 205, 218, 228, 229, 255, 256, 257, 262, 263, 267, 275, 276, 277, 278.

SCHIMITSCHEK, E. (224)
DIE VERWENDUNG DES FLUGZEUGES ZUR INSEKTENBEKÄMPFUNG. Wien. Allg. Forst– u. Jagd. Ztg. 45 (16): [93]–94. Apr. 22, 1927. 99.8 Oe82

Reviews German work in dusting from airplanes against forest pests. Discusses difficulties, such as poor adherence of dust, unfavorable weather conditions, irregular terrain over which planes must fly at low altitudes, and the danger of destroying beneficial parasites.

TAYLOR, E. H. (225)
FARMING FROM THE AIR. Country Gent. 92 (11): 3–5, 41, illus. November 1927. 6 C833

A popular, well-illustrated article dealing with protection from forest fires and airplane dusting against various crop pests.

TRAPPMANN, W. (226)
SCHÄDLINGSBEKÄMPFUNG. GRUNDLAGEN UND METHODEN IN PFLANZENSCHUTZ. 440 pp., illus. Leipzig, S. Hirzel, 1927. (Chemie und Technik der Gegenwart, herausgegeben von Professor Dr. Walther Roth in Coethen, v. 7.) 423 T682

Airplane dusting, pp. 267–270.

UNITED STATES DEPARTMENT OF AGRICULTURE. (227)
DEPARTMENT COMPLETES EMERGENCY EXPERIMENT. U. S. Dept. Agr. Off. Rec. 6 (50): 3, 8. Dec. 14, 1927. 1 Ag840r

One of the emergency needs following the Mississippi River flood of 1927 was the providing of borer-free seed cane for the flooded area. The attempt to secure this through the dusting of 5,000 acres of sugarcane with sodium fluosilicate distributed by airplane could not be considered a success.

VYSHELESSKAÎA, N. S. (228)
OB OTNOSHENII SARANCHI K OPYLIVAEMOÏ ÎADAMI RASTITEL'NOSTI [ON THE BEHAVIOR OF LOCUSTS AMONG THE DUSTED PLANTS]. R. S. F. S. R. Otd. Zashch. Rast. ot Vred. Nauch.-Issled. Lab. Otravl. Veshch. Trudy, pt. I, p. 87. Leningrad, 1927. [In Russian. English summary, p. 87.] 391.9 R92

Also *in* Zashch. Rast. 3 (6): 533. December 1926, published 1927. 421 D36

Locusts avoid plants dusted with sodium arsenite and paris green. Leaves dusted with chalk, lime, sulfur, and calcium arsenate are eaten readily.

——— (229)
OPYTY S PRILIPAEMOST'IU INSEKTITSIDOV I PRIMESEÏ [EXPERIMENTS ON THE ADHESIVE PROPERTY OF INSECTICIDES AND THEIR ADMIXTURES]. R. S. F. S. R. Otd. Zashch. Rast. ot Vred. Nauch.-Issled. Lab. Otravl. Veshch. Trudy, pt. I, pp. 88–90. Leningrad, 1927. [In Russian. English summary, p. 90.] 391.9 R92

Also *in* Zashch. Rast. 3 (6): 534–536. December 1926, published 1927. 421 D36

Experiments made by the aviochemical expedition show that, if plants are dusted when dew is present, the insecticide adheres well even under adverse weather conditions, such as wind or rain.

WILLIAMS, L. L., JR., and COOK, S. S. (230)
PARIS GREEN APPLIED BY AIRPLANE IN THE CONTROL OF ANOPHELES PRODUCTION. U. S. Pub. Health Serv. Rpts. 62 (7): 459–480, illus. Feb. 18, 1927. 151.65 P96

In 1926 paris green was applied by airplane over marshes around Quantico, Va. Hydrated lime and powdered soapstone were used as carriers. With wind velocities not over 4 miles per hr. and from a height of 100 ft. or less, a mixture of 1 lb. of paris green and 3 lb. of carrier was effective. With stronger winds and from a height of over 100 ft., a 50/50 mixture was satisfactory. Only the genus *Anopheles* was affected. One pound of paris green per acre was found an effective dose. When breeding was heavy, it was necessary to dust at weekly intervals. The materials used cost $0.724 per acre.

References.

*WOLFF, M. (231)
BEMERKUNGEN ZUR THEORIE UND PRAXIS DES ARSENBEFLUGES. Märkischer Forstver. Jahresber. (1927) 49: 38–51.

WOOLMAN, C. E. (232)
DUSTING CROPS BY AIRPLANE FOR CONTROL OF INSECTS. Internatl. Soc. Sugar Cane Technol. Conf. 2, Havana, 1927. Proc., pp. 63–66. 65.9 In84

Reviews the history of airplane dusting and cites results with cotton, sugarcane, pecan groves, and forest trees. Qualifications of a satisfactory airplane are: It must be fast and yet have a slow landing speed; it must be easily maneuvered but able to carry a heavy load; it must be light yet strong. An ample power reserve is desirable when approaching trees 100 ft. high at 100 miles per hr. The hopper feed must permit application of the dust in a ratio in proportion to the speed of the plane.

WRIGHT, D. (233)
THE APPLICATION OF INSECTICIDES BY AEROPLANE. Inst. Aeronaut. Engin. [London]. Jour. 1 (8): 45–56. August 1927. Natl. Advisory Com. for Aeronaut. Libr.

Discussion by Mr. Raynham and Major Hemming, with a reply by Mr. Wright, pp. 56–58.

Reviews control of *Alabama argillacea*, locusts, forest insects, and mosquitoes. Discusses various types of dusting hoppers, insecticides, types of planes used, and technical problems of application. Considers possibilities for use of the airplane in the British Empire. Acknowledges the assistance of J. L. Webb of the U. S. Department of Agriculture.

726508—47——3

ZAKHAROV, L. Z. (234)
K VOPROSU O KONTAKTNOM DEĬSTVII PREPARATOV MYSH'IAKA NA PERELETNUIU SARANCHU [CONCERNING THE CONTACT ACTION OF ARSENICAL PREPARATIONS ON LOCUSTA MIGRATORIA]. Sev. Kavkaz. Kraev. Sta. Zashch. Rast. Izv. 3: 197–203. 1927. [In Russian. German summary, p. 203.] 423.92 Se8

Describes experiments in testing sodium arsenite, calcium arsenate, and paris green, conducted in the summer of 1925 at the Prikumsk reed beds at the suggestion of P. A. Sviridenko, leader of the first aviochemical expedition. Results were not to be considered as final, but should serve as a basis for future investigations.

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ANONYMOUS. (235)
AEROPLAN OCH INSEKTSHÄRJNINGAR [THE AIRPLANE AND INSECT INJURY]. Skogen 15 (15): 409. Aug. 1, 1928. [In Swedish.] 99.8 Sk51

General article with especial reference to German experiments with Esturmit.

——— (236)
INSECTICIDE DUSTING BY AIRPLANES. Aircraft Year Book 1928: 107–110, illus. 333.8 Ai72

——— (237)
STRANGE USES FOR THE AIRPLANE. Lit. Digest 96 (7): 56, 58. Feb. 18, 1928. Libr. Cong.

Quotes from Associated Press dispatch from Croyden, England.

BALLOU, B. (238)
SULPHURING THE VINEYARD BY AIRPLANE. Calif. Grape Grower 9 (8): 14. Aug. 1, 1928. 95.8 C122

A letter describing operation and equipment used.

BLANK-WEISSBERG, S. (239)
DIE BEKÄMPFUNG DES ANOPHELISMUS IN POLEN IM JAHRE 1927. Polski Pismo Ent. 6 (3/4): 237–248, illus. May 15, 1928. 421 P76

Tests were made in the use of a hydroplane to distribute paris green. The difficulty encountered in adapting a suitable distributor to the plane has been overcome, and it is recommended that the work be continued.

BOX, H. E. (240)
OBSERVATIONS UPON LIXOPHAGA DIATRAEAE, TOWNSEND, A TACHINID PARASITE OF DIATRAEA SACCHARALIS, FABR., IN PORTO RICO. Bul. Ent. Res. 19 (1): 1–6, illus. August 1928. 421 B87

Recommends transportation of the parasites from Cuba by airplane and believes that this would probably raise the survival rate from 33 percent to 100 percent.

BÜLOW, U. VON. (241)
DER KAMPF MIT DER NONNE IN DEN OBERFÖRSTEREIEN STRELITZ UND LANGHAGEN IN DEN JAHREN 1926 UND 1927. Deut. Forstwirt 10 (48): 265–267. Mar. 31, 1928. Duke Univ. Libr.

Describes experiments in arsenical dusting from airplanes carried out by the firms Merck-Darmstadt and Junkers against *Lymantria monacha*. In one test a Junkers-Flugzeug D82 distributed 11,355 kg. of Esturmit over 227.1 ha. in 39 flights. In another experiment a Junkers Ganzmetallflugzeug D1125 was used to cover 200 ha. of woods with Forstesturmit. Both operations were successful, and neither preparation caused damage to man, cattle, or game.

COMBS, O. B. (242)
THE AIRPLANE IN INSECT CONTROL. Purdue Agr. 23 (3): 64, 74, illus. December 1928. 6 P97

Outlines briefly the work already done, equipment required, and future possibilities.

Cook, S. S., and Williams, L. L., Jr. (243)
AIRPLANES AND PARIS GREEN IN CONTROL OF ANOPHELES PRODUCTION. South. Med. Jour. 21 (9): 754–759, illus. September 1928. U. S. Natl. Inst. Health Libr.

Discussion, pp. 759–760.

Work done at Quantico, Va., using paris green diluted 25, 28, 33, and 50 percent (by weight) with powdered soapstone. The 33 percent dilution, applied at the rate of 1 lb. of paris green per acre, was the most satisfactory. Good distribution was obtained in a dead calm from a height of 150 to 200 ft. above the surface, and also in 10- or 12-mile breezes from a height of 25 to 40 ft. Comparative charts show conditions in treated and untreated areas. Paris green requires no agitator and can be distributed in a simple hopper from almost any type of plane. The mixture penetrated all types of vegetation. The cost of material was about 70c per acre per season.

Eidmann, H., and Berwig. W. (244)
UNTERSUCHUNGEN ÜBER PHYSIKALISCHE EIGENSCHAFTEN, INSBESONDERE DIE HAFTFÄHIGKEIT, VON ARSENBESTÄUBUNGSMITTELN. Fortwiss. Centbl. 50 (16): 529–542. Aug. 15, 1928; 50 (17): 575–586, illus. Sept. 1, 1928. 99.8 F775

Investigations on the physical properties of arsenical dust insecticides showed that a satisfactory dust must have: (1) toxicity for insects at low strengths, (2) great adhesive power, (3) small particle size, (4) nonseparability of components. The cost must also be reasonable. Gives detailed description of tests with seven commercial products, French chalk, and sulfur. Before dusting, tests must be made with each insect to be controlled, paying attention to time of molting or pupation.

Escherich, K. (245)
DER HEUTIGE STAND DER ARSENBEKÄMPFUNG DER FORSTSCHÄDLINGE MITTELS FLUGZEUG. Forstwiss. Centbl. 50(13): 421–436. July 1, 1928. 99.8 F775

Gives summary of airplane work in various countries and details of use in Germany against defoliating insects. Different insects and also different stages of the same species react differently to arsenic. The best results have been obtained against *Lymantria monacha* and the poorest against *Melolontha melolontha*. The distribution of the insecticide varies with the physical structure of the dust and the type of hopper carried. The great practical value of the method could be further increased by improved techniques.

Felt, E. P. (246)
DISPERSAL OF INSECTS BY AIR CURRENTS. N. Y. State Mus. Bul. 274: 59–129. April 1928. 500 N48B

Summarizes data on aerial insect populations and reports airplane trap collection of *Mesogramma*, *Hylemya cilicrura*, and *Chrysotus* at 3,000- to 1,000-ft. heights. References, pp. 125–129.

Fracker, S. B., and Granovsky, A. A. (247)
AIRPLANE DUSTING TO CONTROL THE HEMLOCK SPAN WORM. Jour. Forestry 26 (1): 12–33, illus. January 1928. 99.8 F768

Detailed account of airplane dusting against *Lambdina fiscellaria* Guenée over 715 acres of hemlock and balsam forest in Peninsula State Park, Wis. The plane, a Special Standard adapted for dusting, was supplied on contract by the Decatur Aircraft Co. The engine was a Curtiss OXX6, 100 hp. With a hopper opening of 7 by 27 in., dust was released at the rate of 250 lb. in 4 miles and satisfactorily covered a strip 1½ rods wide. No evidence of electrification was found. Pure calcium arsenate, used at the rate of 20 lb. per acre, gave an apparent mortality of from 60 to 90 percent. This percentage was obtained by comparison of branches before and after dusting and by catching poisoned larvae below infested trees. The average total cost was $7.04 per acre for labor and material.

References.

GOESCH. (248)
ZUR KIEFERNSPANNERBEKÄMPFUNG. ERWIDERUNG AUF DEN ARTIKEL VON PROFESSOR DR. WOLFF. Deut. Forstwirt 10 (111): 709–711. Nov. 6, 1928. Duke Univ. Libr.

Declares, in reply to Dr. Wolff's article, that he never opposed the aviochemical method in general, but only as used against *Bupalus piniarius* because it has never resulted in more effective control of this pest than less expensive measures. If complete control could be assured by use of the airplane, he would be the first to support it.

——— (249)
ZUR "LETZEN WARNUNG" VON PROFESSOR DR. WOLFF. Deut. Forstwirt 10 (85): 512. Aug. 7, 1928. Duke Univ. Libr.

Criticizes Dr. Wolff's article, and points out that the airplane method has not yet been completely successful. The cost is too great to justify partial success. Cites difficulties caused by poor weather and imperfect technique.

HINDS, W. E. (250)
IMPORTANT COTTON INSECTS OF CENTRAL PERU. Jour. Econ. Ent. 21 (4): 545–551. August 1928. 421 J822

In 1926 the Peruvian cotton planters arranged with Huff Daland Dusters, Inc., of Louisiana to start airplane dusting operations against cotton leaf worms, *Anomis* spp. Climatic conditions were favorable for this type of work.

——— and SPENCER, H. (251)
PROGRESS REPORT FOR 1927. WORK ON CONTROL OF SUGAR CANE BORER [DIATRAEA SACCHARALIS] BY SILICOFLUORIDE DUSTS. La. Planter & Sugar Mfr. Co., Inc. Ref. Bk. of Sugar Indus. of World 6 (6): 63–64. July 1928. 65.8L932

A large number of dusts were tested, and many gave a higher percentage of borer mortality than the standard dust used in 1926 and with less burning. Authors believe that the sodium fluosilicate type of burning does not permanently injure the cane. Better results were obtained with a dust ground to pass through a 500-mesh screen than with the coarser commercial forms. In general, the addition of a diluent decreases percentage of mortality in direct proportion to amount of diluent added.

HOLLOWAY, T. E., HALEY, W. E., and INGRAM, J. W. (252)
THE APPLICATION OF SODIUM FLUOSILICATE BY AIRPLANE IN AN ATTEMPT TO CONTROL THE SUGAR-CANE MOTH BORER [DIATRAEA SACCHARALIS]. U. S. Dept. Agr. Cir. 45, 7 pp. Washington, D. C., 1928. 1 Ag84C

Five thousand acres of sugarcane in Louisiana were dusted from one to three times with two different brands of sodium fluosilicate. The rate of application was 16 lb. per acre. Taking into account a natural mortality of 8.6 percent, the net mortality due to the insecticide was 19.6 percent of larvae in the stalks. The net kill of small larvae outside the stalks was 35.6 percent. Thirteen experiments at various places failed to indicate control, presumably on account of the low percentage of the kill and the high reproduction rate of the insect. The sodium fluosilicate caused serious burning, resulting in a loss of from 1 to 2.5 tons per acre. Cost of materials of application was about $7.80 per acre.

KAZANSKIĬ, K. A. (253)
KEDROVYĬ SHELKOPRÎAD (DENDROLIMUS SIBIRICUS TSHTV.) KAK VREDITEL' LESOV BURÎATO-MONGOL'SKOĬ RESPUBLIKI [DENDROLIMUS SIBIRICUS, TSHTV., AS A FOREST PEST IN THE BURYAT-MONGOL REPUBLIC]. Zashch. Rast. 4 (6): 861–915, illus. December 1927, published 1928. [In Russian.] 421 D36

Also published separately with a summary in English.

Deals largely with life history of the insect and damage done. Author considers airplane dusting the only possible method of control. Tests with sodium arsenite gave satisfactory results. All larvae were killed and there was no injury to trees.

KOLSTER. (254)
SIND DIE KOSTEN FÜR ARSENBESTÄUBUNGEN WIRTSCHAFTLICH GERECHTFERTIGT? Deut. Forstwirt 10 (97): 601–602. Sept. 18, 1928. Duke Univ. Libr.

Airplane dusting is justifiable when experts declare an emergency exists. Cost is no excuse for neglect, since provision will be made to extend financial aid to forest owners who undertake to dust their property.

KOROTKIKH, G. I. (255)
K VOPROSU O SHIRINE VOLNY INSEKTITSIDOV PRI AVIATSIONNO-KHIMICHESKOM METODE [ON THE WIDTH OF THE INSECTICIDE CLOUD OBTAINED BY THE AVIOCHEMICAL METHOD]. R. S. F. S. R. Otd. Zashch. Rast. ot Vred. Nauch.-Issled. Lab. Otravl. Veshch. Trud. 3: 67–76. Leningrad, 1928. [In Russian. English summary, pp. 111–112.] 391.9 R92

Also *in* Zashch. Rast. 5 (2): [213]–222. July 1928. 421 D36

The entire width of the dust strip does not depend on the amount of dust released from the plane in a unit of time, but the effective width may be dependent on the quantity released. The amount of poison shown by analysis to fall on a dusted leaf is consistently less than should theoretically be present. Recommends further study of physical qualities of poisons and amounts released in order to reduce this discrepancy.

——— (256)
LETNAIA SARANCHA I AVIO-KHIMICHESKIĬ METOD BOR'BY [THE MIGRATORY LOCUST AND THE AVIOCHEMICAL METHOD IN ITS CONTROL] R. S. F. S. R. Otd. Zashch. Rast. ot Vred. Nauch.-Issled. Lab. Otravl. Veshch. Trud. 3: 89–94. Leningrad, 1928. [In Russian. English summary, p. 112.] 391.9 R92

Also *in* Zashch. Rast. 5 (2): [235]–240. July 1928. 421 D36

Airplane dusting with sodium arsenite was used as an emergency measure in the control of adults of *Locusta migratoria* in the North Caucasus. Results were poor, and the author states that no more practical work should be tried until further experimental work has been done with types of insecticides and methods of application.

——— (257)
TEKHNICHESKIE ITOGI RABOT AVIO-KHIMICHESKOĬ ĖKSPEDITSII V DAGESTANE 1926 GODA [TECHNICAL RESULTS OF THE AVIOCHEMICAL EXPEDITION IN DAGESTAN IN 1926]. R. S. F. S. R. Otd. Zashch. Rast. ot Vred. Nauch.-Issled. Lab. Otravl. Veshch. Trud. 3: 23–40. Leningrad, 1928. [In Russian. English summary, p. 110.] 391.9 R92

Also *in* Zashch. Rast. 5 (2): [169]–186. July 1928. 421 D36

Tables outline technical points in handling planes and equipment as developed by the expedition.

KRIEG, H. (258)
IMKEREI UND ARSENBEKÄMPFUNG VON SCHAD-INSEKTEN. Bad. Bl. f. Angew. Ent. 2 (6): 326. December 1928. 421 B14

Refers to articles on the same subject by B. Geinitz (item 128) and gives additional information.

LEEDER, K. (259)
DIE INSEKTENBEKÄMPFUNG DURCH GIFT. Wien. Allg. Forst. u. Jagd. Ztg. 46 (43): [253]–254. Oct. 26, 1938. 99.8 Oe82

Popular account which emphasizes the damage to forest birds and animals as a result of airplane dusting with calcium arsenate.

MENZEL, R. (260)
BESTUIVINGSPROEF VANUIT EEN VLIEGTUIG OP DE THEEONDERNEMING MALABAR [AN EXPERIMENT IN DUSTING FROM AN AIRPLANE IN THE MALABAR TEA ESTATE]. Arch. v. Theecult. Nederland. Indië 2 (4): [276]–[284], illus. December 1928. [In Dutch. English summary, p. [284].] 68.18 Ea72

Tests were made in June 1928 of airplane dusting on an estate in Java. About 132 lb. of sulfur were dusted over 5 acres and resulted in a satisfactory coating of the tea bushes. This method is considered practicable over open ground which is not too hilly.

MIKHAĬLOV-SENKEVICH, I͡A. M. (261)

OTCHET O RABOTAKH TEKHNICHESKOĬ CHASTI AVIO-KHIMICHESKOĬ ĖKSPEDITSII PO BOR'BE S SHELKOPRI͡ADOM-MONASHENKOĬ V ICHALKOVSKOM LESNICHESTVE NIZHEGORODSKOĬ GUBERNII V 1926 GODU [THE REPORT OF THE WORK OF THE TECHNICAL SECTION OF THE AVIOCHEMICAL EXPEDITION FOR THE CONTROL OF THE NUN MOTH IN THE ICHALKOVSKY FORESTRY DIVISION OF THE GOVERNMENT OF NIZHNI NOVGOROD IN 1926]. R. S. F. S. R. Otd. Zashch. Rast. ot Vred. Nauch.-Issled. Lab. Otravl. Veshch. Trud. 3:99–108. Leningrad, 1928. [In Russian. English summary, p. 112.] 391.9 R92

Also *in* Zasch. Rast. 5 (2): [245]–254. July 1928. 421 D36

Gives a detailed account of the work and of the difficulties encountered in controlling *Lymantria monacha* under local conditions. The movement of the dust cloud is influenced first by the rotation of the propeller, but later depends more on the wind or air currents. Most favorable conditions were found in the early morning, when a descending air current carried the poison toward the ground. Later in the day the cloud hung in the air or was driven by the wind. Evening hours were less satisfactory as the air was too hot and the dust could not settle evenly.

PARFENT'EV, I. A. (262)

OTCHET OB OPYTNYKH RABOTAKH AVIO-KHIMICHESKOĬ ĖKSPEDITSII 1926 GODA [REPORT OF THE EXPERIMENTAL WORK OF THE AVIOCHEMICAL EXPEDITION OF 1926]. R. S. F. S. R. Otd. Zashch. Rast. ot Vred. Nauch.-Issled. Lab. Otravl. Veshch. Trud. 3:15–22. Leningrad, 1928. [In Russian. English summary, p. 109.] 391.9 R92

Also *in* Zashch. Rast. 5 (2): 161–168. July 1928. 421 D36

Outlines technical problems studied by the expedition in regard to toxicity of arsenates and arsenites of calcium and sodium, dusting vs. spraying, width of dust cloud, etc.

PUKHOV, B. A. (263)

AVIO-KHIMICHESKAI͡A OPYTNAI͡A ĖKSPEDITSII͡A PO BOR'BE S PERELETNOĬ SARANCHEĬ V DAGESTANE V 1926 GODU [THE AVIOCHEMICAL EXPERIMENTAL EXPEDITION FOR THE CONTROL OF THE MIGRATORY LOCUST IN DAGESTAN IN 1926]. R. S. F. S. R. Otd. Zashch. Rast. ot Vred. Nauch.-Issled. Lab. Otravl. Veshch. Trud. 3:5–13. Leningrad, 1928. [In Russian. English summary, p. 109.] 391.9 R92

Also *in* Zashch. Rast. 5 (2): [151]–159. July 1928. 421 D36

Account of the organization, technical equipment, and results of the expedition against *Locusta migratoria*. The value of the airplane has been demonstrated in locust control, especially in flooded areas where no other means are practicable.

RETTICH. (264)

DAS AUFTRETEN DER KIEFERNBUSCHHORNBLATTWESPE (LOPHYRUS PINI) IN BADEN 1927. Anz. f. Schädlingsk. 4 (2): 15–17, illus. Feb. 15, 1928. 421 An9

Excellent results were obtained by airplane with a proprietary arsenical dust against *Diprion pini* in the pine forests of Baden. The method was costly and required favorable weather. No injury was observed to bees, birds, or game.

——— (265)

DAS AUFTRETEN VON SCHÄDLICHEN FORSTINSEKTEN IN DEN KIEFERNBESTÄNDEN DES BADISCHEN UNTEREN RHEINTALS, IM BESONDEREN DER KIEFERNBUSCHHORNBLATTWESPE (LOPHYRUS PINI L.) IM JAHRE 1927. Bad. Bl. f. Angew. Ent. 2 (5): 249–261, illus. March 1928. 421 B14

Same work is reported in the paper cited above (item 264).

ROUBAUD, E. (266)

BIOLOGICAL RESEARCHES ON PYRAUSTA NUBILALIS HB. Internatl. Livestock Exposition, Internatl. Corn Borer Invest. Sci. Rpts. 1927/28: 1–40, illus. 1928. 430 In8Sc

Suggests the use of the airplane to distribute light mineral dusts.

SABIN-GUS, B. I. (267)
METEOROLICHESKIE NABLIUDENIIA V DAGESTANSKIKH PLAVNIAKH VO VREMIA AVIO-KHIMICHESKOĬ ÈKSPEDITSII LETOM 1926 GODA [METEOROLOGICAL OBSERVATIONS IN DAGESTAN DURING THE AVIOCHEMICAL EXPEDITION IN THE SUMMER OF 1926.] R. S. F. S. R. Otd. Zashch. Rast. ot Vred. Nauch.—Issled. Lab. Otravl. Veshch. Trud. 3:77–88. Leningrad, 1928. [In Russian.] 391.9 R92

Also *in* Zashch. Rast. 5 (2): [223]–243. July 1928. 421 D36

Weather conditions prevailing during the work of the expedition are discussed in detail.

SCHIMITSCHEK, E. (268)
FICHTENGESPINSTWESPE. Wien. Allg. Forst. u. Jagd.-Ztg. 46 (17): 100. Apr. 27, 1928. 99.8 Oe82

Refers to damage done in Moravia by *Cephalcia abietis* and advises airplane dusting with arsenicals where its parasites are not numerous.

SOKOLOV, P. T. (269)
K VOPROSU O KHIMICHESKOĬ BOR'BE S SARANCHEĬ [IN REGARD TO THE CHEMICAL CONTROL OF LOCUSTS]. Sev. Kavkaz. Kraev. Sta. Zashch. Rast. Izv. 4, pp. 122–126. 1928. [In Russian, German summary, p. 126.] 423.92 Se8

The chemist of the 1st Aviochemical Expedition for the Control of *Locusta migratoria* in North Caucasus, 1925, discusses the effectiveness of sodium arsenite, calcium arsenate, and paris green, and the minimum dosage of poison required for locust mortality. Also urges careful usage of chemical terminology in naming insecticides.

SWAINE, J. M. (270)
FOREST ENTOMOLOGY AND ITS DEVELOPMENT IN CANADA. Canada Dept. Agr. Pam. 97, 20 pp. Ottawa, 1928. 7 C16Pa

Reports on an experiment in airplane dusting carried out near Westree in the Province of Ontario for control of *Archips fumiferana*. Unfavorable weather and an accident to the plane hampered the test, but valuable data were obtained for future work. Also states that plans have been made for dusting against the hemlock looper, *Lambdina fiscellaria*, using calcium arsenate 20 to 30 lb. per acre.

——— (271)
PROGRESS IN FOREST INSECT CONTROL IN CANADA. Pulp and Paper Mag. Canada 26 (15): 500–502. Apr. 12, 1928. 302.8 P96

Also *in* Forestry Chron. 4 (1): [35–40]. February 1928. [Processed.] 99.8 F7623

Tests were made with airplane dusting against *Archips fumiferana* on Cape Breton Island in 1927, a cooperative project between the Entomological Branch of the Canadian Department of Agriculture and the Canadian Air Service. Difficulties encountered were: (1) difference in the time at which spruce and balsam buds open; (2) unfavorable weather; (3) difficulty in distinguishing boundary markers; (4) uneven liberation of dust from the hopper. These defects were overcome too late in the season to finish treating the plots, but the experience gained should make future work practicable.

TEMPEL, W. (272)
UEBER EINE ARSENBEKÄMPFUNG DER NONNENRAUPEN MITTELS FLUGZEUGEN. Kranke Pflanze 5 (9): 144–147, illus. September 1928. 464.8 K86

Control of the caterpillars of *Lymantria monacha* with arsenic by means of airplanes.

Between June 13 and July 20, 1928 about 4,000 acres in the forestry division of Tiergarten, Prussia, were dusted with a preparation containing 18 percent of arsenic pentoxide. Results were checked by observation of dead caterpillars and excreta collected on sheets of paper about 20 ft. square. Since the dust was very fine and adhered well, the heaviest deposit was on the crowns of the trees and very little fell to the ground. No injury to animals or birds was reported.

TRAUT, I. I. (273)

ITOGI MEROPRIÎATIĬ PO BOR'BE S SARANCHEĬ (LOCUSTA MIGRATORIA L.) V NIZHNEM POVOLZH'I V 1926/27 G. [RESULTS OF CONTROL MEASURES AGAINST LOCUSTA MIGRATORIA L. IN THE LOWER VOLGA REGION IN 1926/27]. Astrakhan (Prov.) Sta. Zashch. Rast. ot Vred. Zap. v. 2, No. 2, 16 pp. Astrakhan', 1928. [In Russian. English summary, p. 16.] 464.9 As8

The airplane method proved to be very expensive here since plans had been made by the Narkomzem for the dusting of 10 to 12 thousand ha., whereas only 3,631 ha. were actually dusted with sodium arsenite, at 2.7 kg. per ha.

UGRÎUMOV, G. D. (274)

K RABOTE OSOAVIAKHIMA NA SEL'SKOKHOZÎAĬSTVENNOM FRONTE [CONCERNING THE WORK OF OSOAVIAKHIM IN THE AGRICULTURAL FIELD]. Aviatsiîa i Khimiîa 1928, No. 8, pp. [23]–24. August 1928. [In Russian.] Libr. Cong.

Refers to aviochemical expeditions for the control of locusts in Kazakhstan and Dagestan. The value of calcium arsenite (the production of which was just beginning in U. S. S. R.) was also tested during these operations. Mentions the work of the Chuvash expedition against *Tortrix viridana* and the experimental work on arsenical compounds.

——— (275)

RABOTA NAUCHNO-ISSLEDOVATEL'SKOĬ LABORATORII OTRAVLÎAÎUSHCHIKH VESHCHESTV V OBLASTI IZUCHENIÎA KHIMICHESKOGO METODA BOR'BY S AZIATSKOĬ SARANCHEĬ V 1926 GODU [WORKS OF THE SCIENTIFIC RESEARCH LABORATORY FOR THE STUDY OF POISONOUS SUBSTANCES WITH REGARD TO CHEMICAL METHODS OF CONTROL OF THE ASIATIC LOCUST IN 1926]. R. S. F. S. R. Otd. Zashch. Rast. ot Vred. Nauch.-Issled. Lab. Otravl. Veshch. Trud. 3: 1–4. Leningrad, 1928. [In Russian.] 391.9 R92.

Also *in* Zashch. Rast. 5 (2): 147–150. July 1928. 421 D36

Brief general account of objectives of the experimental work with arsenical dusts carried out by expedition against *Locusta migratoria*.

VITKEVICH, V. I. (276)

O SKOROSTI VYPADENIÎA MELKIKH CHASTIÎS [ON THE VELOCITY OF FALLING OF SMALL PARTICLES]. R. S. F. S. R. Otd. Zashch. Rast. ot Vred. Nauch.-Issled. Lab. Otravl. Veshch. Trud. 3: 53–58. Leningrad, 1928. [In Russian.] 391.9 R92.

Also *in* Zashch. Rast. 5 (2): [199]–204. July 1928. 421D36

Comparative tests with various dusts. Owing to evenness of particles, paris green remains most compact, and large particles fall more slowly than similar particles of other materials. Because of their crystalline structure, all particles of sulfur fall more rapidly than those of chalk, lime, or gypsum. Damp dusts fall at a faster rate of speed than dry powders, paris green less evenly. Paris green and sodium arsenate do not combine when dropped together. Particles of paris green and calcium arsenate, however, unite and fall at the average rate for the two substances.

VYŠHELESSKAÎA, N. S., GALAKHOV, P. N., ZARRING, I. I., and PARFENT'EV, I. A. (277)

OPREDELENIE SHIRINY I KHARAKTERA PYLEVOĬ VOLNY PRI AVIO-METODE [THE DETERMINATION OF THE WIDTH AND CHARACTER OF THE DUST CLOUD IN AIRPLANE DUSTING]. R. S. F. S. R. Otd. Zashch. Rast. ot Vred. Nauch.-Issled. Lab. Otravl. Veshch. Trud. 3: 59–66. Leningrad, 1928. [In Russian. English summary, p. 111.] 391.9 R92.

Also *in* Zashch. Rast. 5 (2): [205]–212. July 1928. 421 D36.

The poison is unequally distributed throughout the dust cloud, the bulk falling along the line of flight. Slight precipitation does not wash the dust off the leaves. The planes flew at heights varying from 10 to 82 ft. Further studies are needed to determine the cause of the narrowness of the effective strip (about 110 yd.). A deposit of 0.0075 to 0.0333 mg. per cm.^{2} of sodium arsenite killed from 95 to 100 percent of the locusts.

——— Galakhov, P. N., Zarring, I. I., and Parfent'ev, I. A. (278)
izuchenie toksichnosti dlîa saranchi razlichnykh preparatov mysh'îâka [the study of the toxicity of different arsenic preparations for the locust]. R. S. F. S. R. Otd. Zashch. Rast. ot Vred. Nauch.-Issled. Lab. Otravl. Veshch. Trud. 3: 41–50. Leningrad, 1928. [In Russian. English summary, pp. 110–111.] 391.9 R92

Also *in* Zashch. Rast. 5 (2): [187]–196. July 1928. 421 D36

Detailed account of work done in 1926 by the Dagestan aviochemical expedition to determine lethal dose of arsenic per unit of leaf surface and amount of poisoned leaf eaten by locusts. Field tests showed that at least 1¾ lb. of sodium arsenite were required to an acre of leaf surface to produce 100 percent mortality in the 4th instar. Amount must be doubled for 5th instar. Gives results of laboratory experiments with baits containing arsenites and arsenates of sodium and calcium. Describes symptoms shown by poisoned locusts and gives a table of poison content of dead specimens.

Williams, R. H. (279)
suggested methods of control of locusts in iraq. 20 pp. Baghdad, Times press, 1928. 429 W67

Includes brief discussion of the use of airplanes.

Wolff, M. (280)
eine antwort auf den angriff von landforstmeister goesch gegen den arsenbeflug. Deut. Forstwirt 10 (105): 666–669. Oct. 16, 1928. Duke Univ. Libr.

Refutes the arguments of Goesch against airplane dusting and states that both scientific principles and practical experiments confirm his support of this control method.

——— (281)
eine letzte warnung! die kiefernspannergefahr in pommern. Deut. Forstwirt 10 (71): 397–398. June 19, 1928. Duke Univ. Libr.

Points out the serious situation resulting from damage caused by *Bupalus piniarius*, and urges the use of airplane dusting, irrespective of the cost.

——— (282)
die neuen junkers-ganzmetall-streuflugzeuge, typ w.33. Forstl. Wchnschr. Silva 16 (31): [241]–244, illus. Aug. 3, 1928.
Harvard Univ. Arnold Arboretum Libr.

Description of plane D 1125 used for dusting forest insects with Forstesturmit. Photographs show details of special attachments.

——— (283)
trefft rechtzeitig vorkehrungen für die kiefernblattwespenbekämpfung im september! Deut. Forstwirt 10 (88): 535. Aug. 17, 1928. Duke Univ. Libr.

Urges the owners of forest property to make contracts with the aviochemical dusting companies regardless of cost in order to control the pine sawfly, *Diprion pini*.

1929

Anonymous. (284)
airplane used to fight hemlock looper [lambdina fiscellaria]. West Coast Lumberman 56 (10): 10–11, illus. September 1929. 99.81 W52

Calcium arsenate, at the rate of 26 lb. per acre, was used to dust about 45 acres in British Columbia. The operation was very satisfactory and cost $472.23.

——— (285)
airplanes in entomology. Science 69 (1782, sup.): XII. Feb. 22, 1929. 470 Sci2

Aerial trap collection.

——— (286)
COMMAND-AIRE DUSTER. Aero Digest 15 (3): 160, illus. September 1929. Libr. Cong.

Detailed description of revised model of Command-Aire biplane (5–C–3), including tables of specifications, weights, and performances.

——— (287)
DEALING DEATH TO MOSQUITOES. U. S. Aviation Quart. 1: 19, 68. June/August 1929. Libr. Cong.

Gives text of a consular report by S. W. Honaker (released by the U. S. Department of Commerce, July 2, 1929) on airplane dusting experiments of U. S. Marine Corps in Haiti.

In St. Louis du Sud a mixture of 33⅓ percent of paris green and 66⅔ percent lime was used at an average rate of 1 lb. per acre. In a second test over rice fields near Bailey's Beach, 5 miles west of Port au Prince, the same mixture was also used. Both were successful, but the expense involved will make it necessary to use the method in conjunction with hand sprayers.

——— (288)
DUSTING FOR CITRUS THRIPS [SCIRTOTHRIPS CITRI]. Calif. Cult. 72 (22): 639, 643, illus. June 1, 1929. 6 C12

Deals with airplane dusting of orchards in the San Joaquin Valley, using sulfur at the rate of 75 to 100 lb. per acre. Three applications gave the best control. Describes action of hopper, agitator, and Ventura tube.

——— (289)
DIE FLUGZEUGBESTÄUBUNG VOM INDUSTRIELLEN STANDPUNKT. Deut. Forstwirt 11 (48): 260–261. Apr. 5, 1929. Duke Univ. Libr.

Deals with types of planes, weather conditions, and methods of application.

ANDERS, A. [K.] (290)
NA FRONTE BOR'BY S VREDITELÎAMI SEL'SKOGO KHOZÎAÎSTVA I LESOV [ON THE PEST CONTROL FRONT IN AGRICULTURE AND FORESTRY]. Aviatsiâ i Khimiâ 4(9): 8. September 1929. [In Russian.] Libr. Cong.

The accomplishments of the 1929 aviochemical expeditions are of special interest because new regions were treated for the first time and control measures were applied to forest pests as well as locusts. The Junker planes, J–13, gave excellent results in the control of *Dendrolimus sibiricus* in Irkutsk where 1,515 ha. were treated between May 8 and June 20. Mortality of the larvae reached 98 percent. In the Kuban region, from June 3 to July 7, dusting operations against locusts gave a mortality of almost 100 percent. The indifference of the peasants in Irkutsk had resulted in cases of insecticidal poisoning of cattle. In Kuban, an educational program preceded the dusting and there was no damage at all to livestock.

BODKIN, G. E. (291)
A NOTE ON THE UTILITY OF AERIAL PHOTOGRAPHY IN ENTOMOLOGICAL FIELD WORK. Bul. Ent. Res. 20 (4): 431, illus. December 1929. 421 B87

Planning operations for the control of *Chrysomphalus ficus* in northern Palestine was made difficult because of trouble encountered in locating the citrus gardens. Airplane photography was resorted to, and the 6 fumigation outfits were coordinated entirely from the map produced.

BOND, E. J (292)
THE AIRPLANE WARS AGAINST THE BOLL WEEVIL [ANTHONOMUS GRANDIS]. South. Aviation 1 (2): 15–16, illus. Oct. 15, 1929. Libr. Cong.

Gives general review and a description of work of Curtiss Flying Service of Texas, Inc.

BORCHERS, F. (293)
SOLL IN ZUKUNFT DER KIEFERNSPANNER NOCH MITTELS ARSEN BEKÄMPFT WERDEN? Deut. Forstwirt 11 (87): [581]–583. Aug. 20, 1929. Duke Univ. Libr.

A general discussion of airplane dusting with arsenicals against *Bupalus piniarius*. Chief difficulties result from unfavorable weather conditions and from uneven development of the caterpillars. Recommends preventive dust-

ing before the larvae are too far developed, to be followed by several later applications. Refers to results of work in the district of Lauenburg and in Poland.

BORCHERS, GEBRÜDER, AKTIENGESELLSCHAFT, GOSLAR. (294)
DIE BEKÄMPFUNG VON FORSTCHÄDLINGEN MIT BORCHERS "HERCYNIA"—KALKARSENAT. 16 pp., illus. Goslar, 1929. 423 B643

Treats of the factors influencing the use of a proprietary calcium arsenate in airplane dusting, and discusses results of successful experiments made in different parts of Germany against *Lymantria monacha.*

BRUMSHTEĬN, V. I., and DUKEL'SKAÎA, O. G. (295)
SANITARNO-GIGIENICHESKOE OBSLEDOVANIE AVIAKHIMEKSPEDITSIĬ NARKOMZEMA V KAZAKSTANE V 1928 G. [SANITARY-HYGIENIC INVESTIGATION OF THE AVIOCHEMICAL EXPEDITION OF THE PEOPLE'S COMMISSARIAT OF AGRICULTURE OF KAZAKHSTAN IN 1928]. Gigiena, Bezopasnost' i Patologiîa Truda 7 (10): 102–109, illus. 1929. [In Russian.] Libr. Cong.

Describes research work of expedition in the delta of Syr-Dar'îa River where dusting of locusts was in progress. Expedition tried to determine how arsenicals and methods of application affected various workers and to set up certain safety regulations for crew. Gives diagram of hopper and distributor.

BRUNN, G. (296)
DIE ERFOLGSKONTROLLE BEI ARSENBEFLÜGEN. Deut. Forstwirt 11 (112): 779–781. Nov. 15, 1929. Duke Univ. Libr.

Over 2,700 acres of forest in the district of Lüneburg were dusted by airplane with the arsenical product Hercynia FF. To check results, a count was made of excrement and dead caterpillars collected on paper placed beneath certain trees in both treated and untreated plots.

COAD, B. R. (297)
AIRPLANE DUSTING OF COTTON FIELDS PROVES EFFECTIVE, ECONOMICAL. U. S. Dept. Agr. Yearbook 1928: 117–120, illus. 1929. 1 Ag84Y

Historical summary of airplane dusting, including a discussion of the limitations and advantages.

——— (298)
ORGANIZATION AND PROGRESS OF PINK BOLLWORM [PECTINOPHORA GOSSYPIELLA] RESEARCH INVESTIGATIONS. Jour. Econ. Ent. 22 (5): 743–750. October 1929. 421 J822

Collection by means of airplanes equipped with traps showed that the moths are present at considerable altitudes and indicated that wind transportation may be an important factor in spread.

D., A. (299)
BOR'BA S KEDROVYM SHELKOPRÎADOM V KULATUKSKOM L-VE IRKUTSKOGO OKRUGA SIBKRAÎA [THE CAMPAIGN AGAINST THE CEDAR MOTH IN THE FOREST DISTRICT OF KULTUK, IRKUTSK REGION, SIBERIA]. Lesn. Khoz. i Lesn. Promysh. 7 (7): 73–74. July 1929. [In Russian.] Libr. Cong.

German abstract *in* Ztschr. f. Angew. Ent. 18 (1): 201. June 1931. 421 Z36

Outbreak of *Dendrolimus sibiricus* in eastern Siberia in 1921. Special attention is given to the airplane dusting method.

DEMUTH, W. (300)
DIE RATIO BEI DER BEKÄMPFUNG VON KIEFERNSPANNER UND GEN. Deut. Forstwirt 11 (107): 741–743. Oct. 29, 1929. Duke Univ. Libr.

Chiefly a discussion of the article by Dr. Wolff (item 344) on control of *Bupalus piniarius.* Stresses difficulties caused by weather conditions and recommends night flying.

ESCHERICH, K. (301)
FLUGZEUG UND MOTORVERSTÄUBER IM DIENSTE DER FORSTSCHÄDLINGSBEKÄMPFUNG. Deut. Forst. Ztg. 44 (4): 90–94. Jan. 25, 1929. 99.8 D48

The effectiveness of airplane dusting with arsenical compounds varies with the species of insect, and the cost is high.

——— (302)
DIE FLUGZEUGBESTÄUBUNG GEGEN FORSTSCHÄDLINGE. Deut. Gesell. f. Angew. Ent. Flugschr. 12, 60 pp., illus. Berlin, 1929. 420 D48

A detailed review of airplane dusting carried out in Germany. Successfully used against *Lymantria monacha*, *Diprion pini*, and *Tortrix viridana* but less satisfactory against *Bupalus piniarius*. The method is recommended only over large areas severely infested. Lists the proprietary forms of calcium arsenate used and the qualities to be looked for. Discusses apparatus, adhesiveness of dust, relation of weather conditions to dust behavior, and effect of the poison on bees and wildlife. Directions are given for observing and checking results. Gives a maximum day's work as about 150 ha. at an approximate cost of 70 M. per ha. References, pp. [58]–60.

FLOS. (303)
WAS KÖNNEN WIR GEGEN DEN KIEFERNSPANNER TUN? Deut. Forstwirt 11 (50): [273]–277. Apr. 16, 1929; 11 (51): [281]–285. Apr. 21, 1929. Duke Univ. Libr.

A review of literature with a report on the author's own observations and work in Dessau on *Bupalus piniarius*. Includes an account of airplane dusting, but does not recommend either airplane or power dusting except as a last resort.

References.

GIBSON, A. (304)
FIGHTING THE INSECTS. Civ. Serv. Rev. [Ottawa] 1 (4): [282]–287, illus. March 1929. 423 G35

Airplane dusting, p. 286.

——— (305)
MOSQUITO SUPPRESSION IN CANADA IN 1928. N. J. Mosquito Extermin. Assoc. Proc. (1929) 16: 102–107. 1929. 420 N46

Discussion, p. 107.

Includes a report on experiments with pyrethrum and derris dusts applied by a small hand gun to test their value as larvicides for airplane application. Both dusts have the disadvantage of being easily carried away by the wind. Conflicting results were obtained with pyrethrum and the derris was even less efficient. To be at all effective both dusts should be used against immature larvae.

HARRISON, E. (306)
HISTORY AND ACTIVITIES OF LOCUSTS IN KENYA AND RELATIVE COSTS OF DESTRUCTION. Kenya Colony Dept. Agr. Bul. 9, 26 pp. Nairobi, 1929. 24 Ea72

Considers airplanes the only promising way of dealing with hoppers in inaccessible places. Military planes are not of great value, but the development of helicopters may make it possible to scout or drop poisoned bait or arsenite dusts. A good ground organization is essential. Refers to the possibility of developing a "destructive vibration" to be applied from a powerful airplane for use against flying and resting swarms.

KIENITZ. (307)
EIN NEUARTIGER VERSTÄUBUNGSAPPARAT FÜR DIE SCHÄDLINGSBEKÄMPFUNG MITTELS FLUGZEUGS. (VORLÄUFIGE MITTEILUNG.) Nachrichtenbl. f. den Deut. Pflanzenschutzdienst 9 (6): 47–48, illus. 1929. 464.9 N11

Detailed description, with diagram, of a container for obtaining a fine, even distribution of dust from an airplane.

KISLIUK, M., JR. (308)
AIR ROUTES, GERMAN DIRIGIBLE "GRAF ZEPPELIN" AND PLANT QUARANTINES. Ent. News 40 (6): 196–197. June 1929. 421 En88

Cites danger of pest introduction by aircraft and gives a list of insects and plant diseases intercepted on material from the Graf Zeppelin at Lakehurst, N. J.

——— (309)
PLANT QUARANTINE INSPECTION OF THE DIRIGIBLE "GRAF ZEPPELIN." (Scientific note) Jour. Econ. Ent. 22 (3): 594–595. June 1929.
421 J822

Points out danger of plant pest introduction, and lists insects and fungi intercepted on the Graf Zeppelin.

KNEEN, O. H. (310)
POISON FROM THE AIR; CROP DUSTING ONE OF THE BIG JOBS OF MODERN AVIATION. Airway Age 10 (8): 1218–1220, illus. August 1929. Libr. Cong.

Quotes Quick Aeroplane Dusters, Inc., Houston, on cost (25¢ to 60¢ per acre, depending on amount of poison used and size of tract). Three to five applications are normal in cotton fields. J–1 airplanes used with 150 to 180-hp. Hispano motors. The cost of installing dust hoppers (including bearings, gear box, tank, and all connections) was $700 for each plane. Reviews various dusting cases and cites advantages of the method.

KOMÁREK, J. (311)
DIE BEKÄMPFUNG DER NONNE VON FLUGZEUGEN MITTELS CALCIUM-ARSENAT. Cong. Internatl. de Zool., 10, Budapest, 1927 [Pub.] 1: 223–225. 1929.
410.9 In8

Control of *Lymantria monacha* by airplane dusting with calcium arsenate.

——— (312)
NONNENBEKÄMPFUNG MIT FLUGZEUGEN IM GEBIRGSTERRAIN VON SCHLESIEN. Deut. Gesell. f. Angew. Ent. Verhandl. (1928) 7: 81–86. 1929.
420 D48V

The difficult terrain forced selection of two small machines capable of taking off and landing on small areas. Only about 450 lb. of dust could be carried on one trip. Calcium arsenate, used 30 lb. per acre, is insufficient but will act as a check on ravages of *Lymantria monacha* until the polyhedral disease is far enough advanced. In view of the almost continuous winds, it was found best to use a heavy dust which would settle quickly. Early application is recommended. A repetition of the treatment the following year (1927), plus the effects of the polyhedral disease, produced a 100-percent mortality of larvae. The total cost was 19s. an acre.

KOROTKIKH, G. I. (313)
AVIATS̑IÎA V BOR'BE S VREDITELÎAMI [AVIATION IN PEST CONTROL]. Nashi Dostizheniÿa, 1929, No. 2, pp. 51–55. [In Russian.] Libr. Cong.

Outlines development in the U. S. S. R., where its use was first suggested in locust control. Discusses general principles involved in dusting with calcium arsenate and lists advantages of the airplane method. Predicts future use against plant diseases and malarial mosquitoes.

——— (314)
AVIATS̑IONNO-KHIMICHESKIE ÈKSPEDITS̑II 1929 GODA [AVIOCHEMICAL EXPEDITIONS OF 1929]. Aviatsiÿa i Khimiÿa 4 (5): [6]. May 1929. [In Russian.] Libr. Cong.

Refers to the four aviation units organized by Narkomzem and Osoaviakhim for the control of locusts and *Dendrolimus sibiricus*. The old type planes Konek Gorbunok were to be used, and the new planes, Y–2 and J–13, were to be tested; 25,000 ha. were to be treated against locusts and 3,000 ha. against the cedar moth. Airplane experiments to be carried out in the Moscow region for the control of mosquito larvae are also mentioned.

——— (315)
BOR'BA S OTRAVLENIÎAMI PRI RABOTE ISTREBITEL'NYKH AVIAKHIMEKSPEDITS̑II [THE FIGHT AGAINST POISONING IN THE CONTROL WORK OF THE AVIOCHEMICAL EXPEDITIONS]. Aviatsiÿa i Khimiÿa [4] (2): [3]–5, illus. February 1929. [In Russian.] Libr. Cong.

Describes the dangers resulting from work with chemicals in pest control and refers to the special precautions used in the handling of arsenicals by the aviation crews.

KOROTKOV, G. (316)
VOĬNA S SARANCHEĬ. KAZAKSTANSKAĬA AVIAKHIMEKSPEDITSIĬA 1929 G. [THE WAR WITH THE LOCUST. KAZAKHSTAN AVIOCHEMICAL EXPEDITION IN 1929]. Aviatsiĭa i Khimiĭa 4 (10): 11–12, illus. October 1929. [In Russian.] Libr. Cong.

The need for control work in the Dzhangaliĭskiĭ region was underestimated because of a telegraphic error, and the expedition was late in reaching this area. In spite of difficulties, 4,095 ha. were dusted, and a mortality of from 6,000 to 7,000 locusts per m.² was obtained. This achievement proves the importance of the airplane in locust control.

KRÜGER. (317)
SPANNER-BESTÄUBUNG IM STADTFORST WAREN-MECKLENBURG. Deut. Forst-Ztg. 44 (39): 1005–1008, illus. Sept. 27, 1929. 99.8 D48

Dusting from the ground against *Bupalus piniarius* is stated to be more effective than dusting from an airplane as the dust is first blown up through the trees and then falls again through them.

MARTIN, H. (318)
FLYGMASKINEN OCH SKADEINSKTERNA [THE AIRPLANE AND INJURIOUS INSECTS]. Skogen 16 (1): 7–9, illus. Jan. 1, 1929. [In Swedish.] 99.8 Sk51

Describes German work in the control of the pine moth, *Bupalus piniarius*, and the nun moth, *Lymantria monacha*. Merck's Esturmit was dusted from a Junkers F 13 at a height of 8 m. above the tops of the trees. Coverage was practically complete and infestations were promptly wiped out.

[MERINO, G.] (319)
[REPORT OF] PLANT PESTS CONTROL DIVISION. Philippine Dept. Agr. and Nat. Resources. Bur. Agr. Ann. Rpt. (1928) 28: 67–78, illus. 1929. 25 P54

Locust control campaign, pp. 67–69. An Aviation Unit was organized Mar. 15, 1928, and scouting and dusting work began at the end of June against *Locusta migratoria migratorioides*. In previously inaccessible areas a mortality of 70 percent was reached with calcium arsenate at the rate of 5½ lb. per acre.

METHNER. (320)
BEKÄMPFUNG DES KIEFERNSPANNERS MITTELS FLUGZEUG IN PRIVATFORSTEN DES KREISES LAUENBURG IN POMMERN. Deut. Forstwirt 11 (33): [173]–175. Feb. 27, 1929; 11 (34): [177]–179. Mar. 2, 1929. Duke Univ. Libr.

Airplane dusting with calcium arsenate against *Bupalus piniarius* was only a partial success because of unfavorable weather conditions and the uneven development of the caterpillars.

MIKAĬLOV-SENKEVICH, ÎA. [M.] (321)
NA ZASHCHITU SOVETSKIKH LESOV; PERVAĬA AVIA-KHIMICHESKAĬA ÈKSPEDITSIĬA PO BOR'BE S KEDROVYM SHELKOPRÎADOM [FOR THE PROTECTION OF SOVIET FORESTS; FIRST AVIOCHEMICAL EXPEDITION ON THE CONTROL OF THE CEDAR SILKWORM]. Aviatsiĭa i Khimiĭa 4 (10): 9–10, illus. October 1929. [In Russian.] Libr. Cong.

Describes *Dendrolimus sibiricus* and its destructive work in the Siberian forest. Dusting operations of the expedition were carried out from its headquarters in the village of Kultuk on the shores of Lake Baĭkal. Calcium arsenite was used, at the rate of 10 kg. per ha., over about 1,500 ha. During the course of the work, excursions were made to Kultuk by various organizations to study the aviochemical method.

MONTGOMERY, J. M. (322)
AIRSHIPS PRESENT HUGE PLANT QUARANTINE PROBLEM. Citrus Indus. 10 (3): 14, illus. March 1929. 80 C49

Urges more adequate inspection work at the Miami airport of the Pan American Airways. In February 1929 there were 623 parcels of contraband material taken from 152 planes.

MOZNETTE, G. F. (323)

AIRPLANE DUSTING EXPERIMENT AND RESULTS SECURED FOR THE CONTROL OF THE PECAN LEAF CASE-BEARER [ACROBASIS JUGLANDIS]. Natl. Pecan Exch. News 6 (1/2): 5–13, illus. January/February 1929. 92.69 N212

Five tests were made over a 26-acre grove near Putney, Ga., during the summer and early fall of 1928. In three tests the regular scab dust (20 percent monohydrated copper sulfate and 80 percent hydrated lime) was used, and in the other two tests a combination dust (20 percent monohydrated copper sulfate, 10 percent lead arsenate, and 70 percent hydrated lime). The results were not satisfactory, and the author recommends further study of the effects of meteorological conditions on the behavior of the dust cloud.

——— (324)

POOR RESULTS SECURED IN SOME PRELIMINARY AIRPLANE DUSTING OF PECANS FOR THE CONTROL OF THE PECAN LEAF CASE-BEARER ACROBASIS JUGLANDIS. Jour. Econ. Ent. 22 (5): 781–782. October 1929. 421 J822

A machine especially designed for dusting cotton was used and proved too light to discharge the larger doses needed for dusting trees. The effect of meteorological conditions on the behavior of the dust cloud should be studied. The dust lifted and then settled irregularly beyond the swath width. The extreme dispersion of the dust cloud over pecan trees 30 ft. high, even when lead arsenate was used at the rate of 80 lb. per acre, might possibly be overcome by further increasing the percentage of the poison in the mixture.

NEWELL, W., and MONTGOMERY, J. H. (325)

A NEW ANGLE TO PLANT QUARANTINE ACTIVITIES. Fla. State Hort. Soc. Proc. (1929) 42: 145–150. 81 F66

Discussion, pp. 150–151.

Development of air transportation has greatly increased the danger of pest introduction from the Tropics and South America. Plant quarantine agencies must organize to save Florida horticulture.

PACKARD, C. M. (326)

HESSIAN FLY (PHYTOPHAGA DESTRUCTOR) CONTROL IN THE UNITED STATES. Internatl. Ent. Cong., 4, Ithaca, N. Y., 1928, 2: [181]–190. 1929. 422 C76

Suggests the possibility of developing a cheap and efficient insecticide for airplane distribution over the wheat fields.

References.

PATTERSON, J. E. (327)

THE PANDORA MOTH [COLORADIA PANDORA], A PERIODIC PEST OF WESTERN PINE FORESTS. U. S. Dept. Agr. Tech. Bul. 137, 19 pp., illus. Washington, D. C., 1929. 1 Ag84Te

Includes suggestion that airplane dusting might be effective and reasonable in cost.

RHUMBLER, L. (328)

ZUR BEGIFTUNG DES KIEFERNSPANNERS (BUPALUS PINIARIUS L.) IN DER OBERFÖRSTEREI HERSFELD-OST 1926. Ztschr. f. Angew. Ent. 15 (1): [137]–158, illus. May 1929. 421 Z36

A detailed account of experimental airplane dusting with calcium arsenate against *Bupalus piniarius*. A study of larval feeding habits was made in order to determine the correct time to apply the dust to avoid its removal by wind or rain before consumption. Feeding was found to occur between 1 and 6 p. m., and to precede the main deposit of excreta by about 6 hr.

RITTMEYER. (329)

DIE BEKÄMPFUNG DER FORSTSCHÄDLINGE MITTELS FLUGZEUG. Wien. Allg. Forst- u. Jagd-Ztg. 47 (29): 170–171. July 19, 1929. 99.8 Oe82

Hercynia, a new calcium arsenate dust containing 10 to 12 percent arsenious acid, has proved superior to similar dusts for use against *Lymantria monacha*, *Bupalus piniarius*, and *Panolis flammea*. It is very fine, adheres well to foliage, is not easily washed off by rain, and is not poisonous to warm-blooded animals. Fifty kg. per ha. is recommended, and a small plane can treat 250 ha. per day in good weather.

RUKAVISHNIKOV, B. [I.] (330)
ORGANIZUEM AVIAKHIMBOR'BU S MALIÂRIĬNYM KOMAROM [WE ARE ORGANIZING AVIOCHEMICAL CONTROL OF THE MALARIA MOSQUITO]. Aviat͡siiâ i Khimiiâ 4 (11): 10. November 1929. [In Russian.] Libr. Cong.

Cites experiments of the Laboratory of Poisonous Substances and the Entomological Division of the Tropical Institute in dusting malaria mosquito larvae with paris green. Work was carried out on the Khrapunsk peat farm, 46 km. from Moscow. Results proved the superiority of the aviochemical method against malarial mosquitoes, and that nothing can take its place in the treatment of large, inaccessible areas.

SACHTLEBEN, H. (331)
DIE FORLEULE, PANOLIS FLAMMEA SCHIFF. Monog. zum Pflanzenschutz 3, ed. by H. Morstatt. 160 pp., illus. Berlin. J. Springer, 1929. 430 Sa12

Historical account of outbreaks and description of life history of the insect in Germany, including its parasites. Airplane dusting might prove successful, but further work with parasites and a study of control by forestry practices are advised.

References, pp. [150]–160.

SCHOTTE, H. (332)
FORSTSCHÄDLINGSBEKÄMPFUNG MITTELS FLUGZEUGEN. Ztschr. f. Angew. Chem. 42 (22): 635. June 1, 1929. 384 Z33

Summarizes briefly the history of airplane dusting and the factors necessary to its success.

SERGIEV, P. G. (333)
OTCHET O KOMANDIROVKE NA MALIÂRIĬNYE KURSY, ORGANIZOVANNYE GIGIENICHESKOĬ SEKT͡SIEĬ LIGI NAT͡SIĬ [A REPORT ON THE MALARIAL PROJECTS ORGANIZED BY THE HYGIENIC SECTION OF THE LEAGUE OF NATIONS]. Russ. Zhur. Trop. Med. 7 (6): 384–389. 1929; 7 (7): 439–448. 1929. [In Russian.] 448.8 R92

The second part of this paper discusses Italian antimalarial work. During the breeding season marshy places were dusted with paris green diluted 50 percent with dust. One lb. of paris green was used to 2¼ acres of water surface. In calm weather the plane flew at a height of about 65 to 90 ft. and in windy weather from about 49 to 65 ft.

STALLINGS, J. H. (334)
BOLL WEEVIL [ANTHONOMUS GRANDIS] control by airplane dusting. Mfrs. Rec. 96 (14): 79. Oct. 3, 1929. 297.8 M31

STOBROVSKIĬ, N. (335)
DIRIZHABL' PROTIV SARANCHI [A DIRIGIBLE AGAINST LOCUST]. Aviat͡siiâ i Khimiiâ [4] (2): 9. February 1929. [In Russian.] Libr. Cong.

Points out advantages of using dirigibles in pest control, and suggests that research and experiments be undertaken to continue the uncompleted work started by Dobrolet in 1925. Also refers to the effective use of dirigibles in New England against the "midges" (*Porthetria dispar*?).

THOMANN, H. (336)
DER GRAUE LÄRCHENWICKLER (SEMASIA DINIANA GN.). Naturf. Gesell. Graubündens. Jahresber. (1928/29) (n. s.) 67: 3-[45], illus. 1929. Natl. Mus. Libr.

As a supplementary measure, recommends airplane dusting with lead arsenate.

References.

THOMAS, F. L., OWEN, W. L., JR., GAINES, J. C., JR., and SHERMAN, F., 3D. (337)
BOLL WEEVIL CONTROL BY AIRPLANE DUSTING. Tex. Agr. Expt. Sta. Bul. 394, 40 pp., illus. College Station, 1929. 100 T31S

A complete discussion of experimental operations in Texas against *Anthonomus grandis*. Three to five applications of calcium arsenate were made, using from 5 to 8½ lb. per acre. The number of punctured squares was reduced by 50 percent 10 days after dusting. The cost was from 75¢ to $1 per acre. The method is justified when the infestation averages 15 percent early in the season or 20 percent later on, or when the price of cotton is high.

Small, detached areas are not as profitably treated as larger ones. It is particularly useful when wet ground hampers the ground machinery to such an extent that the required 5-day interval cannot be maintained between dustings. Gives detailed information on nozzles and types of machines.

VOELKEL, H. (338)

METHODEN ZUR PRÜFUNG VON PFLANZSCHUTZMITTELN. II. MITTEILUNG. DIE BESTIMMUNG DER HAFTFÄHIGKEIT VON STÄUBEMITTELN. Biol. Reichsanst. f. Land- u. Forstw. Arb. 17 (3): 253–272, illus. June 1929. 410.9 G31

Reviews the various methods of applying insecticidal dusts, including discussion of the qualities required for airplane use. Gives results of a series of tests on the adhesive properties of 78 materials to be used in cloud form. Confirms Borchers' statement that the carrier may form the bulk of the adhesive material. To what extent adhesiveness can be increased is doubtful.

——— (339)

ZUR METHODE DER BEKÄMPFUNG DER FORSTSCHÄDLINGE DURCH BESTÄUBUNG VOM FLUGZEUG AUS. Forstwiss. Centbl. 73 (11): 414–419. June 1, 1929. 99.8 F775

When airplane dusting is used against *Bupalus piniarius* a thin coating of arsenical dust should be applied, 16 to 24 lb. per acre, over the entire forest as soon as the first larvae are discovered. Larvae in the early stages are more susceptible to arsenic and therefore less poison is required. About 34,120 acres of forest were dusted in Germany in 1928 against various insects.

WILLIAMS, L. L., JR. (340)

CURRENT MALARIA STUDIES, WITH SPECIAL REFERENCE TO CONTROL MEASURES. U. S. Pub. Health Serv. Rpts. 44 (33): 2001–2004. 1929. 151.65 P96

Large sums of money are spent on clearing land before impounding water for hydroelectric purposes. Author suggests that such reservoirs be filled without clearing. Vegetation would die in a few years and during that time *Anopheles* breeding could be prevented by airplane dusting with paris green. The annual cost would be less than the interest on the capital spent in clearing.

WINTERS, S. R. (341)

AIR RAIDS ON MOSQUITOES. Aeronautics 4 (6): 26–27. June 1929. Libr. Cong.

Quoted in part *in* Lit. Digest 101 (13): 20, illus. June 29, 1929. Libr. Cong.

Reviews previous work briefly and describes successful test made by the South Carolina State Board of Health in cooperation with the U. S. Public Health Service, using a Ford transport monoplane lent by the Bureau of Aeronautics. A 500-acre pond was covered in two flights by the gridiron method, and 500 lb. of paris green were applied each trip.

——— (342)

PLANT PROTECTION BY AIRPLANE. Pop. Aviation and Aeronaut. 4 (2): 11–14, illus. February 1929. Libr. Cong.

Quoted in part *in* Lit. Digest 101 (4): 60, illus. Apr. 27, 1929. Libr. Cong.

Outlines history of airplane dusting. Reviews work of U. S. Bureau of Entomology against cotton boll weevil, *Anthonomus grandis*, at the Tallulah, La., Laboratory, and in control of mosquito breeding at Quantico, Va. Lists advantages and disadvantages; describes briefly the hoppers and the technique of dusting.

WOLCOTT, G. N. (343)

THE STATUS OF ECONOMIC ENTOMOLOGY IN PERU. Bul. Ent. Res. 20 (2): 225–231. August 1929. 421 B87

Includes mention of airplane dusting with calcium arsenate against *Anomis texana* and *Alabama argillacea*. In 1927/28 dust was applied to 80,000 acres. A proprietary insecticide, "polvos violeta," Merck's Si 26, is used against *Dysdercus ruficollis*.

726508—47——4

WOLFF, M. (344)
DER ERFOLG DER BEKÄMPFUNG DES KIEFERNSPANNERS MITTELS FLUGZEUG IN PRIVATFORSTEN DES KREISES LAUENBURG IN POMMERN NACH DEM DERZEITIGEN STANDE DER BEOBACHTUNGEN. Deut. Forstwirt 11 (96): [653]-655. Sept. 20, 1929; 11 (97): 663–665. Sept. 24, 1929. Duke Univ. Libr.

A general discussion of airplane dusting with arsenicals against *Bupalus piniarius* is followed by a detailed analysis of the results in the district of Lauenburg, Pomerania. Concludes that it is the only rational method of controlling infestations over large areas.

ZANDER, E. (345)
NAHRUNGSERWERB DER BIENEN UND SCHÄDLINGSBEKÄMPFUNG. Biene 67 (6): 172–174. June 1929. 424.8 B476

Distribution of crop poisons by airplanes probable cause of mortality among bees. Describes methods of testing bees for evidence of arsenical poisoning.

1930

ANONYMOUS. (346)
AIRPLANE DUSTING PROVES SUCCESSFUL IN CANADA AS METHOD OF CONTROLLING HEMLOCK LOOPER [LAMBDINA FISCELLARIA.]. U. S. Forest Serv. Forest Worker 6 (2): 21. March 1930. 1 F76Fw

——— (347)
AIRPLANES GIVE FOREIGN INSECT PESTS NEW WAY OF ENTERING U. S. U. S. Dept. Agr. Off. Rec. 9 (45): 8. Nov. 6, 1930. 1 Ag840r

Refers to statement of E. R. Sasscer following an inspection trip to Florida Coast.

——— (348)
LES PROGRÈS DE LA PULVÉRISATION D'INSECTICIDE PAR AVION. Aeronautique 12 (137): 383–384, illus. October 1930. Natl. Advisory Com. for Aeronaut. Libr.

Refers to the dusting operations carried out in Germany in 1925 by the firm, Junkers, which resulted in improvements to the hopper. Photographs show both original and improved hoppers.

——— (349)
UTILIZING THE AIRPLANE TO CONTROL PESTS. Citrus Leaves 10 (5): 8, illus. May 1930. 80 C492

Outlines dusting methods and states that the use of airplanes against citrus pests has not yet been proved economically sound.

AVVAKUMOV, N. V. (350)
AËROPLANY V BOR'BE S LUGOVYM MOTYL'KOM [AIRPLANES IN THE CONTROL OF THE MEADOW MOTH (LOXOSTEGE STICTICALIS)]. Sovet. Sakhar 1930, No. 19, pp. 1042–1045, illus. Oct. 28, 1930. [In Russian.] Libr. Cong.

In 1929, great losses to the sugar industry were caused by an infestation of *Loxostege sticticalis*. The Soûzsakhar ´sugar authority included airplane dusting in its control plans for 1930. A delay in the appearance of the moth afforded an opportunity for experimental work together with the control operations. Two airplanes made 71 flights with a total flight time of 26 hr., 8 min. (control work, 13 hr., 47 min.; experimental work, 6 hr., 41 min.; auxiliary flights, 5 hr., 40 min.). In 10 days' work, carried out between July 3 and 23, 452 ha. of sugar beets were dusted (37 on collective farms, 415 on state farms) and 1,909 kg. of calcium arsenate were used. Discusses productivity of the airplane, cost of operations, and defects in the dusting apparatus. Calcium arsenite should be supplanted by materials which do not burn the plants. Calcium arsenite, used 3 to 4 kg. per ha. gives a 40-percent mortality. An increase in dosage does not increase mortality rate but does increase injury to plants. The dosage of 3 to 4 kg. per ha. permits dusting of 40 to 50 ha. per hr. Only 20 to 25 ha. can be covered, at the same dosage, when lime is added in the proportion of 1:1.

BOOTH, L. (351)
THE DEVELOPMENT OF AERIAL COTTON DUSTING. South. Aviation 1 (9): 25–26, illus. May 15, 1930. Libr. Cong.

Refers to work of Wings, Inc., and gives list of commercial companies.

Bülow, A. von. (352)
FLUGZEUGBEKÄMPFUNG DES KIEFERNSPANNERS 1929. Deut. Forstwirt 12 (37): [221]-224. Mar. 25, 1930. Duke Univ. Libr.

Control of *Bupalus piniarius* in the Mecklenberg-Strelitz State Forest between Aug. 9 and Aug. 30, 1929. A Junker D. 1642, type W33 with special dusting equipment, was used in 73 flights over about 1,627 acres. The Merck calcium-arsenate preparation Forstesturmit was used on about 1,560 acres at the rate of approximately 44½ lb. per acre. Results were good. The non-arsenical contact preparation Forestit, for which Merck charged the same price, was tried on about 67 acres at the rate of 53 lb. per acre. It appeared to be more effective than arsenicals against the larvae.

Burt, B. C., and Dutt, G. R. (353)
THE DESERT LOCUST [SCHISTOCERCA GREGARIA] IN INDIA, 1929–1930. Agr. Jour. India. 25 (5): 417–425, illus., map. September 1930. 22 Ag83

It is not believed that the use of airplanes for either scouting or dusting is economical or practical.

Commins, M. J. (354)
COULD PUMPS SPRAY POISON BETTER THAN AIRPLANES? Canad. Woodlands Rev. 1 (11): 18. March 1930. 99.8 C163

Reply to article by J. M. Swaine (item 374). Author belives that airplane dusting is too dangerous and too costly.

Cook, S. S. (355)
MALARIA CONTROL IN HAITI. South. Med. Jour. 23 (5): 454–459. May 1930. U. S. Natl. Inst. Health Libr.

Mentions successful use of airplane dusting with paris green diluted 33 percent with slaked lime, and applied at the rate of 1 lb. of paris green per acre.

Galligan, F. A. (356)
COAST TAKES THE LEAD IN CROP DUSTING. BIG PRODUCERS ARE USING PLANES EXCLUSIVELY FOR PEST WARS; MANY SHIPS TO BE EMPLOYED IN 1931. Pacific Flyer 5 (5): 12, 17, illus. November 1930. Libr. Cong.

Hoerner, G. R. (357)
AERODUSTING ACTIVITIES IN ORCHARDS OF THE NORTHWEST. BETTER FRUIT 25 (3): 5–6. September 1930. 80 B46

Outlines the history of orchard dusting, and discusses its future and the problems involved.

Hubault, E. (358)
INVASIONS DE MACROLÉPIDOPTÈRES DANS L'EST DE LA FRANCE. MICROORGANISMES PARASITES DES INSECTES. Internatl. Cong. Forestry Expt. Stas. Proc. 1929: 631–642, illus. 1930. 99.9 In 807

Includes an account of airplane dusting against *Bupalus piniarius* over the Haguenau Forest.

References.

Kazanskiĭ, K. A. (359)
SOVETSKAĨA ĖKSPEDITSIIA PO ZASHCHITE RASTENIĬ OT VREDITELEĬ SEL. KHOZĨAĬSTVA V MONGOLII [THE SOVIET EXPEDITION FOR CONTROLLING PESTS INJURIOUS TO AGRICULTURE IN MONGOLIA . . . (REPORT 1929)]. 51 pp. Izdanie Burnarkomzema Verkhneudinsk, 1930. [In Russian. English summary, pp. 49–51.] 79 K18

At head of title: Narodnyĭ Komissariat Zemledelīa Burīat-Mongol'skoĭ A. S. S. R. Stantsiia Zashchity Rasteniĭ [People's Commissariat of Agriculture of the Burīat-Mongol Republic. Station of Plant Protection].

Includes discussion on control of *Porthetria dispar* in larch woodlands. The aviochemical method is not advised since the pest does not kill the trees, which put out new shoots the following spring, and because of the difficulty in organizing such a service under conditions in Mongolia.

Klein, J. (360)
AIRPLANES PROVIDE SPEEDY AND EFFICIENT PEST CONTROL. Calif. Cult. 74 (15): 434. Apr. 12, 1930. 6 C12

A brief explanation of equipment and methods. Various insects are mentioned, particularly *Erythroneura* sp.

KNEEN, O. H. (361)
WAR IN THE AIR—ON MOSQUITOES—USE OF PLANES MORE EFFICIENT—AFFORDS OPERATORS NEW SOURCE OF REVENUE. Airway Age 11 (7): 931–933, illus. July 1930. Libr. Cong.

Reviews successful tests at Quantico, Va., Bamberg, S. C., Haiti, etc. Quotes C. E. Woolman of the Delta Air Service, Inc., Monroe, La.

LASHTOVICHEV, V. (362)
AËROPLANY V BOR'BE S LUGOVYM MOTYL'KOM [AIRPLANES IN THE CONTROL OF LOXOSTEGE STICTICALIS]. Sovet. Sakhar 1930, No. 19, pp. 1040–1041. Oct. 28, 1930. [In Russian.] Libr. Cong.

Reports on experimental work on the sugar plantations of the Novo-Pokrovskiĭ Kombinat to determine the distribution and deposit of insecticidal dusts applied from airplanes. Graphs show the type of dust cloud resulting from flights against the wind, with the wind, across the wind, and in calm weather. Recommends dusting with the wind, although this does not solve the problem of even distribution. The latter can only be achieved by changes in the apparatus. Advocates the construction of additional dust vents in the wings of the plane, which would increase the width of the cloud and result in a more even distribution of the insecticide.

LATHROP, F. H., and NICKELS, C. B. (363)
A COMPARATIVE STUDY OF DUSTING BY MEANS OF AIRPLANE AND GROUND MACHINE FOR THE CONTROL OF THE BLUEBERRY MAGGOT [RHAGOLETIS POMONELLA]. U. S. Dept. Agr. Cir. 123, 14 pp., illus. Washington, D. C., 1930. 1 Ag84C

Results of airplane dusting in 1927 and 1928 in Washington County, Maine. Calcium arsenate was used, with the following specifications: (1) It must contain not less than 40 percent total arsenic pentoxide; (2) it should not contain more than 0.75 percent water-soluble arsenic; (3) it should have a density of between 80 and 100 cu. in. per lb. Application should be at the rate of 6 to 7 lb. per acre. Under ideal conditions results were as good as with ground machines, but under conditions usually prevailing the ground machines showed a better record. Heavy morning fogs cut down the time suitable for dusting to such an extent that the greater speed of airplane work did not compensate. Authors consider that the results of the experiments warrant tentative recommendation of this method.

NASH, A. H. (364)
"AEROPLANOS-POLVOREADOROS." LA UTILIZACIÓN DEL AEROPLANO EN LA DESINFECCIÓN DE LAS PLANTAS DE CULTIVO Y EN EL EXTERMINIO DE LOS MOSQUITOS CAUSANTES DE LA FIEBRE PALÚDICA. Hacienda 25 (10): 454–455, illus. October 1930. 6 H11

*NIKOLAEVSKIĬ. (365)
AVIAMETOD V BOR'BE S VREDITELÎAMI S.-KH. KUL'TUR V UZBEKSKOĬ SSR [AIRPLANE METHOD IN THE CONTROL OF AGRICULTURAL PESTS IN THE UZBEK SSR]. Za Rekonstruktsiiu Sel'sk. Khoz. 2 (8/9): 38–40. August/September 1930. [In Russian.]

Experiments in airplane broadcasting of bait for the control of locusts and grasshoppers were made in 1930 in Uzbekistan. The width of the swath laid averaged about 81 ft. With a side wind it was 261 ft. for dry bait and 135 ft. for moist bait. From a height of 330 ft. the swath was 330 ft. wide which would be a useful factor in treating infestations over large areas. Discusses the saving in time and labor.—Abstract *in* Rev. Appl. Ent. A 19: 371. June 1932.

NOLA, A. DI. (366)
LA LOTTA CONTRO LA MALARIA IN AVIAZIONE. Riv. Aeronautica 6 (7): 21–65, illus. July 1930. Libr. Cong.

Discusses the malarial situation at Italian airfields and includes a report on airplane dusting with paris green against *Anopheles* spp. The great extent of malarial areas in Italy makes the method feasible. The first experiments were made in the Monfalcone region. Equipment is described and illustrated. The dust was spread rapidly and very evenly. Malaria cases diminished in the treated areas.

RICHTER, P. E., JR. (367)
DUSTING. West. Flying 8 (6): 36–38, illus. December 1930. Libr. Cong.

Summarizes uses to which the airplane is put in pest control. Outlines pilot's job, qualities of a good pilot, and care of the plane. Pilots should carry insurance. Cites the ability of the airplane to cover large areas in a short space of time.

RINGNALDA, M. (368)
DUSTING—AN ENLARGED MARKET FOR AIRPLANES. West. Flying 7 (2): 53, 152, illus. February 1930. Libr. Cong.

Refers to efforts of Stearman Aircraft Co., Wichita, Kans., to widen markets. Describes Stearman dusting plane, with illustrations of hopper and agitator.

ROOKE, H. G. D. (369)
NOTE ON LOCUSTS IN IRAQ AND THE CONTROL MEASURES ADOPTED. Iraq Dept. Agr. Mem. 13, 13 pp., illus., map. Baghdad, Govt. Press, 1930. 22.5 M562M

Airplanes were found most useful in patrol work, especially in the desert areas.

RUKAVISHNIKOV, B. I. (370)
OPYTY PRIMENENIÎA AVIO-METODA V BOR'BE S MALÎARIĬNYM KOMAROM [EXPERIMENTS WITH AIRPLANE CONTROL OF ANOPHELES MACULIPENNIS]. Zashch. Rast. 6 (5/6): 775–776. March 1930. [In Russian]. 421 D36

Report on dusting experiments near Moscow in September 1929 using a mixture of paris green (AS_2O_3) and talc. The planes flew at a height of about 23 ft., laying an effective strip 110 to 137 yd. wide. Results were checked by means of dishes of water containing larvae of *Anopheles maculipennis* and *Culex pipiens*, which were placed at intervals on a line 110 yd. long at right angles to the line of flight. A 1:5 mixture, at the rate of 1 lb. of pure paris green per acre, killed all anopheline larvae in from 12 to 15 hr., and all *Culex* larvae in 24 hr. The 1:20 mixture, at the rate of 2.2 oz. of pure paris green per acre, gave 100-percent mortality of *Anopheles* and 22 percent of *Culex* larvae in 24 hr. Paris green and talc are more efficient than either sodium or calcium arsenite.

SCHOTTE, H. (371)
FORSTSCHÄDLINGSBEKÄMPFUNG MITTELS FLUGZEUG UND MOTORPULVERVERSTÄUBER DURCH "MERITOL." Ergeb. der Agr. Chem. . . . von F. Honcamp 2: 172–196, illus. 1930. 384 Er3

Discusses work against *Bupalus piniarius* with Meritol, a commercial product containing 20 percent calcium arsenate. The minimum dosage required is 50 kg. per ha., but the lethal dosage varies with the type of trees, age of caterpillars, and weather conditions encountered. Describes equipment and methods of application. Since airplane dusting is not suited to small forest areas, experiments were also made with ground dusters.

SENIOR-WHITE, R. A. (372)
MALARIA AT DELHI: ITS INCIDENCE AND CAUSATION. Rec. Malaria Survey India 1 (3): 291–335, illus. October 1930. 448.9 In2

Recommends flooding the Bela area and then dusting with paris green by means of airplanes.

References.

SHERMAN, F. (373)
RESULTS OF AIRPLANE DUSTING IN THE CONTROL OF COTTON BOLL WORM (HELIOTHIS OBSOLETA FAB.). Jour. Econ. Ent. 23 (5): 810–813, illus. October 1930. 421 J822

Calcium arsenate was used at the rate of 5 to 6 lb. per acre. The operation was not successful, and bollworms continued to increase on the dusted area throughout the season.

SWAINE, J. M. (374)

AIRPLANE DUSTING FOR THE CONTROL OF FOREST INSECTS IN CANADA. Canad. Woodlands Rev. 1 (9): 11–12, 30, 32, illus. January 1930. 99.8 C163

Partial reprint *in* Pulp and Paper Mag. Canada 29 (5): [123]–125, illus. Jan. 30, 1930. 302.8 P96

Covers the development of airplane control of forest pests with special mention of operations in Cape Breton Island and at Westree against the spruce budworm, *Archips fumiferana*, and on the north shore of the Gulf of St. Lawrence against the hemlock looper, *Lambdina fiscellaria*. In the last operation from 10 to 20 lb. of calcium arsenate were used per acre. Discusses costs of dusting and gives approximate total cost as $6.00 per acre, or $38.40 per sq. mile.

——— (375)

AIRPLANE DUSTING OPERATIONS FOR THE CONTROL OF DEFOLIATING INSECTS, CONDUCTED IN CO-OPERATION WITH THE DOMINION AIR SERVICE IN 1929. Canada. Dept. Natl. Defence. Rpt. on Civ. Aviation and Civ. Govt. Air Oper. 1929: 72–87. 1930. Natl. Advisory Com. for Aeronaut. Libr.

U. S. Department of Agriculture Library has reprint, 16 pp., illus. Ottawa, 1930. 423 Sw1

Extensive report on work done in Ontario. Forty pounds of calcium arsenate used against *Archips fumiferana* caused a larval reduction of 90 percent as against 66 percent from natural causes. The dust was continuously effective for about 2 weeks. Against *Lambdina fiscellaria* 18 lb. per acre gave 95 percent control. Dusting should begin as soon as the young larvae become abundant since smaller amounts of the poison are then sufficient. It is probable that 10 to 15 lb. per acre would control the first three instars. When calcium arsenate containing 40 percent As_2O_5 was used at the rate of 30 to 40 lb. per acre, burning of foliage occurred. It is probable that with a more adhesive mixed dust 20 percent As_2O_5 might be effective. The plane flying at 90 miles per hr. delivered about 350 lb. to the mile and laid down a strip 200 to 300 ft. wide on the ground (150 ft. in the tree tops). The strips should overlap to produce an even distribution. High humidity is essential to successful dusting, and the poison should be applied when dew is on the foliage. The approximate cost under commercial conditions is estimated at $6 per acre.

——— (376)

FIGHTING FOREST INSECTS FROM THE AIR. HOW THE BATTLE AGAINST THAT DREAD FOE OF THE FOREST—INSECT INFESTATIONS—IS BEING WAGED. Illus. Canad. Forest and Outdoors 26 (2): 71–72, illus. February 1930. 99.8 C16

Insects in Canadian forests cause an annual loss of many millions of dollars. Reviews development of airplane dusting with special reference to tests against *Archips fumiferana* and *Lambdina fiscellaria*.

——— (377)

FIGHTING INSECT PESTS FROM THE AIR. Canada; an Illus. Weekly Jour. 96 (1257): 203, illus. Feb. 15, 1930. Libr. Cong.

Cites pulpwood and timber losses caused by Canadian forest insects prior to 1927, when the first experiments in airplane dusting were started as a cooperative project between the Division of Forest Insects of the Dominion Entomological Service, the Dominion Air Service, and the Provincial Forestry Services of Nova Scotia, Quebec, and Ontario. Refers to successful dusting operations carried out in 1929 against the spruce budworm, *Archips fumiferana*, and the hemlock looper, *Lambdina fiscellaria*. Calcium arsenate, at the rate of 10 to 20 lb. per acre, gave 90-percent control. Concludes that airplane dusting can be profitably used in Canadian forests against insects which spread rapidly over large areas and feed in an exposed condition.

——— (378)

FURTHER OBSERVATIONS ON AIRPLANE DUSTING. Canad. Woodlands Rev. 2 (1): 28–29, illus. May 1930. 99.8 C163

Author replies to M. J. Commins (item 354). Defends cost of $6.00 per acre when contrasted with insect damage to valuable woodlands, and points out limitations of ground spraying.

SYTIN, V. A. (379)
NA FRONTE BOR'BY S VREDITELIAMI [ON THE BATTLEFRONT WITH PESTS]. Aviatsiia i Khimiia 1930, No. 8/9, pp. 10–11, illus. August/September 1930. [In Russian.] Libr. Cong.

Popular article discussing the accomplishments of the 15 planes detailed to various sections of the U. S. S. R.

TSYGANKOV [S. N.], ORLOV [P.], and GOLOVIZ[N]IN, [D.] (380)
PREDVARITEL'NOE SOOBSHCHENIE K PRIMENENIIU SAMOLETOV V BOR'BE S SARANCHEVYMI V USLOVIIAKH SR. AZII [PRELIMINARY REPORT ON THE USE OF AIRPLANES IN THE CONTROL OF LOCUSTS UNDER CONDITIONS IN CENTRAL ASIA]. Khlopkovoe Delo 9(12): 1366–1370. December 1930. [In Russian.) 72.8 K52

Broadcasting poison baits by airplane saves both time and labor and makes it possible to reach breeding places not otherwise accessible. Either moist or dry bait can be used. It is spread in swaths averaging 160 ft. in width while flying at a height of 160 ft. Six tons of dry bait can be evenly distributed over 900 acres in 6 hr.

WOLFF, M. (381)
FÜNF JAHRE ARSENKAMPF GEGEN FORSTSCHÄDLINGE. Ztschr. f. Forst– u. Jagdw. 62 (7/8): 465–497, illus. July/August 1930. 99.8 Z3

Reviews control work with arsenicals in Prussia, 1925 to 1929, against *Panolis flammea*, *Diprion pini*, *Lymantria monacha*, *Bupalus piniarius*, and *Tortrix viridana*. Both ground and airplane dusting were used. Forty-one out of seventy-one operations were successful. Complete extermination is not required, merely restoration of the natural balance of nature. There was no damage to game animals or birds, and useful parasitic insects were not destroyed. Airplanes are preferable where the area exceeds 100 ha. The Junkers type-W33 plane, 1929 dusting model, proved most satisfactory.

——— (382)
ZUR BEURTEILUNG DES ERFOLGES DER KIEFERNSPANNERBEKÄMPFUNG MIT ARSENFLUGZEUGEN IN POMMERN. Deut. Forstwirt 12(4): 20–21. Jan. 8, 1930. Duke Univ. Libr.

In reply to an article by Puttkamer-Barnow (Deut. Forstwirt 11(114): 798–799, Nov. 22, 1929) Dr. Wolff states that it is necessary to know the biology of insects in order to judge the effectiveness of control methods, and warns forest owners that dusting must be complete and correctly timed.

1931

ANONYMOUS. (383)
AERIAL WAR AGAINST LOOPER [LAMBDINA FISCELLARIA]. Timberman 32(9): 96. July 1931. 99.81 T484

Deals with work in progress in Nasel River District, Pacific County, Wash. Gives brief description of equipment, and states that the cost may be reduced to about $2.80 per acre.

——— (384)
AIRPLANE INSPECTION PRESENTS A PROBLEM. Calif. Dept. Agr. Monthly Bul. 20(2): [163]. February 1931. 2 C12M

Points out danger from inadequate inspection and difficulty of handling privately owned air traffic.

——— (385)
WHITE SPRUCE SAWFLY [NEODIPRION SP.] WREAKS HEAVY DAMAGE. Canad. Lumberman 51 (21): 22. Nov. 1, 1931. 99.81 C16

Aerial surveys were made of damage in the Gaspé Peninsula.

ALEKSANDROV, A. (386)
UDARIT' PO MALOVERAM I SABOTAZHNIKAM [TO CHECK THE SKEPTICS AND SABOTEURS]. Na Zashch. Sotsialist. Urozhaia 1931, No. 10, p. 33. October 1931. [In Russian.] Libr. Cong.

In spite of local opposition, the Transcaucasian aviation base successfully dusted 96,846 ha. in the month of September.

The value of the method was most evident in the locust control work where mortalities of from 90 to 100 percent were achieved.

ALFEROV, A. (387)
AVIOBOR'BA S SARANCHEĬ [AVIOCHEMICAL CONTROL OF LOCUSTS]. Na Zashch. Sotsialist. Urozhaĭa 1931, No. 12, p. 8. December 1931. [In Russian.] Libr. Cong.

Describes difficulties under which the aviation crew worked near Lake Kara-Kul' (150 km. west of Kzyl-orda), and the working plan for the next year.

BOWEN, J. W. (388)
FOREST INSECT PEST CONTROL BY AEROPLANE. A DESCRIPTION OF THE REMEDIAL MEASURES ADOPTED TO ERADICATE CASE MOTHS (CRYPTOTHELEA TENUIS) AT YARROWEE STATE PLANTATION, BALLARAT. 19 pp., illus. Melbourne, Victoria, H. J. Green, Govt. Printer, [1931?]. 423 B67

The height of the pine trees and the broken nature of the ground surface made the use of power dusters impracticable. Calcium arsenate (40 percent As_2O_5) was applied by airplane. In 2½ hr., 800 lb. were distributed over 200 acres from a hopper with a load capacity of 200 lb. Mortality varied from 90 to 99 percent. The cost of the operation was 13s. per acre. Diagrams with detailed explanations of the dusting apparatus are given.

BRUNN, G., and SCHWERDTFEGER, F. (389)
DIE BESTÄUBUNG DER NONNE IN DER PREUSSISCHEN STAATSOBERFÖRSTEREI FUHRBERG. Forstwiss. Centbl. 53 (21): 741–753, illus. Nov. 1, 1931. 99.8 F775

Airplane dusting with a 20 percent calcium arsenate mixture was successfully employed to control outbreak of *Lymantria monacha* in a 1,000-ha. pine forest in Prussia. Caterpillars are more susceptible after the 1st or 2d molt than immediately after hatching.

References, p. 731.

COAD, B. R. (390)
INSECTS CAPTURED BY AIRPLANE ARE FOUND AT SURPRISING HEIGHTS. U. S. Dept. Agr. Yearbook 1931: 320–323, illus. 1 Ag84Y

Short report on several hundred collections using a specially designed airplane trap. Over 1 square mile of ground near Talluah, La., there are about 25,000,000 insects in the upper air at all seasons of the year and under all conditions. Air dispersal of insects is an important factor in control.

DINGLER, M. (391)
DIE FORLEULE IN BAYERN. Deut. Forst-Ztg. 46 (27): [655]–656. July 3, 1931. 99.8 D48

Preferring not to rely on control of the larva of *Panolis flammea* by the fungus *Empusa* the Government of Middle Franconia announced a dusting program in May 1931. Calcium arsenate was to be applied by both ground and airplane equipment.

DUNN, M. B. (392)
THE JACK PINE SAWFLY [NEODIPRION SP.]. 3 pp., illus. Ottawa, 1931. (Canada Dept. Agr. Ent. Branch. Div. Forest Insects. Spec. Cir.) 423 C165

No practical method available for checking outbreaks. Suggests use of airplane dusting.

EIDMANN, H. (393)
ERFAHRUNGEN ÜBER DIE ARSENBEKÄMPFUNG VON FORSTSCHÄDLINGEN MITTELS MOTORVERSTÄUBER. Deut. Gesell. f. Angew. Ent. Verhandl. (1930) 8: 37–38. 1931. 420 D48V

Contends that, although large areas require airplane distribution, it is possible to treat small areas successfully from the ground.

ESCHERICH, K. (394)
DIE FORSTINSEKTEN MITTELEUROPAS, EIN LEHR- UND HANDBUCH. BD. 3. SPEZIELLER TEIL. ABT. 2. LEPIDOPTEROIDEA . . . 825 pp., illus. Berlin, Paul Parey, 1931. 423 Es2

Die chemische Bekämpfung mittels Flugzeug oder Motorverstäuber, pp. 82–100.

——— (395)
EIN NEUER FORTSCHRITT IN DER FORSTSCHÄDLINGSBEKÄMPFUNG. Forst. Wchnschr. Silva 19 (33): [257]–259. August 1931. Harvard Mus. Arnold Arboretum Libr.

Discusses advantages of Forestit over arsenicals, with especial reference to its effectiveness in dusting against the looper (*Lambdina fiscellaria*) and owl (*Panolis flammea*) moths.

——— (396)
EIN NEUES BEKÄMPFUNGSMITTEL GEGEN FORSTSCHÄDLINGE. Wien. Allg. Forst- u. Jagd-Ztg. 49 (40): 241–242. Oct. 2, 1931. 99.8 Oe82

Cites disadvantages of airplane dusting with calcium arsenate compounds as follows: (1) Rain within 3 or 4 days of dusting destroys value; (2) calcium arsenate is poisonous to warm-blooded animals: (3) it is very poisonous to bees. Refers to a new contact insecticide, Forestit, containing ingredients similar to Dalmation insect powder, which has proved satisfactory on smooth-skinned caterpillars. The precise effect on bees has not been determined.

FOLSOM, J. W. (397)
DAMAGE TO COTTON BY CRICKETS [GRYLLUS ASSIMILIS]. Jour. Econ. Ent. 24 (4): 807–815, illus. August 1931. 421 J822

Includes report on airplane-dusting tests. Both calcium arsenate and a calcium arsenate - paris green mixture (3:1), applied at the rate of 8 lb. per acre, produced a decrease in the number of crickets. The best time for dusting proved to be before sunrise when the air was calm and dew was on the plants.

GINSBURG, J. M. (398)
AIRPLANE APPLICATION OF LARVICIDE ON MOSQUITO BREEDING PLACES INACCESSIBLE FROM LAND. N. J. Agr. Expt. Sta. Ann. Rpt. (1930/31) 52: 173–176, illus. 100 N46S

The plane, furnished by the Unger Aircraft Corporation, was equipped with two 50-gal. tanks and the necessary discharge tubes. Both pyrethrum larvicide and a light fuel oil were tested. After installation of a removable hopper and Venturi tube, dusts consisting of peat, sawdust, kaolin, and similar inert carriers were used with light fuel oil, pyrethrum extract, and cresylic acid. Lack of an adequate stirring device caused an uneven discharge of dust from the hopper. Dusting was therefore discontinued because the liquid larvicides were believed to be more adaptable.

GRIFFITTS, T. H. D., and GRIFFITTS, J. J. (399)
MOSQUITOES TRANSPORTED BY AIRPLANES. STAINING METHOD USED IN DETERMINING THEIR IMPORTATION. U. S. Pub. Health Serv. Rpts. 46 (47): 2775–2782, illus. Nov. 20, 1931. 151.65 P96

Between July 23 and Sept. 12, 1931, 102 inspections were made of planes arriving at Miami, Fla., from South and Central America, Mexico, and the West Indies. Mosquitoes found on 21 planes totaled 29 (28 *Culex quinquefasciatus*, one *Aedes aegypti*). A 3-percent solution of yellowish eosin was used to stain, by means of an atomizer, adults of *Aedes argenteus* and *Culex quinquefasciatus*, and 100 were liberated in planes leaving San Juan, P. R. for Miami. At the end of the 1,250-mile trip, 22 of the specimens were recovered. Although only 11 mosquitoes showed a strongly positive reaction to a solvent (4 parts glycerine, 4 parts absolute alcohol, 1 part ether) used to show presence of the stain, it is reasonably certain that the other specimens were not picked up en route. The insects were collected from the planes by means of a suction apparatus.

HOLDEN, O. M. (400)
SOME DIFFICULTIES IN MEDICAL SUPERVISION AT AIR PORTS. Jour. State Med. [London] 39 (8): 457–466. August 1931. 449.9 R81

It is possible for disease-bearing insects to be carried in airplanes. Discusses the inspection and fumigation of aircraft, and the necessary quarantine measures. Hydrocyanic acid gas is the most useful fumigant. Airdromes located in yellow-fever zones must use special precautions against mosquitoes.

HOPPING, G. R. (401)
DUSTING BY AIRPLANE IN BRITISH COLUMBIA. Timberman 32 (3): 24, 48, 50, illus. January 1931. 99.81 T484

In the spring of 1930 operations were carried out in Stanley Park against *Lambdina fiscellaria* and *Rhyacionia frustrana*. Lack of a suitable plane made it necessary to equip with dusting hoppers 3 Boeing flying boats (425-hp. Wasp motors).

Describes hoppers and method of dust delivery. The coverage of calcium arsenate was 18 to 20 lb. per acre; larval mortality was 75 to 80 percent; and the cost for the entire area treated was $6.40 per acre. Dusting of the Seymour watershed on June 19 gave 80 to 85 percent mortality. To avoid destruction of its tachinid parasite, the hemlock looper should be treated in the 1st or 2d stages.

HOWARD, L. O. (402)
THE INSECT MENACE. 347 pp., illus. New York, Century Co., 1931. 423 H83In

Discusses the airplane as pest carrier and quotes letter from B. R. Coad, p. 149–152.

[JOHANSSON, F.] (403)
FLYGPLAN OCH INSEKTSHÄRJNINGAR. OM DEN TEKNISKA UTVECKLINGEN AV FLYGPLANET SOM MEDEL ATT BEKÄMPA SKADEINSEKTER [AIRPLANE AND INSECT RAVAGES. ON THE TECHNICAL DEVELOPMENT OF THE AIRPLANE AS A MEANS OF CONTROLLING INJURIOUS INSECTS]. Skogen 18 (1): 8–10, illus. Jan. 1, 1931. [In Swedish.] 99.8 Sk51

Signed: Sec.

Refers to dusting operations from 1925 to 1929. Equipment is described and illustrated, and tests with Esturmit discussed.

K., G. (404)
RAVNÎAĬTES' PO EGOROVU, ARTAMONOVU ZAGOROD'KO [COMPARE YOURSELF WITH EGOROV, ARTAMANOV, AND ZAGOROD'KO]. Na Zasch. Sotsialist. Urozhaĵa 1931, No. 10, pp. 31–32. October 1931. [In Russian.] Libr. Cong.

Describes outstanding records of these pilots in pest control. Portraits.

KEEN, F. P. (405)
THE CONTROL OF HEMLOCK LOOPERS BY AIRPLANE DUSTING. U. S. Forest Serv. Pacific Northwest Forest Expt. Sta. Forest Res. Notes No. 8, pp. 3–4. Dec. 11, 1931. 1.9 F7629F

Reprinted *in* Jour. Forestry 30 (4): 506–507. April 1932. 99.8 F768

This method was used for the first time in western United States from July 3 to 16, 1931, to control an outbreak of the hemlock looper (*Lambdina fiscellaria*) in Pacific County, Wash. It was financed jointly by the State of Washington and the Weyerhaeuser Timber Co. The plane, a 300-hp. Ryan monoplane with a load capacity of 1,000 lb., was supplied by the Northwest Air Service. Fifty-four tons of calcium arsenate dust were applied at the rate of 20 lb. per acre in 140-ft. strips. The plane flew about 40 ft. above the tree tops. Some difficulty was experienced in getting an even distribution of dust, and the rough topography of certain areas made it impossible for the plane to fly less than 140 ft. above the trees. The cost averaged $2.75 per acre. The main objective—to break up a concentrated infestation—was achieved.

KOMÁREK, J. (406)
MNIŠKOVA KALAMITA V LÉTECH 1917–1927. PT. XIX. LETECKÉ ROZPRAŠOVÁNÍ ARSENOVÝCH JEDŮ VE SLEZSKU V LETECH 1926 A 1927 [THE NUN MOTH OUTBREAKS IN THE YEARS 1926–1927. PT. XIX. CONTROL OF LYMANTRIA MONACHA IN SILESIA IN 1926 AND 1927]. Czechoslovakia Min. Zeměděl. Sborn. Výzkumn. Ust. Zeměděl. 78: [164]–185, illus. 1931. [In Czech. German summary, pp. 234–235.] 19.5 C99S

Detailed account of dusting operations with calcium arsenate. About 925 acres were treated in 1926 and 2,500 in 1927. Unexpected rains which washed off the dust caused failure of the 1927 work.

Konovalova, M. (407)
SAMOLET ZAVOEVAL PROCHNOE MESTO V BOR'BE S VREDITELIÂMI KHLOPKA [AIRPLANE HAS MADE A FIRM PLACE FOR ITSELF IN THE CONTROL OF COTTON PESTS]. Na Zashch. Sotsialist. Urozhaâ 1931, No. 11, p. 9. November 1931. [In Russian.] Libr. Cong.

Dusting by airplane in Tadzhikistan has proved the supremacy of the aviochemical method in large-scale socialist economy.

Korotkikh, G. I. (408)
NUZHEN NOVYĬ AERO-OPYLIVATEL' [THE NEED FOR A NEW TYPE OF DUSTER]. Na Zashch. Sotsialist. Urozhaâ 1931, No. 9, p. 30. September 1931. [In Russian.] Libr. Cong.

——— (409)
PLAN RABOTY NAUCHNO-ISSLEDOVATEL'SKOGO INSTITUTA SEL'SKOKHOZÂĬSTVENNOĬ AVIATSII OBV (NIISKHA) NA 1932 GOD [WORK PLAN OF THE SCIENTIFIC RESEARCH INSTITUTE FOR AGRICULTURAL AVIATION FOR 1932]. Vsesoûzn. Aviokonf. po Bor'be s Vred. v Sel'sk. i Lesn. Khoz., 2, Moskva, 1931, Tezisy Dok., pp. 24–30. [In Russian.] Libr. Cong.

In the field of pest control, the Institute will devote itself to research on efficiency in organization and operation, mechanization of certain work processes, increase of production, time schedules, and cost studies.

——— (410)
SAMOLET NA ZASHCHITU UROZHAÂ [AIRPLANE FOR CROP PROTECTION]. Aviatsiâ i Khimiâ 6 (2): 4–5. February 1931. [In Russian.] Libr. Cong.

Refers to the decision of the 1st All-Union Aviochemical Conference to make maximum use of the airplane in the control of agricultural and forest pests in the Soviet Union.

Korotkov, V. M. (411)
ITOGI OPYTNYKH RABOT VIZR I NIISKHA PO PRIMENENIÛ SAMOLETA V SEL'SKOM I LESNOM KHOZÂĬSTVE V 1931 G. [RESULTS OF EXPERIMENTAL WORK OF THE ALL-UNION PLANT PROTECTION INSTITUTE AND THE SCIENTIFIC RESEARCH INSTITUTE FOR AGRICULTURAL AVIATION ON THE USE OF THE AIRPLANE IN AGRICULTURE AND FORESTRY IN 1931]. Vsesoûzn. Aviokonf. po Bor'be s Vred. v Sel'sk. i Lesn. Khoz., 2, Moskva, 1931, Tezisy Dok., pp. 16–23. [In Russian.] Libr. Cong.

The rapid development of the aviochemical method in pest control caused OBV to establish, in the spring of 1931, an Aviochemical Section in the All-Union Institute of Plant Protection. This section was charged with carrying on experimental work, such as tests against different pests on various crops, insecticidal studies, distribution and adherence of the dusts, etc.

——— (412)
OPYTNYE AVIOKHIMICHESKIE RABOTY I PROGRAMMNYE USTANOVKI IKH NA 1931 GOD [PROGRAMS FOR EXPERIMENTAL AVIOCHEMICAL WORK IN 1931] Zashch. Rast. 8 (1): 21–24. May 1931. [In Russian.] 421 D36

——— (413)
OSNOVNYE METODICHESKIE POLOZHENIÂ V POSTANOVKE AVIOKHIMOPYTA [THE TECHNICAL PRINCIPLES OF AVIOCHEMICAL FIELD EXPERIMENTATION]. Zashch. Rast. 8 (2): 149–153. July 1931. [In Russian.] 421 D36

Information on technical points in airplane dusting. For experimental records the dust should be released on six parallel lines which are allowed to overlap. Width of the toxic strip was determined by means of test cages placed at intervals in the treated area. Dust distribution was checked by placing pans of distilled water 16 ft. apart across the line of flight; the adhesiveness was checked by removing all the leaves from the plants in a certain area and comparing the quantity of poison on them with that collected from a flat surface of equal size. Damage to plants was determined by samples taken 5 to 10 days after dusting.

——— (414)
PROFIL' SPETSIALISTA S.-KH. AVIATSII I PUTI EGO PODGOTOVKI [QUALIFICATIONS OF A SPECIALIST IN AGRICULTURAL AVIATION AND METHODS OF HIS TRAINING]. Vsesoiuzn. Aviokonf. po Bor'be s Vred. v Sel'sk. i Lesn. Khoz., 2, Moskva, 1931, Tezisy Dok., pp. 33–35. [In Russian.] Libr. Cong.

Discusses the lack of a trained technical force and the urgent need for an educational program. Lists specific requirements for each type of worker.

KÜFFNER. (415)
FORSTSCHÄDLINGE IN BAYERN. Deut. Forst-Ztg. 27 (46): 656–657. July 3, 1931. 99.8 D48

Refers to airplane dusting in Bayern and lists the Government regulations by which the public may avoid injurious results.

LEDNEV, M. (416)
AVIOMETOD V BOR'BE S VREDITELIAMI VINOGRADA [AVIO-METHOD IN CONTROL OF GRAPE PESTS]. Na Zashch. Sotsialist. Urozhaia 1931, No. 12, p. 32. December 1931. [In Russian.] Libr. Cong.

Describes work of first expedition in Azerbaidzhan.

LOCKWOOD, S. (417)
THE CONTROL OF INSECTS AND MITES BY AIRPLANE. Calif. Cult. 76 (19): 501, 512–513. May 9, 1931. 6 C12

In 1930 about 140,000 acres of growing crops had been dusted by airplane in California. Reviews the history of pest control by airplane in the United States, Canada, and Europe.

MACKIE, D. B. (418)
ENTOMOLOGICAL FUNCTIONS. Calif. Dept. Agr. Monthly Bul. 19 (12): 831–848. December 1930, published 1931. 2 C12M

A brief discussion of airplane control of insects is included in the 11th annual report of the California Department of Agriculture. In 1930 about 140,000 acres of growing crops were treated.

——— and JONES, M. L. (419)
SOME BIOLOGICAL ASPECTS OF THE 1931 PEACH SITUATION. Calif. Dept. Agr. Bul. 20 (10/11): 661–665, illus. October/November 1931. 2 C12M

Airplane dusting, resorted to as an emergency measure against *Anarsia lineatella*, proved inadequate and was abandoned.

MAKUNIN, F. (420)
BOL'SHE VNIMANIIA PODGOTOVKE AVIO-RABOT V 1932 G. [MORE ATTENTION TO THE PREPARATION FOR AIRPLANE WORK IN 1932]. Na Zashch. Sotsialist. Urozhaia 1931, No. 11, pp. 8–9. November 1931. [In Russian.] Libr. Cong.

Use of the airplane is hampered by insufficient data on dosages and the toxic effect of the insecticides, but success in the 1932 work can still be insured by careful organization.

MASSEY, A. (421)
PUBLIC HEALTH PROBLEMS ATTENDANT ON AIR TRAVEL. Brit. Med. Jour. 1931, 1 (3684): 296–297. Aug. 15, 1931. 448.8 B77

Includes discussion of typhus fever, yellow fever, *Aedes aegypti*, etc. Tables show infected countries trading with Great Britain, incubation periods of diseases, and time periods of air journeys.

MEYER, R. (422)
ERFAHRUNGEN BEI DER KIEFERNSPANNERBEKÄMPFUNG. Deut. Gesell. f. Angew. Ent. Verhandl. (1930) 8: 40–44. 1931. 420 D48V

Account of airplane dusting against *Bupalus piniarius* over two severely infested pine forests in northern Germany. A proprietary contact dust was used at the rate of about 55 lb. to the acre. The larvae began to die within 2 hr., and the number killed rapidly increased on the 2 following days.

MIKHAĬLOV-SENKEVICH, ÎA. M. (423)
OPYT PRIMENENIÎA AVIATSII V BOR'BE S DUBOVOĬ LISTOVERTKOĬ V CHUVASHSKOĬ ASS RESPUBLIKE V 1928 GODU [AIRPLANE DUSTING IN CONTROLLING THE OAK LEAF ROLLER, TORTRIX VIRIDANA, IN THE CHUVASH REPUBLIC, 1928]. Inst. Zashch. Rast. Trud. po Zashch. Rast. 3 (1) [i. e. ser. 3, No. 2]: 61–77. 1931. [In Russian. English summary, p. 77.] 423.92 L54C

One hundred and forty-four flights were made between May 27 and June 24, 1927, over an area of 3,800 acres. The plane used was a Konek Gorbunok, and work was done between 2:30 and 7 or 8 a.m. After 8 o'clock, the effect of air currents made trips inadvisable. Ten tons of arsenicals (calcium arsenate, calcium arsenite, lead arsenate, and lead arsenite) were distributed. The highest average mortality, 80 percent, was obtained with lead arsenite applied at 7 to 8 lb. per acre. Lead arsenate proved much less effective. The dusts adhered better when dew was on the plants. The author concludes that airplane dusting is feasible and reasonably satisfactory.

NABOKOV, V. A. (424)
ISPOL'ZOVAT' SAMOLET DLIÎA BOR'BY S MALIÂRIEĬ [USE OF AIRPLANE IN CONTROL OF MALARIA]. Aviatsiîa i Khimiîa 6 (7): 2–4, illus. July 1931. [In Russian.] Libr. Cong.

Refers to the work done in the Soviet Union in malaria control, and points out advantages of the airplane in reaching inaccessible places.

——— (425)
NOVOE DOSTIZHENIE SOVETSKOĬ AVIATSII [NEW ACHIEVEMENTS OF SOVIET AVIATION]. Na Zashch. Sotsialist. Urozhaîa 1931, No. 3, pp. 11–14, illus. March 1931. [In Russian.] Libr. Cong.

Advantages of the airplane in control of crop pests and mosquitoes. Refers to 1930 work of Moscow Tropical Institute and the OBV in Azerbaidzhan.

——— (426)
PRIMENENIE SAMOLETOV V BOR'BE S LICHINKAMI KOMAROV [THE USE OF AIRPLANES IN THE CONTROL OF MOSQUITO LARVAE]. Trop. Med. Vet. 9 (7/8): 395–397. 1931. [In Russian. French summary.] Army Med. Libr.

In the Moscow region in 1929 paris green and talc in ratios of 1:5 (where water basins were not too deep) and 1:20 resulted in larval kills of 100 percent. Planes flying at a height of 33 to 50 ft. gave a dust cloud of about 400 ft. in width. The minimum dose toxic to larvae is 0.0002 mg.

——— BOGDANOVA, A. A., and UTKIN, B. G. (427)
PRIMENENIE SAMOLETOV V BOR'BE S LICHINKAMI MALIÂRIĬNYKH KOMAROV [USE OF AIRPLANES IN THE CONTROL OF THE LARVAE OF MALARIA MOSQUITOES]. Trop. Med. Vet. 9 (6): [279]–288. 1931. [In Russian. French summary.] Army Med. Libr.

Detailed account of tests made in 1929 near Moscow against the larvae of *Anopheles maculipennis*. A more rapid kill was noticed among 3d or 4th instar larvae than among 1st or 2d instars because the mouth brushes of the latter cannot catch the paris green particles easily. Laboratory tests showed the minimum lethal dose to be 0.0002 mg. Paris green used at the rate of 1 lb. per acre caused no damage to fish, birds, or mammals. It is recommended that paris green mixed with a carrier in a ratio not exceeding 1:1 be used for airplane dusting.

POETEREN, N. VAN. (428)
BESTUIVING VAN DENNENBOSSCHEN MET BEHULP VAN MOTORVERSTUIVERS [THE DUSTING OF PINE WOODS BY MEANS OF POWER DUSTERS]. Tijdschr. over Plantenziekten 37 (10): 200–200c, illus. October 1931. [In Dutch.] 464.8 T44

Results demonstrated the advantages of this method over airplane dusting for small woodlands.

POTAPOV, A. N. (429)
AËROPYL KONSTRUKTSII 1931 GODA NADO SMENIT' [DUSTING APPARATUS OF 1931 MODEL MUST BE CHANGED]. Na Zashch. Sotsialist. Urozhaîa 1931, No. 12, pp. 34–35. December 1931. [In Russian.] Libr. Cong.

Describes the defects in the dusting apparatus furnished in 1931 and states that the equipment of 1930 was more efficient. Satisfactory modifications should be worked out before the next dusting season.

——— (430)

AVIOKHIMICHESKIĬ METOD V BOR'BE S AZIATSKOĬ SARANCHEĬ [THE AVIOCHEMICAL METHOD IN THE CONTROL OF ASIATIC LOCUST]. Na Zashch. Sotsialist. Urozhaia 1931, No. 9, pp. 25–29. September 1931. [In Russian.] Libr. Cong.

Use of the airplane in locust control in Dagestan dates back to 1926, but there are still many infested regions. Cites difficulties of the 1931 campaign, during which 18,982 ha. were dusted in 413 flights with sodium arsenite or calcium arsenite, with an average dose of 2.9 kg. Recommendations for 1932 include improvements in the duster, use of radios for signaling, use of meteorological apparatus, and an insurance plan for ground workers exposed to insecticides.

——— (431)

BOR'BA S AZIATSKOĬ SARANCHEĬ V DAGESTANSKOĬ SSR AVIAKHIMMETODOM V 1930 GODU [CONTROL OF ASIATIC LOCUST BY AIRPLANE DUSTING IN DAGESTAN IN 1930]. Inst. Bor'by s Vred. i Bolezn. Sel'sk. i Lesn. Khoz. Izv. 1, pp. [9]–24, illus. Leningrad, 1931. [In Russian.] 423.92 L543

Reviews operations against *Locusta migratoria;* points out errors made and lessons to be learned from them for future organization of airplane control work. Three aviation details with 6 planes dusted about 33,429 ha. with 84,829 kg. of insecticides. Approximately 2.53 kg. of dust were applied per acre. In an actual flying time of 177⅓ hr. during 56 working days, the planes made 533 flights. Both calcium arsenite and paris green were tested alone, but a mixture of the two proved more effective.

——— (432)

RADIO—NA SLUZHBU S.-KH. AVIATSII [RADIO—IN THE SERVICE OF AGRICULTURAL AVIATION]. Na Zashch. Sotsialist. Urozhaia 1931, No. 9, pp. 30–31. September 1931. [In Russian.] Libr. Cong.

PUKHOV, B. [A.] (433)

NA BOR'BU S SARANCHEĬ [LOCUST CONTROL]. Na Zashch. Sotsialist. Urozhaia 1931, No. 4, pp. 18–20, illus. April 1931. [In Russian.] Libr. Cong.

Since 1926 airplane dusting has been successfully employed over large areas. In 1930, 30,000 ha. were dusted in Dagestan and 10,000 ha. in North Caucasus. In 1931, 230,000 ha. were dusted. Lists advantages of airplane dusting over other methods. Ground work can be used as a supplementary measure.

RAFES, P. M. (434)

AVIOBOR'BA S VREDITELIAMI I BOLEZNIAMI VINOGRADNIKA [AVIATION CONTROL OF PESTS AND DISEASES OF THE VINEYARD]. Na Zashch. Sotsialist. Urozhaia 1931, No. 10, pp. 36–37. October 1931. [In Russian.] Libr. Cong.

Describes operations in the North Caucasus. Work began on the state farm Dzhemetė where over 1,000 ha. had been dusted with sulfur or calcium arsenate.

——— (435)

O MEROPRIIATIIAKH PO ULUCHSHENIIU ORGANIZATSII I POSTANOVKI AVIAKHIMRABOT [CONCERNING METHODS OF IMPROVEMENT IN THE ORGANIZATION AND SET-UP OF AVIOCHEMICAL WORK]. Vsesoiuzn. Aviokonf. po Bor'be s Vred. v Sel'sk. i Lesn. Khoz., 2, Moskva, 1931, Tezisy Dok., pp. 31–32. [In Russian.] Libr. Cong.

Discusses cooperative duties and responsiblities of the airplane bases and MIS (mechanized extermination stations), payment of workers based on individual accomplishment (piece work), and stimulation of socialist competition among the crews.

——— (436)

SAMOLET NA ZASHCHITE UROZHAIA SPETS. I TEKHNICH. KUL'TUR [AIRPLANE FOR THE PROTECTION OF SPECIAL AND TECHNICAL CROPS]. Sotsialist. Pereustroĭstvo 1931, No. 5/6, pp. 112–114. [In Russian.] 281.8 So7

In 1931 the airplane was used for the first time in the world to dust vineyards. On the Anapskii state farm Dzhemetė and on the adjacent collective

farms,1,224 ha. were treated with sulfur, 1,599 ha. with calcium arsenate, and 10 ha. with blue vitriol to test the effect upon mildew. Also 1,484 ha. of cotton were dusted with calcium arsenate. The airplane has the advantage of saving labor in the cultivation of special crops in the North Caucasus.

——— (437)

TAKTIKA I STRATEGIÎA V BOR'BE S SARANCHEĬ [TACTICS AND STRATEGY OF LOCUST CONTROL]. Zashch. Rast. 8 (2): 161–166. July 1931. [In Russian.] 421 D36

The first stage of an antilocust campaign, during which there are many large bands of hoppers not widely separated, is most suitable for the use of airplanes since the poison can be profitably distributed over large continuous areas.

*——— (438)

TEKHNICHESKIE PRIEMY I ORGANIZAT͡SIONNYE FORMY BOR'BY S SARANCHEĬ [TECHNICAL METHODS AND ORGANIZATION OF THE CONTROL OF THE MIGRATORY OR ASIATIC LOCUST (LOCUSTA MIGRATORIA)]. Sev.-Kavkaz. Kraev. Otd. Gosud. Vsesoîuzn. Ob"ed. Bor'be Vred. Selsk. Lesn. Khoz. [Bul.] Ser. A, No. 4, 73 pp., illus. Rostov-on-Don, 1931. [In Russian.]

Gives detailed instructions for usual control measures and for airplane dusting. One airplane can dust more than 12,000 acres in a single campaign. From 1½ to 4 lb. of calcium arsenate or 2 to 3½ lb. of sodium arsenite will cover about one acre. Airplane dusting should only be used over large areas.—Abstract *in* Rev. Appl. Ent. A 20: 196. 1932.

RUEDIGER, E. (439)

SCHÄDLINGSBEKÄMPFUNG MIT ARSEN. Ent. Rundschau 48 (1): 11–12. Jan. 1, 1931; (2): 13–14. Jan. 15, 1931. 421 In72

Danger to bees and to wildlife makes airplane dusting with arsenicals undesirable.

RUKAVISHNIKOV, B. [I.] (440)

OPYTNYE AVIOKHIMICHESKIE RABOTY V 1931 G. [EXPERIMENTAL AVIOCHEMICAL WORK IN 1931]. Na Zashch. Sot͡sialist. Urozhaî 1931, No. 8, pp. 18–19. August 1931. [In Russian.] Libr. Cong.

In spite of unfavorable conditions, the expedition against the Morroccan locust, *Dociostaurus maroccanus*, carried out the following investigations: (1) correct dosages of poison; (2) effect of dry bait scattered by airplane; (3) use of calcium arsenate against the apple moth, *Hyponomeuta padella*, in Azerbaidzhan; (4) testing of insecticides and development of new dusts. The correct dosage of sodium arsenate for locusts was found to be from 3 to 3.5 kg. per hectare. The poison acts as both a stomach and a contact insecticide.

SERGEEV, A. (441)

AVIAT͡SIÎA OBV PEREVYPOLNÎAET PÎATILETKU [AVIATION IN PEST CONTROL EXCEEDS ITS FIVE-YEAR PLAN]. Na Zashch. Sot͡sialist. Urozhaî 1931, No. 8, pp. 14–15. August 1931. [In Russian.] Libr. Cong.

Gives comparative data on areas dusted from 1928 to 1931; discusses enlarged plans for 1932/33 and how they may be efficiently carried out.

SERGEEV, A. I. (442)

ITOGI RABOT AVIAT͡SII OBV V SEL'SKOM I LESNOM KHOZÎAĬSTVE V 1931 G. I PLAN RABOT NA 1932 GOD [RESULTS OF OBV AVIATION WORK IN AGRICULTURE AND FORESTRY FOR 1931, AND PLAN FOR 1932]. Vsesoîuzn. Aviokonf. po Bor'be s Vred. v Sel'sk. i Lesn. Khoz., 2, Moskva, 1931, Tezisy Dok., pp. 7–15. [In Russian.] Libr. Cong.

Describes difficulties OBV had to contend with in its application of the aviochemical method in 1931. However, operations planned for 5 yr. have been completed in 3 yr. The 1932 plan is more extensive and will require many improvements in management and organization. Includes eight comparative tables of various phases of the work.

———and Mladkovskiĭ [Mlodkovskiĭ, B. L.] (443)
SOSTOIANIE TEKHNICHESKOĬ EKSPLOATATSII AVIAPARKA OBV I MEROPRIIATIIA PO EE ULUCHSHENIIU [THE STATUS OF TECHNICAL UTILIZATION OF OBV'S AVIATION PARK AND MEASURES FOR ITS IMPROVEMENT]. Vsesoiuzn. Aviokonf. po Bor'be s Vred. v Sel'sk. i Lesn. Khoz., 2, Moskva, 1931, Tezisy Dok., pp. 36–39. [In Russian.] Libr. Cong.

Points out factors responsible for the inefficient use of airplanes in 1931, and outlines methods for perfecting the care and operation of planes in 1932.

Shmatkov, V. (444)
DOSTIGNUTA STOPROTSENTNAIA SMERTNOST' MALIARIĬNOGO KOMARA [A HUNDRED PERCENT MORTALITY OF THE MALARIA MOSQUITO WAS ACHIEVED]. Na Zashch. Sotsialist. Urozhaia 1931, No. 10, p. 35. October 1931. [In Russian.] Libr. Cong.

In the Central Volga region the aviation crew concentrated on malaria control only. Working conditions were most difficult since there were no maps or plans of the locality and because the swamps prevented use of guiding signals. Planes carried an observer to watch the terrain and to agitate the dust in the hopper to assure even mixing of paris green and tripoli dust.

——— (445)
SAMOLET POBEZHDAET [THE AIRPLANE WINS]. Na Zashch. Sotsialist. Urozhaia 1931, No. 11, p. 10. November 1931. [In Russian.] Libr. Cong.

Refers to mosquito control in the Samara region. The first attempt was unsuccessful, only 35 percent mortality resulting. In the second test a plane carrying the pilot alone gave 50 percent mortality. A plane carrying an "observer in addition" raised the percentage to 85. On a third attempt larval mortality was complete.

——— (446)
USILIT' SNABZHENIE AVIO-OTRIADOV [ON IMPROVING THE SUPPLIES FOR AVIATION CREWS]. Na Zashch. Sotsialist. Urozhaia 1931, No. 10, pp. 17–18. October 1931. [In Russian.] Libr. Cong.

Describes the difficult working conditions of the Central Volga aviation crew on malaria control at the Samara airplane station.

Sukhanov. (447)
SAMOLET—POD ZASHCHITU [THE AIRPLANE—ON THE DEFENSIVE]. Na Zashch. Sotsialist. Urozhaia 1931, No. 10, p. 34. October 1931. [In Russian.] Libr. Cong.

Describes the local prejudices that had to be overcome before dusting 2,121 ha. of orchards in the Kubinskiĭ region. A commission was appointed to make a study and report to the community.

Sytin, V. (448)
BOĬ SAMOLETA S SARANCHEĬ [THE BATTLE OF THE AIRPLANE WITH LOCUSTS]. Na Zashch. Sotsialist. Urozhaia 1931, No. 4, pp. 30–33, illus. April 1931. [In Russian.] Libr. Cong.

In spite of unfavorable rainy weather, the author was agreeably surprised at the mortality among locusts in treated areas.

——— (449)
NA VYSSHUIU STUPEN' SOTSSOREVNOVANIE V AVIOOTRIADAKH [THE HIGHEST DEGREE OF SOCIALIST COMPETITION IN THE AVIATION CREWS]. Na Zashch. Sotsialist. Urozhaia 1931, No. 5, pp. 36–37. May 1931. [In Russian.] Libr. Cong.

To carry out the plan for dusting a half million hectares competition must be stimulated among the crews. Lists important points to observe in order to achieve increased efficiency.

Thomas, R. (450)
EXTERMINATION OF LOCUSTS BY AEROPLANE. Empire Cotton Growing Rev. 8 (2): 121–123. April 1931. 72.8 Em7

Reviews work done in the Philippine Islands in 1923 by the U. S. Army Air Service. Dusting with calcium arsenate was found effective and econom-

ical. The points for dusting were marked out about sundown after the locusts had settled, and the dusting was done immediately. A strip in advance of the line of movement of the locusts was also dusted to catch any that might survive and begin to feed in the morning. Both breeding places and swarms can be located from the air. Pilots should be acquainted with the life history of the locust.

*TSIOPKALO, V. L. (451)
AVIAKHIMICHESKIĬ METOD V BOR'BE S VREDITELÎAMI LESA [THE AVIOCHEMICAL METHOD IN THE CONTROL OF FOREST PESTS]. Ser. Nauch. Izd. Ukr. Zonal'n. Nauch. Issled. Inst. Lesn. Khoz. i Lesn. Promysh., Tekh. Izd., No. 21, 50 pp. Khar'kov, 1931. [In Russian.]

The Korotkikh and Rafes bibliography (p. iv) cites this on p. 56.

Reviews history of airplane dusting against forest pests in various countries, and cites insects which can be controlled economically by this method. Describes physical properties of various insecticides and their effects on insects, domestic animals, and vegetation; discusses technical problems involved in airplane work; states that cost compares favorably with other methods.—Abstract *in* Rev. Appl. Ent., A 21: 9. 1933.

TWINN, C. R. (452)
ANIMAL AND PLANT ENEMIES OF MOSQUITOES. N. J. Extermin. Assoc. Proc. (1931) 18: 35–39. 420 N46

This article forms the concluding part of a paper by Arthur Gibson.

Reports on experiments to determine the feasibility of applying by airplane a dust composed of a kerosene-pyrethrum extract and a filler (kaolin, hydrated lime, or powdered gypsum).

VOELKEL, H., and others. (453)
BERICHTE UND VERSUCHE ÜBER ENTWICKLUNG UND BAU EINES STREUAPPARATES FÜR DAS REICHSEIGENE FLUGZEUG TYPE CASPAR C32. Biol. Reichsanst. f. Land- u. Forstw. Mitt., No. 42, 20 pp., illus. Berlin, 1931. 410.9 G31M

Contains sections by Hoffmann, Kienitz, and H. E. Dechert.

Laboratory work to develop a suitable dust distributor and wind shield to protect dust at point of delivery, together with a report on practical tests with the assembled equipment.

VORONTSOVSKIĬ, P. A. (454)
ÉKOLOGICHESKIÎA USLOVIÎA OBITANIÎA SARANCHI LOCUSTA MIGRATORIA V NIZHNEĬ DEL'TE AMU-DAR'I (ECOLOGICAL CONDITIONS IN THE HABITAT OF LOCUSTA MIGRATORIA IN THE LOWER DELTA OF AMU-DARYA). Turtkul'. Kompleks. Nauch.-Issled. Inst. Sekts. Biol., Razrîad Ent. Trud. No. 1, 34 pp. Turtkul'? 1931. [In Russian.] Univ. Ill. Libr.

In 1930 the author and IÂ. A. Shumilin toured the region to investigate the locust foci and to study the possibilities for airplane dusting. *Phragmites communis* was found to be the favorite food plant, and also to offer a suitable environment for breeding. The effects of temperature and soil moisture on hatching were also studied. The investigation showed that the inaccessibility and shifting nature of the breeding places made airplane dusting the only possible control method. The island of Mulnak would be a satisfactory base for the aviation detail.

VSESOIUZNAÎA AVIOKONFERENTSIÎA PO BOR'BE S VREDITELÎAMI V SEL'SKOM I LESNOM KHOZÎAĬSTVE. 2D, MOSCOW, 1931. (455)
TEZISY DOKLADOV. 39 pp. [Moskva], Sel'kholkhozgiz, 1931. [In Russian.] Libr. Cong.

All-Union Airplane Conference on Pest Control in Agriculture and Forestry. For contents *see* items 409, 411, 414, 435, 442, 443, 458.

ZAKHAROV, P. (456)
ITOGI I PERSPEKTIVY BOR'BY S LESNYMI VREDITELÎAMI AVIATSIONNOKHIMICHESKIM METODOM [RESULTS AND PROSPECTS OF FOREST PEST CONTROL WITH THE AVIOCHEMICAL METHOD]. Na Zashch. Sotsialist. Urozhaîa 1931, No. 10, p. 37. October 1931. [In Russian.] Libr. Cong.

——— (457)

IZ OPYTA AVIAKHIMICHESKIKH RABOT V LESAKH T͡SCHO I USSR PO BOR'BE S SOSNOVOĬ P͡IADENNIT͡SEĬ V 1930 GODU [AIRPLANE DUSTING IN THE CONTROL OF BUPALUS PINIARIUS IN THE FORESTS OF CENTRAL RUSSIA AND THE UKRAINE IN 1930]. Inst. Bor'by s Vred. i Bolezn. Sel'sk. i Lesn. Khoz. Izv. 1: [121]–126, illus. Leningrad, 1931. [In Russian.] 423.92 L543

Nearly 2,000 acres were dusted with calcium arsenite in the last half of September 1931. The mortality rate was estimated by cutting all the branches from selected trees and counting the living and dead larvae and also those on the ground beneath, or by comparing the quantity of excreta before and after dusting. An average of 60 to 70 percent were killed, but a maximum of 90 to 100 was reached by the use of 9 to 10 lb. of poison to the acre. Dosage should be varied according to height and density of the vegetation.

ZELENUKHIN, I. (458)

ZADACHI AVIAT͡SII V SEL'SKOM I LESNOM KHOZI͡AĬSTVE I PERSPEKTIVY EE PRIMENENII͡A VO 2-I͡U P͡IATILETKU [PROBLEMS OF AVIATION IN AGRICULTURAL AND FOREST ECONOMY AND THE OUTLOOK FOR ITS UTILIZATION DURING THE 2D 5-YEAR PLAN]. Vsesoi͡uzn. Aviokonf. po Bor'be s Vred. v Sel'sk. i Lesn. Khoz., 2, Moskva, 1931, Tezisy Dok., pp. 3–6. [In Russian.] Libr. Cong.

Under the socialistic agricultural reconstruction of the Soviet Union, the airplane will take its place with the tractor, combine, and automobile in large-scale production. At the present time, its use has been limited to crop-pest control, malaria control, and sowing. In the first year of the 5-year plan airplane treatment was to be applied to 3,100,000 ha. for crop-pest control, and 2,000,000 ha. for malaria control. The figures for the final year are given as 15,200,000 and 15,000,000 respectively. The report also discusses construction of planes, training of personnel, etc.

1932

ANONYMOUS. (459)

OILING MOSQUITO-BREEDING MARSHES BY AIRPLANE. Pub. Works 63 (9): 46, 48. September 1932. Pub. Roads Libr.

Account of work done, under direction of H. F. Gray, in Alameda County, Calif., Mosquito Abatement District, using a light grade of kerosene oil distributed by means of brushes rotating at 5,000 revolutions per min. By this method, it was possible to apply as little as 2 or 3 gal. per acre. Oils of 27- to 30-degree gravity are advised. One hundred percent mortality was reached with 302 gal. applied to 19 acres. The airplane method is recommended for large areas but would not be economical for small, scattered breeding places.

——— (460)

TRANSMISSION OF MOSQUITOES BY AIRPLANES. Amer. Jour. Pub. Health 22 (4): 397–398. April 1932. 449.9 Am3J

ALEKSANDROV, A. (461)

UDARNOE AVIOZVENO NO. 316 [SHOCK AVIATION CREW NO. 316]. Na Zashch. Sot͡sialist. Urozhai͡a 1932, No. 1, p. 14. January 1932. [In Russian.] Libr. Cong.

Regardless of difficulties in transportation the aviation crew accomplished its dusting assignment of 2,230 ha. of cotton ahead of planned schedule.

——— (462)

VOSPOMINANII͡A O SARANCHEVOM FRONTE [RECOLLECTIONS ABOUT THE LOCUST FRONT]. Na Zashch. Sot͡sialist. Urozhai͡a 1932, No. 1, pp. 12–13, illus. January 1932. [In Russian.] Libr. Cong.

Tells how the airplane saved the crops from *Dociostaurus maroccanus* in the Meganskai͡a steppe.

AVVAKUMOV, N. (463)

BOR'BA S LUGOVYM MOTYL'KOM V T͡SCHO [CONTROL OF THE MEADOW MOTH IN T͡SCHO (CENTRAL BLACK-SOIL REGION)]. Vsesoi͡uzn. Aviakhim. Konf., 1, Moskva, 1930, Mater., pp. 110–120. 1932. [In Russian.] 422.5 V963

Calcium arsenate, either pure or mixed with equal parts of lime, was applied to sugar beets to check outbreak of meadow moth, *Loxostege sticticalis*,

in the Soviet Union. Planes flew at a height of 16 to 20 ft. over about 1,000 acres, using 2.7 to 3.6 lb. per acre. At higher altitudes much dust was carried away by the wind, and an increase in dosage did not increase larval mortality rate. Calcium arsenate was found unsuited to dusting beets as it resulted in severe burning of foliage and even injury to roots, causing decrease in weight and sugar content of crop.

BALANDIN, V. (464)
DOROGU SAMOLETAM [MAKE WAY FOR AIRPLANES]. Na Zashch. Sot͡sialist. Urozhai͡a 1932, No. 1, p. 7. January 1932. [In Russian.] Libr. Cong.

In 1931 the aviochemical method was first used in the Lower Volga region against pests of the mustard plant and in mosquito control. Dusting 16,000 ha. of mosquito-breeding places resulted in a 95 percent larval mortality.

——— (465)
PERSPEKTIVY RAZVITIÏA S.-KH. AVIAT͡SII V NIZHNEM POVOLZH'I [THE PROSPECTS FOR DEVELOPMENT OF AGRICULTURAL AVIATION IN THE LOWER VOLGA REGION]. Na Zashch. Sot͡sialist. Urozhai͡a 1932, No. 3, pp. 20–21. February 1932. [In Russian.] Libr. Cong.

With the development of state and collective farms the use of aviation has become an outstanding factor in agriculture. Reviews 1931 work against mustard pests and malarial mosquitoes. Outlines 1932 program to be carried out by the agricultural aviation base at Saratov.

BALCH, R. E., and SIMPSON, L. J. (466)
A EUROPEAN SAWFLY (DIPRION POLYTOMUM HARTIG) [I. E. DIPRION HERCYNIAE.] ATTACKING SPRUCE IN THE GASPÉ PENINSULA, QUE. Canad. Ent. 64 (7): 162–163. July 1932. 421 C16

During the 1931 outbreak an airplane survey to determine area affected showed over 2,000 acres to be infested.

BEĬ-BIENKO, G. I͡A. (467)
OSNOVNYE REZUL'TATY ISSLEDOVANIĬ I PROBLEMA SISTEM MEROPRIÏTIĬ PO SARANCHEVYM SSSR [BASIC RESULTS OF INVESTIGATIONS AND THE PROBLEM OF CONTROL METHODS AGAINST LOCUSTS IN U. S. S. R.]. Vsesoi͡uzn. S"ezd po Zashch. Rast. 7, Leningrad, 1932, Bul. 7: 4–8. [In Russian.] 423.92 V96

Discusses the possibility of reducing cost of operations in airplane dusting by decreasing dosages of insecticides. In 1932, this practice was successfully used in Central Asia. Also mentions the plan for locust control by airplane in Siberia, which showed the possibility of dusting cereal crops with calcium arsenite.

——— (468)
ZNACHENIE I PERSPEKTIVY AVIAT͡SII V DELE BOR'BY S SARANCHEVYMI [THE IMPORTANCE AND OUTLOOK OF AVIATION IN THE CONTROL OF INJURIOUS LOCUSTS]. Zashch. Rast. 1932, No. 1, pp. 43–50. 1932. [In Russian. English summary, pp. 49–50.] 421 D36

The speed of airplane distribution of insecticides makes it the only method which permits destruction of the main masses of locusts during the 1st to 3d instars, before there has been much spread to new areas. Dusting with sodium arsenite at the rate of 1.8 lb. per acre gave 100 percent mortality. Good results were obtained by airplane broadcasting of poison bait (6.7 to 10 percent sodium arsenite) at the rate of 13.35 lb. per acre.

BELI͡AEV, V. (469)
PODNI͡AT' KACHESTVO PODGOTOVKI KADROV PO BOR'BE S VREDITELI͡AMI [ON RAISING QUALIFICATIONS FOR THE TRAINING OF WORKERS FOR PEST CONTROL]. Na Zashch. Sot͡sialist. Urozhai͡a 1932, No. 15, pp. 26–28. August 1932. [In Russian.] Libr. Cong.

Discusses revision by the Government of requirements for the training of technical specialists, particularly for pest control.

BROWN, A. C. (470)
AIRPLANES AND PLANT PESTS. Citrus Indus. 13 (2): 11. February 1932. 80 C49

Voices the fear of Florida growers and quarantine officials that the great international airport at Miami may be a factor in the importation of foreign plant pests.

BUDYLIN, V. G. (471)
BOR'BA S MALÎARIEĬ AVIAKHIMMETODOM V KHLOPKOVOM SOVKHOZE KARACHALA V 1931 GODU [CONTROL OF MALARIA BY THE AVIOCHEMICAL METHOD IN THE COTTON STATE FARM KARA-CHALA IN 1931]. Vsesoîûzn. Konf. po Aviakhim. Metodu Bor'by s Malîarieĭ, 1, Moskva, 1931, Mater., pp. 16–23. 1932. [In Russian.] 448.8 M469

Also *in* Med. Parazitol. i Parazitar. Bolezni 1 (2): 80–87. 1932. More than 15 sq. miles of water surface were dusted with paris green for the control of *Anopheles maculipennis* in southeastern Azerbaidzhan. All larvae were killed in 24 hr. with a dosage of 3½ oz. per acre. The operation was successful in reducing the number of larvae, and the malaria rate fell about 53 percent.

BURCHE, E. (472)
DOGOVORNAÎA KAMPANÎA AVIABAZ PO ISTREBITEL'NYM RABOTAM [CONTRACT CAMPAIGN OF THE AIRPLANE BASES FOR EXTERMINATION WORK]. Grazhdan. Aviaîsiîa 1932, No. 11/12, p. 34. May 1932. [In Russian.] Libr. Cong.

Lists contracts for 1,437,870 ha. to be dusted in 1932.

BURCHE, E. F. (473)
PROBLEMY ROSTA SEL'SKOKHOZÎAISTVENNOĬ AVIAÎSII SSSR [PROBLEMS IN THE DEVELOPMENT OF AGRICULTURAL AVIATION IN THE U. S. S. R.]. Samolet, 1932, No. 4, pp. 14–18. April 1932. [In Russian.] Libr. Cong.

Describes the difficulties encountered since the introduction of the airplane for insect control in 1922. According to the 1932 plan the airplane is to take its place with other agricultural machines on the farm. Also discusses technical improvements in plane and dusting equipment, building of airdromes, and training of crews and pilots.

COWAN, C. S. (474)
FIGHTING HEMLOCK LOOPER [LAMBDINA FISCELLARIA] FROM THE AIR. DARING PILOTS MAKE HAZARDOUS FLIGHTS FORTY FEET OVER TREE TOPS TO RELEASE CARGOES OF CALCIUM ARSENATE DUST. Timberman 33 (5): 15, 32, illus. March 1932. 99.81 T484

Discusses operations in Pacific County, Wash., carried out by the State Department of Conservation, in cooperation with county officials, U. S. Bureau of Entomology, and private landowners. About 6,000 acres were infested. The contract was let to the Northwest Air Service, Inc., which provided a reconstructed Ryan monoplane (300-hp. Wright engine) equipped to take a pay load of 1,000 lb. A carefully worked out plan for loading, elimination of mechanical defects, etc., reduced the cost to $2.71 per acre. Describes equipment and operational details.

DRAKE, C. J., and DECKER, G. C. (475)
THE ROLE OF THE AIRPLANE IN GRASSHOPPER CONTROL. Jour. Econ. Ent. 25 (2): 189–195, illus. April 1932. 421 J822

In experimental work done in Iowa, 200,000 lb. of poisoned bran mash were applied at the rate of 20 lb. (10 lb. of dry bait) to the acre. Work was done between 5:30 and 9:20 each morning. The composition of the bait was 80 percent bran, 15 percent molasses, and 5 percent crude arsenic. This method resulted in even distribution of the mixture, and greatly reduced the danger of poisoning farm animals.

Discussion, pp. 195–196.

DZHAFARBEKOV, D. (476)
OTCHET EVLAKHSKOGO AVIAZVENA [REPORT OF THE EVLAKH AVIATION CREW]. Vsesoîûzn. Konf. po Aviakhim. Metodu Bor'by s Malîarieĭ, 1, Moskva, 1931, Mater., pp. 23–24. 1932. [In Russian.] 448.8 M469

Reprinted *from* Med. Parazitol. i Parazitar Bolezni 1 (2): 87–88. 1932.

Review of the work in central Azerbaidzhan. Paris green mixed with road dust (1: 3) was distributed over 27 sq. miles of water surface. Nearly 19 tons were used.

EVSTROPOV, I. (477)
AVIOMETOD—VEDUSHCHIĬ METOD BOR'BY S MAROKKSKOĬ KOBYLKOĬ [AERIAL-METHOD—LEADING METHOD IN THE CONTROL OF DOCIOSTAURUS MAROCCANUS]. Na Zashch. Sotsialist. Urozhaîa 1932, No. 3, pp. 27–29. February 1932. [In Russian.] Libr. Cong.

Gives historical account, with comparative tables, of locust control in Azerbaidzhan. Treatment by airplane has proved the most efficient method. Complete extermination has been hampered by lack of control in neighboring Persia. Some arrangement with the Persian Government will be necessary before completely successful results can be obtained.

FIGUEIRA, L., and LANDEIRO, F. (478)
RELATÓRIO DO PRIMERIO ANO DE LUTA ANTISEZONÁTICA (1931). Inst. Bact. Cam. Pestana. Arq. 6 (3): [191]–243, illus. 1932. [In Portuguese. French summary, pp. 242–243.] 448.3 R22

Account of work done against *Anopheles maculipennis* at Benavente, Portugal. Paris green was applied to the rice fields by airplane.

FLEURY, A. C. (479)
REPORT FOR CALIFORNIA. Calif. Dept. Agr. Spec. Bul. 115 (Proc. 10th–13th Ann. Conf. West. Plant Quar. Bd.), pp. 153–157. Sacramento, 1932. 8 C121S

Airplane inspection, pp. 154–155.

GAC, J. (480)
OPYLANIE SAMOLOTEM CZY MOTOREM [DUSTING BY PLANE OR BY MACHINE]. Sylwan, No. 4, pp. 131–140. 1932. [In Polish.] N. Y. State Libr.

Photoprint in U. S. Department of Agriculture Library. 423 G112

Advocates the aviochemical method for dusting against forest insects. Gives formulas, derived from a series of experiments on various estates, which can be used to express the relation between the quantity of poison released and the thickness of the deposit. Diagrams illustrate the effects of several different altitudes of flight, particle size of insecticide used, and varying meteorological conditions. Also refers to and illustrates the dusting apparatus described by Dr. Kienitz. Author believes that expenditures are justified by results.

GEIGER, R. (481)
METEOROLOGISCHE BEOBACHTUNGEN BEI DER MITTELFRÄNKISCHEN KIEFERN-EULENBEKÄMPFUNG MIT FLUGZEUG UND MOTOR IM FRÜHJAHR 1931. Ztschr. f. Angew. Ent. 19 (2): 207–222, illus. June 1932. 421 Z36

Report on dusting with Forstesturmit against *Panolis flammea* over Bayern forests. Air movement is the only meteorological factor. The microclimate of forest stands and terrain influences air currents. Early morning and early evening hours are the most favorable. Wind velocity should not exceed 2 miles per hr. The atmospheric conditions peculiar to a forest and certain physical obstacles which affect even distribution of the dust make motor dusting from the ground less efficient than airplane application.

GINSBURG, J. M. (482)
AIRPLANE OILING TO CONTROL MOSQUITOES. Science 75 (1951): 542. May 20, 1932. 470 Sci2

Summarized *in* Sci. News Letter 22 (593): 112. Aug. 20, 1932. 470 Sci24

Spraying New Jersey marshes with oil by means of specially adapted airplane. Mechanical details of the equipment are given.

GOLOVIZNIN, D., ORLOV, P., and TSYGANKOV, S. [N.] (483)
BOR'BA S VREDITELÎAMI KHLOPCHATNIKA [CONTROL OF COTTON PESTS]. Vsesoîûzn. Aviakhim. Konf., 1, Moskva, 1930, Mater., pp. 158–173. 1932. [In Russian.] 422.52 V963

Dusting experiments in southern Kazakhstan in July and August 1930. Deals solely with technique and not with effect on insects. Flowers of sulfur were used against *Tetranychus telarius*, nicotine against aphids, and calcium

arsenite against *Heliothis obsoleta* or *Laphygma exigua*. Most effective flying height was not over 17 ft. although actual heights varied from 10 to 32 ft. according to nature of insecticide and strength of wind. Plane covered 400 acres in from 6 to 8 hr., releasing 18 lb. of dust to the acre. Most effective between 4 to 10 a. m. and 8 to 10 p. m.

GRIFFITTS, T. H. [D.], and GRIFFITTS, J. J. (484)
SUR LE TRANSPORT DES MOUSTIQUES PAR LES AVIONS. Off. Internatl. d'Hyg. Pub. Paris. Bul. Mens. 24 (6): 948–952. June 1932. 449.75 Of2

Abstract *in* Trop. Dis. Bul. 29: 825–826. 1932.

Detailed account, describing planes, collecting apparatus, and methods used in experiments. Authors conclude that infected passengers are more dangerous in the spread of epidemics than infected mosquitoes.

GRĪŪNER, M. (485)
AĖRODROM V PUSTYNE [AN AIRDROME IN THE DESERT]. Na Zashch. Sotsialist. Urozhaĭ 1932, No. 21/22, pp. 18–19, illus. November 1932. [In Russian.] Libr. Cong.

Describes efforts of the aviation crew near Erden, Chemche, and Syr-ĪAzy to save the cotton crop from locusts. Invading swarms were carried by wind currents from Afghanistan.

——— (486)
ĪAKSHI SAMOLET [GOOD AIRPLANE]. Na Zashch. Sotsialist. Urozhaĭ 1932, No. 15, pp. 23–24. August 1932. [In Russian.] Libr. Cong.

How an airplane saved the cotton crop from locusts in the Nur-Ata mountain area, Uzbekistan.

——— (487)
PERVYE ITOGI RABOT AVIOMETODOM V 1932 GODU [FIRST RESULTS OF 1932 AVIOCHEMICAL WORK]. Na Zashch. Sotsialist. Urozhaĭ 1932, No. 14, pp. 11–16. July 1932. [In Russian.] Libr. Cong.

Describes locust control work in the republics of Central Asia. The planned assignment could have been more efficiently completed if: (1) More educational work with the public had preceded it; (2) better living conditions had been provided for the crews; (3) the manufacturers had not sent insecticides in defective containers which caused poisoning among workers handling them. Reviews the specific problems of each republic.

HUBAULT, E. (488)
TRAITEMENT DE MASSIFS ATTAQUÉS PAR UN LÉPIDOPTÈRE AU MOYEN D'UN INSECTICIDE PULVÉRULENT. Rev. des Eaux et Forêts 70 (8): [682]–684. August 1932. 99.8 R322

Discusses paper by Geiger (item 481).

IREDELL, A. W. (489)
AN ACCOUNT OF MOSQUITO-PROOFING CARRIED OUT BY THE ROYAL AIR FORCE IN INDIA. Roy. Soc. Med. [London] Proc. 26 (1): 1–5. November 1932. Libr. Cong.

Discusses results of proofing barracks, etc., at Karachi and Kohat in terms of effect on the health of personnel.

ISAEV, L. M. (490)
OPYT PRIMENENIĪA AVIAKHIMMETODA V UZBEKISTANE [EXPERIMENT IN USING THE AVIOCHEMICAL METHOD IN UZBEKISTAN]. Vsesoīuzn. Konf. po Aviakhim. Metodu Bor'by s Malārieĭ, 1, Moskva, 1931, Mater., pp. 33–39. 1932. [In Russian.] 448.8 M469

Also *in* Med. Parasitol. i Parazitar. Bolezni 1 (2): 97–103. 1932.

Discussion of the reason for survival of larvae in water reservoirs dusted 4 to 6 times in 7 weeks. When the planes flew high enough to avoid telegraph poles and buildings, the distribution of the dust was uneven. Defects in the dusting apparatus made it impossible to obtain an effective dust strip of sufficient width. Cattle, fish, and aquatic vegetation were not affected by the paris green.

JANYES, H. A. (491)
COLLECTING PARASITES OF THE SUGARCANE BORER IN SOUTH AMERICA. Jour. Econ. Ent. 25 (1): 64–68. February 1932. 421 J822

No *Telenomus* specimens emerged from parasitized egg clusters of *Diatraea saccharalis* shipped from Argentina to New Orleans by boat, but a few emerged from those shipped by airplane.

KING, H. H., and RUTTLEDGE, W. (492)
ON EXPERIMENTS IN THE USE OF POISON DUSTS AGAINST ADULT LOCUSTA MIGRATORIOIDES, RCH. & FRM., IN THE SUDAN. Bul. Ent. Res. 23 (1): 65–68. March 1932. 421 B87

Preliminary report on laboratory experiments with sodium arsenite to test effects of a dust cloud on flying locusts. Results indicate that airplane dusting tests are justified.

KOROTKIKH, G. I. (493)
ISTORIÍA I PERSPEKTIVY PRIMENENIÍA SAMOLETOV V SSSR V BOR'BE S VREDITELÍAMI [HISTORY AND PERSPECTIVES IN THE UTILIZATION OF PLANES IN U. S. S. R. IN PEST CONTROL]. Vsesoûzn. Aviakhim. Konf., 1, Moskva, 1930, Mater., pp. 30–41. 1932. [In Russian.] 422.52 V963

Gives the history and development of the technique of pest control by airplanes in the U. S. S. R. in the years 1921–31.

——— (494)
ORGANIZATSIÍA RABOT PO PRIMENENIÍÛ SAMOLETOV DLÍA BOR'BY S VREDITELÍAMI [THE ORGANIZATION OF WORK CONNECTED WITH THE USE OF AIRPLANES FOR THE CONTROL OF PESTS]. Vsesoûzn. Aviakhim. Konf., 1, Moskva, 1930, Mater., pp. 41–54. 1932. [In Russian.] 422.52 V963

Account of the methods of planning the work and marking the area to be dusted. Rate of application, damage to plants, and width of dust strips are mentioned.

——— (495)
PRIMENENIE SAMOLETOV DLÍA BOR'BY S VREDITELÍAMI SEL'SKOGO I LESNOGO KHOZÍAÏSTVA [THE USE OF AIRPLANES IN THE CONTROL OF FARM AND FOREST PESTS]. 231, [1] pp. Moskva, Gosudarstvennoe Izd. Sel'skokhozíaĭstvennoĭ i Kolkhoznokooperativnoĭ Literatury, 1932. [In Russian.] 423 K843

Includes history of the use of the airplane in insect control; details of planes, hoppers, etc.; the airdrome and its equipment; physical and chemical properties of dusts used; work of the ground crew and its coordination with that of the pilots; behavior of the dust cloud and distribution of the poison; methods for planning work; problems encountered under various conditions; costs; etc.

Reviewed by G. Samoĭlovich *in* Izv. Lesotekh. Akad. Leningrad 1933, No. 3, pp. 198–199. 99.9 L542

——— (496)
SAMOLET—SEL'SKOKHOZÍAÏSTVENNAÍA MASHINA. NOVYE PUTI PRIMENENIÍA SAMOLETA V SOTSIALISTICHESKOM SEL'SKOM KHOZÍAÏSTVE [THE AIRPLANE—AN AGRICULTURAL MACHINE; NEW METHODS OF UTILIZING THE AIRPLANE IN THE SOCIALIST AGRICULTURAL ECONOMY]. Tekh. Sotsialist. Zeml. 1932, No. 1, pp. 12–13, illus. January 1932. [In Russian.] 58.8 T23

During 1931 the airplane was used in the control of crop pests and diseases on 137,800 ha. In Transcaucasus, North Caucasus, Lower and Central Volga, and Central Asia 110,000 ha. were treated for the control of larvae of malarial mosquitoes.

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SAMOLET—ZVENO SOTSIALISTICHESKOĬ SISTEMY MASHIN SEL'SKOGO KHOZÍAÏSTVA [THE AIRPLANE AS A LINK IN THE SOCIALISTIC SYSTEM OF AGRICULTURAL MACHINERY]. Mekhanizatsiía Sotsialist. Sel'sk. Khoz. 3 (6): 25–27. June 1932. [In Russian.] Libr. Cong.

Discusses the importance of extending the use of airplanes in the field of agriculture and stresses need for developing special types of planes suited to specific operations. Cites effective work of airplanes in crop dusting and in control of malarial mosquitoes.

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SDEL'SHCHINA V AVIOOTRÎADAKH [PIECE WORK IN THE AVIATION CREWS]. Na Zashch. Sotsialist. Urozhaî 1932, No. 11/12, pp. 13–15. June 1932. [In Russian.] Libr. Cong.

Discusses system of payment based on individual accomplishments of pest-control workers. Judgment based on speed and skill in completing assignment, number of flights, economical use of poisons and fuel, etc.

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TEKHNICHESKIE VOZMOZHNOSTI I PÎATILETNIĬ PLAN PRIMENENIÎA SAMOLETOV DLÎA BOR'BY S MALÎARIEĬ [TECHNICAL POSSIBILITIES AND A FIVE-YEAR PLAN FOR USING AIRPLANES IN THE CONTROL OF MALARIA]. Vsesoîuzn. Konf. po Aviakhim. Metodu Bor'by s Malîarieĭ, 1, Moskva, 1931, Mater., pp. 8–10. 1932. [In Russian.] 448.8 M469

Reprinted from Med. Parazitol. i Parazitar. Bolezni 1 (2): 72–74. 1932.

Reviews problems to be overcome in carrying out the 5-year plan for eradication of malaria from U. S. S. R. The supply of paris green was not sufficient, and a large amount was produced in a paste form containing 50 percent water. Experiments were being made with Naftogumbrin, a byproduct of cleaning benzene.

KUDRÎAVTSEV, V. A. (500)

OPYT PRIMENENIÎA AVIAKHIMICHESKOGO METODA BOR'BY S MALÎARIEĬ V STALINGRADE [AN EXPERIMENT IN THE USE OF THE AVIOCHEMICAL METHOD IN THE CONTROL OF MALARIA IN STALINGRAD]. Vsesoîuzn. Konf. po Aviakhim. Metodu Bor'by s Malîarieĭ, 1, Moskva, 1931, Mater., p. 30. 1932. [In Russian.] 448.8 M469

Also *in* Med. Parazitol. i Parazitar Bolezni 1 (2): 94. 1932.

About 60 sq. miles of water were treated at intervals of 10 days. All older larvae and 97 percent of the younger larvae were killed.

LLOYD, B. J. (501)

PAN AMERICAN COOPERATION IN PUBLIC HEALTH WORK. THE PAN AMERICAN SANITARY CONFERENCES AND THE PAN AMERICAN SANITARY BUREAU. Pan Amer. Union Bul. 66 (4): 246–259, illus. April 1932. 150.9 M76

Maps show yellow fever areas in North and South America in relation to air routes, pp. 256–257.

MAKUNIN, F. (502)

LUCHSHE ISPOL'ZOVAT' OSTAÎUSHCHIESIÎ ZIMNIE MESIÎTSY NA PODGOTOVKU AVIORABOT 1932 GODA [BEST UTILIZATION OF REMAINING WINTER MONTHS TO PREPARE FOR 1932 AVIOCHEMICAL WORK]. Na Zashch. Sotsialist. Urozhaî 1932, No. 3, p. 19. February 1932. [In Russian.] Libr. Cong.

Work must be carefully planned if greater efficiency is to be achieved.

MARCUS, B. A. (503)

EIN NEUES KONTAKTMITTEL ("FORESTIT"-MERCK) IN DER SCHÄDLINGSBEKÄMPFUNG. Ztschr. f. Angew. Ent. 19 (1): 68–84, illus. March 1932. 421 Z36

Describes experiments in Bayern over pine woods infested with *Panolis flammea*. The insecticide acts on the nerves and muscles, and almost 100 percent larval mortality was obtained when used at 44 lb. per acre. Since the action is immediate, subsequent weather conditions do not affect efficiency.

References, p. 84.

MARK, F. A. (504)

AGRICULTURAL AVIATION. West. Flying 11 (4): 17. April 1932. Libr. Cong.

Includes brief discussion of insect control.

MIKHAĬLOV-SENKEVICH, ÎA. M. (505)

NOVYĬ AÈROPYL [NEW AIRPLANE DUSTER]. Na Zashch. Sotsialist. Urozhaî 1932, No. 6, pp. 23–24, illus. [March] 1932. [In Russian.] Libr. Cong.

Gives instructions for the operation of new apparatus and for the elimination of dusting difficulties created by the 1931 models.

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PROBLEMA MEKHANIZATSII AVIOKHIMMETODA BOR'BY S VREDITELIAMI RASTENIĬ [THE PROBLEM OF MECHANIZING THE AVIOCHEMICAL CONTROL OF PLANT PESTS]. Vsesoiuzn. S"ezd po Zashch. Rast. 7, Leningrad, 1932, Bul. 7: 15–17. [In Russian.] 423.92 V96

In the years preceding the second 5-year plan, the main objective in airplane pest control was an increase in the number of projects treated. The second plan will concentrate on quality of work and economy of operation. Suggests improvements which should be made in equipment and methods.

MILLER, F. W. (507)

THE AEROPLANE AS AN AID IN INSPECTION AND SURVEY WORK. N. J. Mosquito Extermin. Assoc. Proc. (1932) 19: 73–78. 420 N46

The New Jersey counties which attempt mosquito control contain 185,000 acres of salt marshes, of which about 160,000 are ditched or partly ditched. The airplane provides a speedy, practical, and economical means of inspection and survey. An opportunity is also provided for aerial photography and mapping.

Discussion, pp. 78–79.

N., A. (508)

OT TYSIACHI K MILLIONU (K ITOGAM 10-LETNEGO PRIMENENIIA SAMOLETA DLIA BOR'BY S VREDITELIAMI S-KH. RASTENIĬ [FROM A THOUSAND TO A MILLION (ON THE RESULTS OF 10 YEARS' UTILIZATION OF THE AIRPLANE IN CONTROL OF CROP PESTS]. Na Zashch. Sotsialist. Urozhaia 1932, No. 21/22, pp. 13–17, illus. November 1932. [In Russian.] Libr. Cong.

Agricultural use of the airplane was first proposed in the U. S. S. R. in 1922. A chronological account is given of the work, through the 1932 achievement of dusting 900,000 ha.

NABOKOV, V. A. (509)

BOR'BA S LICHINKAMI MALIARIĬNYKH KOMAROV [CONTROL OF THE LARVAE OF THE MALARIAL MOSQUITOES]. Vsesoiuzn. Aviakhim. Konf., 1, Moskva, 1930, Mater., pp. 55–88. 1932. [In Russian.] 422.52 V963

Experiments in airplane dusting of anopheline larvae near Moscow in 1929 and in Azerbaidzhan in 1930. For large areas the planes flew at 32 to 65 ft., for small accumulations of water at about 16 ft. About 20,000 acres were covered. Effective width of strips averaged 400 ft. Paris green mixed with equal parts of talc or road dust was applied at the rate of 7 to 10 oz. per acre in the case of submerged vegetation and 0.9 lb. to the acre with dense vegetation above the surface. In 24 hr. all older and 60 to 80 percent of young larvae were killed. With repeated dusting, mortality rose to 75 to 100 percent, and after 10 days there was a marked decrease in rate of infestation.

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O PODGOTOVKE KADROV DLIA MALIARIĬNYKH AVIAOTRIADOV [CONCERNING THE TRAINING OF CREWS FOR THE MALARIAL DETACHMENTS]. Vsesoiuzn. Konf. po Aviakhim. Metodu Bor'by s Maliarieĭ, 1, Moskva, 1931, Mater., pp. 40–41. 1932. [In Russian.] 448.8 M469

Reprinted *from* Med. Parazitol. i Parazitar. Bolezni 1 (2): 104–105. 1932.

Intensive preparation and training of specialists and other workers are required to carry out the plans for increasing the number of hectares (110,000) dusted in 1931 to 15,000,000 in 1937.

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ORGANIZATSIIA AVIAKHIMICHESKOĬ BOR'BY S LICHINKAMI MALIARIĬNOGO KOMARA [ORGANIZING THE AVIOCHEMICAL CONTROL OF THE LARVAE OF THE MALARIA MOSQUITO]. Vsesoiuzn. Konf. po Aviakhim. Metodu Bor'by s Maliarieĭ, 1, Moskva, 1931, Mater., pp. 11–16, illus. 1932. [In Russian.] 448.8 M469

Reprinted *from* Med. Parazitol. i Parazitar. Bolezni 1 (2): 75–80. 1932.

Describes the progress made from 1929 to 1931, and proposes a plan for organization of operations and the delegation of responsibility.

NABOKOV, V. A., and UTKIN, B. G. (512)
PRIMENENIE SAMOLETOV V BOR'BE S MALÎARIEĬ V AZERBAĬDZHANE V 1930 GODU [THE USE OF AIRPLANES IN THE CONTROL OF MALARIA IN AZERBAIDZHAN IN 1930]. Vsesoîuzn. Konf. po Aviakhim. Metodu Bor'by s Malîarieĭ, 1, Moskva, 1931, Mater., pp. 44–49, illus. 1932. [In Russian.] 448.8 M469

Reprinted *from* Med. Parazitol. i Parazitar. Bolezni 1 (2): 108–113. 1932.

Describes control of *Anopheles* larvae on Muganskaîa (where 90 percent of the work was done) and Shirvanskaîa steppes. Gives brief account of equipment used and of special precautions taken for protection of the crew. Dusting was carried on from 3:30 to 7:30 a. m. and from 6 to 7:30 p. m. when weather conditions were favorable. Discusses method used to determine degree of infestation by estimating number of larvae. Paris green, mixed with either talc or road dust, was applied at 0.5 to 0.75 kg. per ha. A total of 8,300 ha. were dusted, which exceeded the plan by 2,300 ha. Older larvae were more readily killed than younger.

NEVSKIĬ, V. (513)
KRATKIĬ SPRAVOCHNIK PO BOR'BE S VREDITELÎAMI SADOVODSTVA I VINOGRADARSTVA SREDNEĬ AZII [A BRIEF GUIDE TO THE CONTROL OF ORCHARD AND VINE PESTS IN CENTRAL ASIA]. 138 pp., illus. Moskva, Ob'edinenie Gosud. Izd. Sredne-Aziatskoe Otdelenie, 1932. [In Russian.] 423 N41

Includes general information on airplane dusting. Cites experimental dusting over an area of 80 ha. on the state farm of Uzsadvintrest. This was the first work done in Central Asia, the second in U. S. S. R.

ORLOV, P. (514)
OPYTY PO BOR'BE S SADOVYMI VREDITELÎAMI [EXPERIMENTS IN THE CONTROL OF ORCHARD PESTS]. Vsesoîuzn. Aviakhim. Konf., 1, Moskva, 1930, Mater., pp. 210–220. 1932. [In Russian.] 422.52 V963

Account of dusting from mid-May to mid-June 1930 against *Hyponomeuta padella*. Calcium arsenate (containing from 9 to 23 percent of arsenic pentoxide) 100 parts, flowers of sulfur 30 parts, and paris green 2 parts, was used at the rate of 23.4 lb. per acre. Planes flew at a height of 16 to 32 ft. above trees, laying a strip with a maximum width of 330 ft. and an effective width of 100 ft. Maximum kill was 50 percent of larvae and 4 percent of pupae. No effect on fungi. No damage to foliage or fruit. The dust settled well on the trees, and the failure to obtain a high kill was laid to the low percentage of arsenic pentoxide in the calcium arsenate.

OSSOWSKI, L. [L.] (515)
WALKA Z SÓWKA W SWIETLE NAJNOWSZYCH BADAŃ [CONTROL OF THE OWL MOTH BASED ON THE LATEST RESEARCH]. Sylwan, 1932, No. 2, pp. [37]–45. [In Polish.] N. Y. State Libr.

Describes methods of control which preceded the introduction of Forestit to the world market by the Merck Chemical Company and gives comparative characteristics of calcium arsenite and Forestit, stressing advantages of the latter. Also refers to the first dusting with Forestit against *Panolis flammea* in Franconia, in 1930, and discusses advantages and disadvantages of dusting by airplane and by the circular motor.

PANAMA CANAL ZONE HEALTH DEPARTMENT. (516)
REPORT (1931). 127 pp., illus. Mount Hope, Panama Canal Press, 1932. 152.43 H34A

J. F. Siler, Chief Health Officer.

Partial contents: Mosquito breeding areas in the vicinity of Panama City, and their control by dusting with paris green from airplanes, pp. 59–64.

PARKER, J. R., and SHOTWELL, R. L. (517)
DEVASTATION OF A LARGE AREA BY THE DIFFERENTIAL AND THE TWO-STRIPED GRASSHOPPERS [MELANOPLUS BIVITTATUS AND M. DIFFERENTIALIS]. Jour. Econ. Ent. 25 (2): 174–187. April 1932. 421 J822

Authors believe that the first airplane scattering of poisoned bran mash was done by John Halgrimson of Winner, S. Dak., in 1930. The following summer, arrangements were made with him to treat a heavily infested 240-acre field. The cost was 13.3¢ per acre, and an excellent kill resulted. Gives details of another test over a 200-acre field. With a larger plane and a better feeding device, the cost would probably be reduced to 10¢ per acre. This method should have an important place in future control campaigns.

POTAPOV, A. N. (518)

BOR'BA S SARANCHEĬ V DAGESTANE [LOCUST CONTROL IN DAGESTAN]. Vsesoĭuzn. Aviakhim. Konf., 1, Moskva, 1930, Mater., pp. 136–144. 1932. [In Russian.] 422.52 V963

Five airplanes were used against *Locusta migratoria* over 200 acres of swampy reed beds, in 533 flights of 20 min. each. A total of 464 acres were covered per flying hr. The number of machines proved greater than was needed for the area. Results of dusting are not given.

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SAMOLET V BOR'BE S AZIATSKOĬ SARANCHEĬ V DSSR V 1931 G. [USE OF THE AIRPLANE IN THE CONTROL OF THE ASIATIC LOCUST IN THE DAGESTAN SOVIET SOCIALISTIC REPUBLIC IN 1931]. Inst. Bor'by s Vred. v Selsk. Lesn. Khoz. Izv. 2; [59]–[115], illus. Leningrad, 1932. [In Russian.] 423.92 L453

Describes planning, organization, and management of airplane control work against *Locusta migratoria* in the reed beds of Dagestan. The area dusted amounted to 18,982 ha. instead of the 17,664 planned; 46,187 kg. of sodium arsenite and 8,612 kg. of calcium arsenite were used. The dosage per ha. averaged 2.9 kg. Five planes made 318 flights in 30 working days, an average of 2 flights a day per plane. Results were satisfactory, but the autumn survey showed a reinfestation with eggs laid by swarms migrating from other regions.

PUKHOV, B. A. (520)

SOVREMENNYE SPOSOBY BOR'BY S VREDITELIÂMI [MODERN METHODS OF PEST CONTROL]. Tekh. Sotsialist. Zeml. 1932, No. 6, pp. 18–21, illus. June 1932. [In Russian.] 58.8 T23

Large-scale use of the airplane in locust control was first made over the inaccessible reed beds of Dagestan rivers. Sodium arsenite and calcium arsenite, used at the rate of 3 to 4 kg. per ha., covered all plants evenly. Experiments have shown that bait for locust control can also be spread by airplanes.

RAFES, P. M. (521)

BOR'BA S SARANCHEĬ V KUBANSKIKH PLAVNÎAKH [LOCUST CONTROL IN THE REED BEDS OF THE KUBAN PROVINCE]. Vsesoĭuzn. Aviakhim. Konf., 1, Moskva, 1930, Mater., pp. 120–136. 1932. [In Russian.] 422.52 V963

The reed beds and flood areas of Kuban were dusted for control of *Locusta migratoria*. Calcium arsenite was used at about 2.7 lb. per acre. Planes flying at an altitude of 33 to 40 ft. applied the dust in ribbons about 330 ft. wide and covered about 439 acres in one flying hr. Dust was too heavy in center of strip and too light on edges, areas on either side of center being effective. A gusty wind, or one of more than 9 miles per hr., made dusting ineffective. No scorching of vegetation was noticed. The calcium arsenite must be carefully packed as it absorbs moisture readily and becomes unsuitable for use. Aerial method is economical for large continuous areas.

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METODIKA AVIORABOT PO BOR'BE S SARANCHOĬ [METHODS OF AVIATION WORK IN LOCUST CONTROL]. Na Zashch. Sotsialist. Urozhaîâ 1932, No. 6, pp. 21–23. [March] 1932. [In Russian.] Libr. Cong.

The various steps in the technique of airplane dusting are described. Stresses importance of coordinating ground and airplane work.

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OSVOIM SAMOLET V BOR'BE S VREDITELIÂMI [ADAPTING AIRPLANE FOR PEST CONTROL]. Na Zashch. Sotsialist. Urozhaîâ 1932, No. 1, pp. 5–6. January 1932. [In Russian.] Libr. Cong.

Planning and organizational problems.

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S.-KH. AVIATSIÎA V BOR'BE ZA URozhaĬ [AGRICULTURAL AVIATION IN THE HARVEST EFFORT]. Samolet 1932, No. 8/9, pp. 6–7. August/September 1932. [In Russian.] Libr. Cong.

Reviews the work of the various agricultural aviation bases on the control of insects; summarizes achievements for the season, which in some instances surpassed the planned operations, such as the eradication of the meadow moth (*Loxostege sticticalis*).

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SAMOLET V KHLOPKOVODSTVE (USE OF AIRPLANES FOR COTTON FARMING). Mekhanizat͡sii͡a Sot͡sialist. Sel'sk. Khoz. 3 (5): 3–4. May 1932. [In Russian.] Libr. Cong.

Describes the difficulties in cotton growing which the airplane helps to overcome. The airplane was first used against cotton insects in 1922 in the United States and has now become an important agricultural machine. Discusses work done in 1930 and 1931 in dusting cotton with sulfur for spider mites (*Tetranychus*) and with calcium arsenate for various insects. Also refers to bait spreading and use of paris green against mosquitoes.

REY, B. (526)

CROP DUSTING AS A BUSINESS. West. Flying 11 (6): 20–21, 57, illus. June 1932. Libr. Cong.

The president of Independent Crop Dusting, Inc. discusses an airplane dusting service in California. Stresses the need of planning and organization. The executive in control should be thoroughly familiar with pest control as well as airplane dusting operations. The salesman should also have general knowledge of pest control. The pilot should have full charge in the field and be acquainted with farming methods, kinds of crops, weather conditions, and airplane mechanics. In estimating costs, it is necessary to consider: (1) average load per trip, (2) time needed to distribute load, (3) number of loads averaged per hour, day, month, or season. Charges should be based on amount of material carried.

ROUBAND, E. (527)

LES RACES TROPHIQUES DE L'ANOPHELES MACULIPENNIS DÉCELÉES PAR LES ÉLEVAGES EXPÉRIMENTAUX COMPARÉS. [Paris] Acad. des Sci. Compt. Rend. 194 (19): 1694–1696. May 9, 1932. 505 P21

Part of the specimens used in the experiments were sent by airplane from Italy. Although they arrived apparently lifeless from cold, they were easily revived.

RUKAVISHNIKOV, B. I. (528)

OPYT PO BOR'BE S VREDITELI͡AMI SAKHARNOĬ SVEKLY [EXPERIMENT IN PEST CONTROL OF SUGAR BEET]. Vsesoi͡uzn. Aviakhim. Konf., 1, Moskva, 1930, Mater., pp. 88–109. 1932. [In Russian.] 422.52 V963

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RABOTY OPYTNOĬ ĖKSPEDIT͡SII VSESOI͡UZNOGO INSTITUTA ZASHCHITY RASTENIĬ PO BOR'BE S VREDITELI͡AMI SAKHARNOĬ SVEKLY V 1930 G. [THE WORK OF THE EXPERIMENTAL EXPEDITION OF THE INSTITUTE FOR PLANT PROTECTION ON THE CONTROL OF PESTS OF SUGAR BEET IN 1930]. Zashch. Rast. 8 (5/6): 489–513, illus. December 1931, pub. 1932. [In Russian.] 421 D36

Account of experiments in the Ukraine for the control of the meadow moth, *Loxostege sticticalis*, and the sugar-beet weevil, *Cleonus punctiventris*. Toxicity studies of several insecticides were made in the laboratory. Sodium fluorine compounds showed high toxicity rates and caused very little injury to foliage. Attempts should be made to manufacture them in suitable form for airplane dusting. Calcium arsenate proved most effective of the arsenicals. When applied by airplane, 6 to 7 lb. per acre, the resultant mortality of *Loxostege sticticalis* was 83.9 percent as opposed to 69.9 from hand dusting. There was slight scorching only when dew was very heavy. Results against the beet weevil were unsatisfactory by either method, perhaps due to weather conditions. The effect of wind and ascending air currents is discussed. In airplane dusting 20 to 40 percent of calcium arsenite, 30 to 75 percent of calcium arsenate, and about 90 percent of paris green were carried away.

SABININ, V. (530)

ORGANIZAT͡SIĬA OKHRANY TRUDA V AVIAOTRI͡ADAKH [ORGANIZATION FOR THE PROTECTION OF LABOR IN THE AVIATION SQUADRONS]. Vsesoi͡uzn. Aviakhim, Konf., 1, Moskva, 1930, Mater., pp. 220–227. 1932. [In Russian.] 422.52 V963

Discussion of the danger from insecticidal poisoning to which the workers in aviochemical pest control are exposed and of the resultant diseases. Methods of prevention and treatment are suggested.

Sazonov, I. V., and Stregulina, E. S. (531)
bor'ba s pautinnym kleshchikom (chorom) i lichinkami malĉariĭnogo komara v armenii [control of the red spider mite and of the larvae of the malarial mosquito in armenia]. Vsesoŭzn. Aviakhim. Konf., 1, Moskva, 1930, Mater., pp. 180–210. 1932. [In Russian.] 422.52 V963

Dusting cotton against *Tetranychus telarius* was done in July and August with flowers of sulfur. Could be done only between 4:30 and 7:30 a. m., as during the day and evening ascending air currents lifted the dust, which then settled over too large an area. A strip not more than 74 ft. wide was most effective and was obtained by planes flying at an altitude of 19 to 32 ft. Airplane dusting used 3 times as much dust as the ground check and only produced 0.6 percent higher mortality. The poor results were believed due to an unsatisfactory dust-releasing apparatus and to the tendency of sulfur to lump in the apparatus. A high rate of mortality was obtained against *Anopheles* with a mixture of paris green in road dust. The planes flew at 13 to 16 ft., releasing the mixture at the rate of 1 lb. per acre and forming an effective swath 400 to 600 ft. in width.

Schwerdtfeger, F. (532)
forleulenbekämpfung in der preussischen staatsoberförsterei neuendorf, regierungsbezirk potsdam. Deut. Forst-Ztg. 47 (40): 847–849. Sept. 30, 1932. 99.8 D48

About 6,000 acres near Potsdam, heavily infested with *Panolis flammea*, were dusted in June 1932. Four contact insecticides (Forestit, Verindal, Neurotol, and Derrothan) were all effective, the mortality ranging from 87 to 100 percent. It was the first large-scale application of contact dusts by plane against this insect and proved much more efficient than the arsenical compounds. The effect is almost immediate and does not depend on adherence to foliage. It is possible by an early application to save trees injured the preceding year.

Sergeev, A. I. (533)
za moshchnuŭ sel'skokhozĉaĭstvennuŭ aviaĉsiiŭ [for a vigorous agricultural aviation system]. Grazhdan. Aviaĉsiiâ 1932, No. 6, pp. 2–7, illus. March 1932. [In Russian.] Libr. Cong.

Address by the chief of the administration of Agricultural Aviation at the 2d All-Union Conference of the Civil Air Force (GVF).

The practical achievements of Agricultural Aviation in 1931 have determined the course of its development during the second 5-year plan. During the first plan the role of the airplane in pest control was underestimated; collectivization is responsible for the progress made in agricultural aviation. Gives comparative figures for 1930 and 1931, and discusses the new plan, which has been increased 500 percent. Gives suggestions for improvement and for solution of important problems in the Civil Air Force.

Sergiev, P. G. (534)
bor'ba s malĉarieĭ v 1932 g. i vo vtoroĭ pĉatiletke [malaria control in 1932 and during the second five-year plan]. Vsesoŭzn. Konf. po Aviakhim. Metodu Bor'by s Malĉarieĭ, 1, Moskva, 1931, Mater., pp. 5–8. 1932. [In Russian.] 448.8 M469

Reprinted from Med. Parazitol. i Parazitar. Bolezni 1 (2): 69–72. 1932.

A comprehensive malaria control program should include airplane dusting in reclaiming lands and marshes adjacent to inhabited areas.

Silin, G. (535)
aviaĉsiiâ v sel'skom khozĉaĭstve [aviation in agriculture]. Sel'sk. Khoz. Entsiklopediiâ 1: 21–23. 1932. [In Russian.] 30.1 Se42.

Refers to the significant place won by the airplane in the control of insects in the republics of the U. S. S. R. Tables give data on achievements for the years 1925–30.

Simskiĭ, A. (536)
raĉsionalizaĉsiiâ khimicheskogo kontrolâ raboty samoleta [common sense in the chemical checking of the work of the airplane]. Na Zashch. Sotsialist. Urozhaâ 1932, No. 8, pp. 9–10. April 1932. [In Russian.] Libr. Cong.

Account of laboratory work which developed a method of using veneer boards smeared with glycerin (in place of pans filled with solvents) for checking amounts of poison lost through failure to adhere to foliage.

SOLOV'EV, K. (537)

OPYT PRIMENENIÎA SAMOLETOV V BOR'BE S VREDITELÎAMI GORCHITSY V NIZNE-VOLZHSKOM KRAE [EXPERIMENT IN THE USE OF AIRPLANES FOR THE CONTROL OF MUSTARD PESTS IN THE LOWER VOLGA REGION]. Na Zashch. Sotsialist. Urozhaîâ 1932, No. 14, pp. 16–17. July 1932. [In Russian.] Libr. Cong.

Between May 26 and June 2, 1932, calcium arsenate was dusted over 1,670 ha. on the collective farms in the Dubovskiĭ district. The poison was applied at the rate of 8 kg. per ha., and resulted in a mortality of 80 to 90 percent.

*STENS. (538)

DIE VERMEHRUNG UND BEKÄMPFUNG DER FORLEULE [PANOLIS FLAMMEA] IN DER OBERFORSTEREI NEUENDORF. Deut. Holzwirtsch., No. 89, pp. 611–613. 1932.

STODDARD, W. B. (539)

AIRPLANES USED IN SPRAYING FIELDS. Seed World 31 (4): 18, illus. Feb. 19, 1932. 61.8 Se52

Refers to control of grasshoppers in truck gardens; quotes E. W. Dippold of the Capital Seed and Fuel Co., Phoenix, Ariz.

SURIN, N. ÎA. (540)

AVIATSIÎA NA FRONTE BOR'BY S VREDITELÎAMI [AVIATION ON THE PEST-CONTROL FRONT]. Tekh. Sotsialist. Zeml. 1932, No. 1, pp. 13–15, illus. January 1932. [In Russian.] 58.8 T23

Describes the advantages and technique of the aviochemical method; shows progressive use in U. S. S. R. from 2,257 ha. dusted in 1925 to 250,000 in 1931. Plans for 1932 are 1,500,000 ha.

SYTIN, V. (541)

BOR'BA AVIAMETODOM S MAROKKSKOĬ KOBYLKOĬ V AZERBAIDZHANE [CONTROL OF THE MOROCCAN LOCUST (DOCIOSTAURUS MAROCCANUS) IN AZERBAIDZHAN BY THE AERIAL METHOD]. Vsesoîuzn. Aviakhim. Konf., 1, Moskva, 1930, Mater., pp. 173–180. 1932. [In Russian.] 422.52 V963

Difficulties in the use of poison bait led to trial in 1930 of airplane dusting against *Dociostaurus maroccanus* on the hilly steppes of Azerbaidzhan. About 25,000 acres were treated with pure sodium arsenite and with a mixture of sodium arsenite and calcium arsenite at 2.2 to 3.2 lb. per acre. About 100 acres were covered in 12-min. flights, and 90 to 100 percent mortality resulted. The hopper stages could be detected by airplane scouting. The hopper bands themselves, and a belt of 50 to 100 yds. wide in front of them, were dusted.

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MINUS STO TYSÎACH TRUDOLET [MINUS 100,000 YEARS OF WORK]. Na Zashch. Sotsialist. Urozhaîâ 1932, No. 3, pp. 24–25, illus. February 1932. [In Russian.] Libr. Cong.

Discusses work time lost because of malaria, and governmental orders to eradicate the disease by use of the airplane in mosquito control. OBV plans to treat 870,000 ha. in 1932 and 15,000,000 ha. in 1937.

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SOTSIALISTICHESKAÎA SEL'SKOKHOZÎAĬSTVENNAÎA I LESNAÎA AVIATSIÎA (USE OF AVIATION IN THE SOCIALISTIC AGRICULTURE AND FOREST MANAGEMENT). Mekhanizatsiîa Sotsialist. Sel'sk. Khoz. 3 (2): 7–8. February 1932. [In Russian.] Libr. Cong.

Describes the contributions of the airplane to the success of socialist agriculture, especially in the field of pest control. Reviews dusting operations in 1930 and 1931.

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TEKHNIKA VKLÎUCHENA [TECHNIQUE IS INCLUDED]. Na Zashch. Sotsialist. Urozhaîâ 1932, No. 21/22, pp. 10–12, illus. November 1932. [In Russian.] Libr. Cong.

Popular account of technical progress in the U. S. S. R., including the use of the airplane in pest control.

TROCHAIN, J. (545)

L'AVIATION AU SERVICE DE L'AGRONOME ET DU BOTANISTE. Rev. des Forces Aériennes, Année 4, v. 2, No. 40, pp. 1227–1251, illus. November 1932. Libr. Cong.

Reviews insecticidal dusting experiments in the United States, the Philippines, and Europe. Concludes that: (1) dusts can be more easily and cheaply applied by airplane; (2) planes can be used where other methods are impossible; (3) the method can be used against grasshoppers in any stage of their development; (4) planes are invaluable for transporting men, supplies, and insecticides into isolated regions. Also discusses value of the airplane in the botanical field.

TROLLI, G. (546)

RAPPORT PRÉLIMINAIRE AU SUJET DE LA PRÉSENCE ET DE LA VITALITÉ DES INSECTES ET DES RATS, ET NOTAMMENT DES MOUSTIQUES, À BORD DES AVIONS AU CONGO BELGE. Off. Internatl. d'Hyg. Pub. Bul. 24 (4): 603–612. April 1932. 449.75 Of2

Living mosquitoes were found four times and only at Coquilhatville (twice on a plane arriving from Léopoldville and twice on a plane from Stanleyville, via Lisala). Both planes reached altitudes of about 1,000 m. Planes from Boma to Elisabethville reached altitudes of 1,700 to 2,400 m. All mosquitoes were dead at Elisabethville. Apparently, a high altitude and a long period in a plane are fatal to mosquitoes, but further experiments are necessary.

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RESULTATS D'UNE ENQUÊTE SUR LA PRÉSENCE ET LA VITALITÉ DES INSECTES ET RATS ET NOTAMMENT DES MOUSTIQUES À BORD DES AVIONS DE LA LIGNE LÉO-STANLEYVILLE. Inst. Roy. Colon. Belge. Bul. des Séances 3 (3): [601]-630. 1932. 504 B836

Further report on experiments in the Belgian Congo during the last half of 1932 on the air route between Léopoldville and Stanleyville. Lists and discusses the insects found in hangars and in planes. Those in the planes appear to have been introduced at stops along the route rather than at night stations. Describes vitality tests made with caged insects placed in the planes. Mortality was between 45 and 64 percent, and all mosquitoes which survived continued to live for long periods, with or without food. *Glossina palpalis* arrived in excellent condition. Concludes that mosquitoes infected with the virus of yellow fever can survive a trip of from 2 to 3 days and a maximum height of 6,500 ft. The danger can be avoided by strict inspection of airports and the disinfestation of planes at ports of call and at night stations.

T͡SIOPKALO, V. [L.] (548)

SAMOLET PROTIV SOSNOVOĬ PI͡ADENITS͡Y [AIRPLANES AGAINST THE PINE GEOMETRID (BUPALUS PINIARIUS L.)]. Vsesoi͡uzn. Aviakhim. Konf., 1, Moskva, 1930, Mater., pp. 144–158. 1932. [In Russian.] 422.52 V963

Report on work in the Ukraine.

Calcium arsenite at the rate of 5.4 to 6.3 lb. per acre was applied from July 1 to Sept. 5, 1930, on 5,000 acres. Infestation per tree amounted to from 100 to 56,000 insects. The mortality obtained was from 56 to 92.5 percent. Proved more economical than ground methods such as removing the litter or banding the trees.

VANNOTE, R. L. (549)

THE USE OF THE AEROPLANE FOR THE DISTRIBUTION OF OILS AND LARVICIDES. N. J. Mosquito Extermin. Assoc. Proc. (1932) 19: 97–101, illus. 420 N46

Reports on experiments made over the upper Passaic River Valley, N. J. Dusts made from fuel oil or pyrethrum larvicide mixed with either peat moss or sawdust proved unsatisfactory. The plane was then adapted for tests with liquid sprays. Pyrethrum larvicide was not effective because the wind-driven agitator could not keep the material thoroughly mixed and a power agitator was considered too expensive. Fuel oil sprayed at the rate of 180 gal. over 8 acres gave 98 percent mortality. The cost was estimated at $6.53 per acre as against $12.60 for hand spraying.

Discussion, pp. 101–102.

VSESOIUZNAIA AVIAKHIMICHESKAIA KONFERENTSIIA, 1st, MOSKVA. 1930. (550)
MATERIALY. AVIATSIIA V BOR'BE S VREDITELIAMI SEL'SKOGO I LESNOGO KHOZIAĬSTVA [PROCEEDINGS. AVIATION IN THE CONTROL OF AGRICULTURAL AND FOREST PESTS]. 232 pp., illus. Moskva, Sel'kolkhozgiz, 1932. [In Russian.] 422.52 V963

Proceedings of the All-Union Aviochemical Conference.

Partial contents: Rezoliutsii [Resolutions of the Conference . . .], pp. 227–231. The All-Union Aviochemical Conference having found the agricultural economy of U. S. S. R. deficient in knowledge. methods, organization, and technique of pest control resolved to concentrate its efforts: (1) On a comprehensive development of the science of pest control with special attention to the aviochemical field; (2) on the organization of the work and personnel; (3) on the perfection of dusting technique; (4) on the continuation of airplane control of the larvae of the malarial mosquito.

For rest of contents *see* items 463, 483, 493, 494, 509, 514, 518, 521, 528, 530, 531, 541, 548, 554.

VSESOIUZNAIA KONFERENTSIIA PO AVIAKHIMICHESKOMU METODU BOR'BY S MALIARIEĬ, 1st, MOSKVA, 1931. (551)
MATERIALY. AVIATSIIA V BOR'BE S MALIARIEĬ [AVIATION IN MALARIA CONTROL]. [52] pp. Moskva, 1932. [In Russian.] 448.8 M469

Reprinted *from* Med. Parazitol. i Parazitar. Bolezni 1 (2): 65–[116]. 1932.

At head of title: Vsesoiuznoe Ob"edienie po Bor'be s Vreditelіami v Sel'skom i Lesnom Khozіaĭstve (OBV NKZema SSSR) Tropicheskiĭ Institut Narkomzdrava RSFSR.

All-Union Conference on the Aviochemical Method of Malaria Control, edited by G. I. Korotkikh, A. M. Krantsfel'd, and V. A. Nabokov.

Partial contents: Predislovie (Preface) [In Russian and English], pp. 1–2; Resoliutsiia Pervoĭ Vsesoiuznoĭ Aviatsionnoĭ Konferentsii po Bor'be s Maliarieĭ [Resolution of the 1st All-Union Aviation Conference on the Control of Malaria], pp. 42–43; Literatura . . ., by G. I. Korotkikh, p. 49.

For rest of contents *see* items 471, 476, 490, 499, 500, 510, 511, 512, 534, 553, 555, 556.

WOLCOTT, G. N. (552)
METHODS OF INSECT CONTROL IN THE TROPICS. Canad. Field Nat. 46 (8): 174–177. November 1932. 410.9 Ot8

The airplane is employed in dusting cotton along the west coast of South America. Mass migrations of the strong-flying Peruvian cotton stainer (*Dysdercus* sp.) can be successfully met by airplane application of a patented German product locally known as "Polvos violetas."

ZELENUKHIN, I. A. (553)
AVIATSIIA V BOR'BE S MALIARIEĬ [AVIATION IN THE CONTROL OF MALARIA]. Vsesoiuzn. Konf. po Aviakhim. Metodu Bor'by s Maliarieĭ, 1, Moskva, 1931, Mater., pp. 3–4. 1932. [In Russian.] 448.8 M469

Also *in* Med. Parazitol. i Parazitar. Bolezni 1 (2): 67–68. 1932.

Opening speech at the conference. Purpose of the conference was to discuss the 5-yr. plan for control of malaria and point out new ways of organizing the work. Main points to be considered were: (1) correlation of airplane and ground operations, (2) production of new insecticides, (3) training of specialists and other workers.

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ZA KORENNUIU PERESTROĬKU DELA BOR'BY S VREDITELIAMI SEL'SKOGO I LESNOGO KHOZIAĬSTVA [FOR A RADICAL RECONSTRUCTION OF THE METHODS OF PEST CONTROL IN THE RURAL AND FOREST ECONOMY]. Vsesoiuzn. Aviakhim. Konf., 1, Moskva, 1930, Mater., pp. 3–30. 1932. [In Russian.] 422.52 V963

Analyzes and criticizes the pest-control system of U. S. S. R. from several angles, and urges a new integrated comprehensive outlook on the problem with especial attention to the use of the airplane and gases.

ZHADKEVICH, L. A. (555)
BOR'BA S MALIÂRIEĬ V RAĬONAKH RISOSEIÂNIIÂ NA SEVERNOM KAVKAZE [CONTROL OF MALARIA IN THE RICE-PRODUCING REGIONS OF THE NORTH CAUCASUS]. Vsesoûzn. Konf. po Aviakhim. Metodu Bor'by s Maliârieĭ, 1, Moskva, 1931, Mater., pp. 24–29, illus. 1932. [In Russian.] 448.8 M469

Also *in* Med. Parazitol. i Parazitar. Bolezni 1 (2): 88–93. 1932.

Work done near the Sea of Azov. Paris green was applied from an airplane in strips 360 to 410 ft. wide. The plane flew at about 23 ft. When pure paris green was used at the rate of 10½ oz. per acre, 10 percent mortality was reached in several test dishes. Pupae and 1st-stage larvae were not affected.

ZHUKOV, N. M. (556)
OTCHET SREDNEVOLZHSKOGO AVÍÂOTRÍÂDA [REPORT OF THE MIDDLE-VOLGA AIRPLANE DETACHMENT]. Vsesoûzn. Konf. po Aviakhim. Metodu Bor'by s Maliârieĭ, 1, Moskva, 1931, Mater., pp. 31–35, illus. 1932. [In Russian.] 448.8 M469

Also *in* Med. Parazitol. i Parazitar. Bolezni 1 (2): 95–97. 1932.

Covering vegetation necessitated increasing the dosage of paris green from 3½ oz. per acre to 7–14 oz. Mortality of all instars was from 94.3 to 100 percent.

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ACHUNDOW, I. (557)
UBER DEN HEUTIGEN STAND DER MALARIABEKÄMPFUNGSFRAGE IN ASERBAIDJAN. Arch. f. Schiffs u. Tropen Hyg. 37 (3): 136–141. March 1933. 449.8 Ar22

Refers to the organization of control measures, including airplane dusting with paris green over large *Anopheles* breeding areas.

*ALEKSEEV, R. (558)
OPYT OPREDELENIÂ NORM RAZMOLA ARSENITA KAL'TSIÂ, PRIMENÂEMOGO PRI AVIAOPYLIVANII [AN EXPERIMENT TO DETERMINE THE STANDARDS OF FINENESS OF CALCIUM ARSENITE USED IN DUSTING FORESTS FROM AIRPLANES]. Sotsial. Lesn. Khoz. i Agrolesomel., No. 3, pp. 68–74, illus. 1933. [In Russian.]

The Korotkikh and Rafes bibliography (p. IV) cites this on p. 54.

Field tests were carried out in the Ukraine in May and June 1931, and again in June 1932, against *Panolis flammea*, using arsenic containing 70.2 percent As_2O_3. The distribution of the dust was checked by the amounts which settled in dishes of water. It was concluded that 75 percent of the dust may be lost because of the presence of particles of either too large or too small a diameter. Only 14 percent of the amount released settles in the crowns of the trees, and 66 percent of this is in particles too large for the larvae to ingest. Recommends that the dust used should consist of particles from 0.053 to 0.061 mm. in diameter.—Abstract *in* Rev. Appl. Ent. A 22: 55–56. 1934.

ANDERS, A. K. (559)
AVIAITSIÂ NA SLUZHBE SEL'SKOGO I LESNOGO KHOZÍÂĬSTVA STRANY SOTSIALIZMA [AVIATION IN THE SERVICE OF AGRICULTURE AND FORESTRY IN THE U. S. S. R.]. Grazhdan. Aviatsiiâ 3 (2): 15–[18], illus. February 1933. [In Russian.] Libr. Cong.

Reviews 10 years of aviation in agriculture. In 1922 the use of planes in pest control was declared to be fantastic; in 1925 the first hopper was constructed by Korotkikh and Mikhaĭlov-Senkevich for airplanes of Konek-Gorbunok type. Large-scale use of planes began in 1930 with collectivization. The 5-year plan, calling for airplane dusting of 346,000 ha., was actually finished in 3 years, with a total of 350,000 ha. treated. Also outlines the various stages of organizational management of agricultural aviation: (1) Aviakhim and Dobrolet; (2) from 1925 to 1930, Russian People's Comissariat and Dobrolet; (3) from 1931 to 1932, OBV; (4) from 1932, Glavnoe Upravlenie GVF.

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BOR'BA S VREDITELÎAMI SEL'SKOGO I LESNOGO KHOZÎAÏSTVA V 1933 G. [PEST CONTROL IN AGRICULTURE AND FORESTRY IN 1933]. Grazhdan. Aviaſsîâ 3 (12): 15–17. December 1933. [In Russian.] Libr. Cong.

Because of an insufficient supply of insecticides, together with incorrect and poorly timed regional distribution, the planned aviochemical work for 1933 had to be decreased. In spite of these difficulties effective pest control was achieved (3,110 flight hr., 1,839 tons of poison scattered). Mistakes were acknowledged by all workers, and every effort will be made to eliminate them from future operations.

BEĬ-BIENKO, G. [ÎÂ.] (561)

UROKI BOR'BY S SARANCHOVYMI V 1933 GODU [LESSONS FROM THE CONTROL OF LOCUSTS IN 1933]. Na Zashch. Sotsialist. Urozhaîâ 1933, No. 11, pp. 27–[30]. November 1933. [In Russian.] Libr. Cong.

Analyzes dusting work in Central Asia, and points out mistakes that could have been prevented by the use of a trained technical crew.

BEKLEMISHEV, V. N. (562)

OTKUDA BERUTSÎA VZROSLYE ANOPHELES V RAÏONE, PODVERGNUTOM AÉROVERDIFIKATSII [WHAT IS SOURCE OF ADULT ANOPHELES IN AREAS WHICH HAVE BEEN SUBJECTED TO AVIOCHEMICAL TREATMENT]? Med. Parazitol. i Parazitar. Bolezni 2 (1/2): 53–59, illus. 1933. [In Russian. German summary.] Libr. Cong.

During the summer of 1932 paris green was dusted, at intervals, over rice fields and adjoining marshes in the Lake Balkasch area of southeastern Kazakhstan. In August adults of *Anopheles maculipennis* were found in all villages, although no larvae were present. A study of the life cycle of the mosquito showed that the dust applications had not been correlated with larval development and that a new generation had matured from pupae unaffected by the poison.

BERLAND, L. (563)

TRANSPORT INVOLONTAIRE D'ARTHROPODES PAR AÉROPLANES, ET PAR LES COURANTS AÉRIENS À HAUTE ALTITUDE. Soc. de Biogéog. Compt. Rend. 10 (84): [49]–51. 1933. Amer. Geog. Soc. Libr.

Other writers have shown that insects can be transported by planes, especially in the fuselage. Grounded planes are often invaded by mosquitoes, cockroaches, flies, ants, etc. Discusses work of B. R. Coad (1931). Concludes that there is undoubtedly an aerial plankton, inactive and depending on air currents for dispersion. Similarity in climate between North America and Europe favors acclimatization when insects are carried from one to the other.

BORCHERS, F. (564)

BEMERKUNGEN ZU DER ARBEIT VON RUDOLF GEIGER: "METEOROLOGISCHE BEOBACHTUNGEN BEI DER MITTELFRÄNKISCHEN KIEFERNEULENBEKÄMPFUNG MIT FLUGZEUG UND MOTOR IM FRUHJAHR 1931." Ztschr. f. Angew. Ent. 20 (1): 117–125. April 1933. 421 Z36

Contends that it is not necessarily true that meteorological factors make power dusting less effective than airplane dusting. These conditions act differently on different materials. The action of the power duster used by Geiger is not typical of that of dusters of all patterns. Geiger's conclusions would conflict with the known fact that a majority of the power dusting done is successful.

BOYÉ. (565)

L'UTILISATION DE L'AVION À MADAGASCAR DANS LA PROPHYLAXIE ANTIPALUDIQUE POUR L'ÉPANDAGE DU "VERT DE PARIS." Off. Internatl. d'Hyg. Pub. [Paris], Bul. Mens. 25 (10): 1766–1768. October 1933. 449.75 Of2

In 1932 marshes and rice fields in Madagascar were successfully dusted with paris green from an airplane to destroy *Anopheles* larvae. Sufficient amounts of road dust were not available as a carrier, and the best substitutes tested were sifted wood ashes, slaked lime, or waste flour. The results were most satisfactory when the planes flew at a height of 16 to 33 ft. in windless weather. After five treatments at 10-day intervals, larval mortality was heavy, the number of adults decreased, and the malaria cases in the hospital dropped to nearly zero.

CAMMANN, T. (566)
USE OF AEROPLANES FOR LOCUST CAMPAIGN. Philippine Sugar Assoc. Rpts. 1931/1932: 41–43. Manila, 1933. 65.9 P53C

The writer, an airplane pilot, considers airplane dusting of the hoppers unnecessary and dangerous in cultivated areas, but recommends it for mountain breeding places. Does not recommend its use against adults because best results can be obtained through the campaign to have the people catch and eat them.

DE VILBISS, L. A. (567)
WINGS OF DEATH. Hygeia [Chicago] 11 (10): 902–903, 956, illus. October 1933. 449.8 H993

Investigations of the possibility of airplanes carrying dangerous mosquitoes. Inspection work at Miami, Fla.

DUFF, D. (568)
YELLOW FEVER CONTROL IN THE GOLD COAST AND THE PRESENT SITUATION. League of Nations Health Organ. Quart. Bul. 2 (1): 41–50. March 1933. 449.8 L47

Includes brief discussion of air-transport problem and of mosquito control in aircraft.

DU TOIT, P. J. (569)
TRANSMISSION OF ANIMAL DISEASES BY AEROPLANES. League of Nations Health Organ. Quart. Bul. 2 (1): 113–115. March 1933. 449.8 L47

Also *in* Indian Jour. Vet. Sci. and Anim. Husb. 3 (3): 291–293. September 1933. 41.8 In22

Ticks represent the greatest menace. The vectors of East Coast fever and Nairobi disease of sheep could be easily brought from Africa on the clothing or luggage of passengers.

EIDMANN, H. (570)
DIE FLUGZEUGBESTAÜBUNG DER FORSTSCHÄDLINGE UND IHRE ORGANISATION IM LICHTE NEUZEITLICHER ERFAHRUNG UND FORSCHUNG. Ztschr. f. Forst- u. Jagdw. 65 (1): 24–48. January 1933; 65 (2): 65–82, illus. February 1933. 99.8 Z3

Airplane dusting has developed along two lines: improvements in machinery and development of contact poisons. At present, three poisons can be used against smooth-skinned caterpillars only. The most important factor in success is still the weather. Although costs remain constant, better materials have increased the efficiency to 95 percent. Describes an automatic recorder for counting insect populations before, during, and after dusting.

References, pp. 81–82.

GREAT BRITAIN. ECONOMIC ADVISORY COUNCIL. COMMITTEE ON LOCUST CONTROL. (571)
THE LOCUST OUTBREAK IN AFRICA AND WESTERN ASIA, 1925-31. 87 pp., illus. London, H. M. Stationery Off., 1933. 429 G79L

Survey prepared by B. P. Uvarov.

Advises that control measures be directed against the adults, and recommends use of the airplane, pp. 56–57.

GRIFFITTS, T. H. D. (572)
AIR TRAFFIC IN RELATION TO PUBLIC HEALTH. Amer. Jour. Trop. Med. 13 (3): 283–290. May 1933. 448.8 Am33

Further experiments in the transportation of stained individuals of *Aedes aegypti*. Before 12 planes left San Salvador, 840 stained *Aedes* were liberated into all compartments. Eight percent were recovered at Brownsville, Tex., 30 hr. later. The maximum elevation they survived was 14,000 ft. Of 70 specimens liberated in a plane at San Salvador, 4 were recovered 79 hr. later at Miami, Fla. The plane had made 10 stops, 3 overnight. Although these results warrant precautions against the vectors of yellow fever and dengue, the author believes that infected persons still represent the greatest source of danger.

HERBERT, F. B. (573)
AIRPLANE LIQUID SPRAYING. Jour. Econ. Ent. 26 (6): 1052–1056, illus. December 1933. 421 J822

Reviews the development of liquid spraying with miscible oils by the Hawke Crop Dusting Company and the Independent Crop Dusting Company. The rotors spray the oil by centrifugal action and can throw out from 5 to 100 gal. per min. The spray or fine fog spreads laterally 40 to 75 ft. from the center of the plane and is distributed evenly at about 2 to 15 gal. per acre. The cost varies from 25 to 30 cents per gal. Tests were made over orchards, vineyards, and truck gardens. A table lists the pests treated, host plants, acres covered, materials used, and gal. per acre. Reports successful preliminary work against *Thrips tabaci*.

IVANOV, V. (574)
SAMOLET NA KHLOPKE [THE AIRPLANE IN THE COTTON FIELDS]. Grazhdan. Aviat͡sii͡a 3 (12): 17–20. December 1933. [In Russian.] Libr. Cong.

The 1933 meteorological conditions in Central Asia delayed the appearance of *Epitetranychus althaeae* in the cotton fields until the end of July. This late attack caused MIS (mechanized extermination stations of OBV) to underestimate the attack, and then make a sudden demand for two or three planes. The hazards of low flying in cotton dusting demand close cooperation between the ground and air crews. Sulfur and slaked lime dust is an effective poison at 30° C. and over, while below 30° C. it merely acts as a repellent. Because of the location of the mite, it must be applied in such a manner as to cover both sides of the leaf. Operations in the Fergansk Valley are also described: 5,000 ha. of cotton were dusted in spite of difficulties from sabotage.

KOROTKIKH, G. I. (575)
S.-KH AVIAT͡SII͡A ZA 10 LET [TEN YEARS OF AGRICULTURAL AVIATION]. Samolet 10 (2/3): 19. February/March 1933. [In Russian.] Libr. Cong.

Historical review of the use of the airplane in pest control from the first experiment in 1922 up to the outstanding achievements of 1932. Tables show amounts of dusting materials used per year, and the number of hectares treated for various pests. The advantages of the airplane method were especially marked during 1930–32, the period of reorganization and mechanization of agriculture.

*——— and ROSSEL'S, E. (576)
SAMOLETU NA SELE KOMSOMOL'SKUI͡U VSTRECHU (BOR'BA S VREDITELIAMI) [COMMUNIST YOUTH WELCOMES THE AIRPLANE (PEST CONTROL)]. 16 pp. Moskva, Izd. T͡Sent. Tekhpropa SKHA i T͡Sent. Molodezh. S.-KH. Sta. T͡SK VLKSM, 1933. [In Russian.]

Aviation applied to agriculture.

KRIEG, H. (577)
ERFAHRUNGEN BEI DER LETZTEN BEKÄMPFUNG DER FORLEULE. Forstarchiv 9 (17): 275–276, illus. September 1933. 99.8 F7723

In 1932 both airplanes and power dusters were used against *Panolis flammea* at Neuendorf near Potsdam. About 1,000 tons of contact insecticides were distributed over 50,000 acres of forest. Each plane covered at least 250 acres a day. The larval mortality was 98 to 100 percent except in a few instances.

MCMULLEN. (578)
OBSERVATIONS ET EXPÉRIENCES NOUVELLES SUR LE TRANSPORT DES MOUSTIQUES PAR LES AÉROPLANES. Off. Internatl. d'Hyg. Pub. Paris. Bul. Mens. 25 (6): 1024–1027. June 1933. 449.75 Of2

Discusses work done by T. H. D. Griffitts and J. J. Griffitts. Marked specimens of *Aedes aegypti* survived during voyages of from 1 to 4 days. It is believed that regular and thorough spraying with pyrethrum in oil will keep the planes free of mosquitoes.

MARCUS, B. A. (579)
DIE ENTWICKLUNG DER FORLEULE (PANOLIS FLAMMEA SCHIFF.) 1931 IM LORENZER REICHSWALD. Ztschr. f. Angew. Ent. 20 (2): 169–203, illus. July 1933. 421 Z36

Dusting was carried out early in June with arsenical and contact insecticides. Late in June the fungus *Empusa aulicae* wiped out practically all larvae, both in treated and untreated stands. This paper deals mainly with biological studies of *Panolis flammea*.

References, pp. 202–203.

MASSEY, A. (580)
EPIDEMIOLOGY IN RELATION TO AIR TRAVEL. 59 pp., 5 maps. London, H. K. Lewis & Co., Ltd., 1933. Army Med. Libr.

Aerial transportation of mosquitoes, pp. 5, 22–26, 33; Ridding aircraft of mosquitoes, pp. 45–46, 51–52.

MLODKOVSKIĬ, B. L. (581)
OB ORGANIZAT͡SII NOCHNYKH POLETOV V SEL'KHOZAVIAT͡SII [ON ORGANIZING NIGHT FLIGHTS IN AGRICULTURAL AVIATION]. Grazhdan. Aviat͡siia 3 (12): 21–22. December 1933. [In Russian.] Libr. Cong.

Discusses advantages and difficulties of night work, including reference to Novoselov's suggested methods. In 1933 they were still considered premature, but in 1934 night work in pest control will be within the range of possibility. The Research Institute of GVF (Grazhdanskiĭ Vozdushnyĭ Flot) is to work on the special equipment necessary for this type of work.

MORIN, H. G. S., and MARTIN, P. (582)
POSSIBILITÉS D'UTILISATION PRATIQUE DU VERT DE PARIS EN INDOCHINE. Insts. Pasteur d'Indochine, Arch. No. 17, pp. 103–140, illus. April 1933. 448.39 In2

Includes experiments in airplane dusting against anopheline larvae. Paris green was diluted with road dust (7 parts of paris green to 93 parts of road dust). It should be mixed only a short time before using to avoid effect of damp atmosphere, and the dilution should be varied according to results obtained in the tests. Author found a rate of 8 oz. of paris green in a 7 percent mixture to 2½ acres satisfactory. The plane should fly slowly and at about 100 ft. and cover a width of 220 yd. at a time. Glass plates coated with vaseline were used to check uniformity of distribution and concentration of paris green.

NABOKOV, V. A. (583)
DAL'NEĬSHIE ETAPY ORGANIZAT͡SII AVIAKHIMICHESKOĬ BOR'BY S LICHINKAMI MALIT͡SIRIĬNOGO KOMARA [FURTHER STAGES IN THE ORGANIZATION OF AVIOCHEMICAL CONTROL OF THE LARVAE OF THE MALARIAL MOSQUITO]. Med. Parazitol. i Parazitar. Bolezni 2 (1/2): [32]–37. 1933. [In Russian.] Libr. Cong.

Discusses plans for 1933 control work and suggests the following improvements in organizational practices: (1) comprehensive plans for the training of operators; (2) statistical studies of acreage covered and amounts of chemicals used in dusting them; (3) checking on the regulation of the duster; (4) use of airplane photography in aviochemical dusting.

——— GORT͡SAINOV, A. A., and BEKMAN, A. M. (584)
ARSMAL' (ARSENIT MEDI)—NOVYĬ PREPARAT DLIT͡SA BOR'BY S LICHINKAMI MALIT͡SIRIĬNOGO KOMARA [COPPER ARSENITE, A NEW PREPARATION FOR THE CONTROL OF ANOPHELES LARVAE]. Med. Parazitol. i Parazitar. Bolezni 2 (1/2): 59–65. 1933. [In Russian.] Libr. Cong.

Includes tests made in dusting by airplane against anopheline mosquitoes. The width of the copper arsenite dust cloud released equaled that of paris green. When mixed with peat dust (1:1), it remained suspended for a long time and was evenly distributed. The material did not absorb water or remain in the dusting apparatus, and there was no clogging.

NOVOSELOV, M. (585)
VNIMANIE PRIMENENIIŪ SAMOLETA V SEL'SKOM KHOZIAĬSTVE [IN REGARD TO THE USE OF THE AIRPLANE IN AGRICULTURE]. Grazhdan. Aviatsiia 3 (1): 23. January 1933. [In Russian.] Libr. Cong.

Refers to pilot's difficulties in observing areas treated, and suggests reconstruction of plane with special regard to this problem.

OPENOV. (586)
RABOTA S.-KH. AVIATSII NA SEVERNOM KAVKAZE [AGRICULTURAL AVIATION WORK IN THE NORTH CAUCASUS]. Na Zashch. Sotsialist. Urozhaia 1933 No. 9, p. [40]. September 1933. [In Russian.] Libr. Cong.

Refers to work against Asiatic locust (*Locusta migratoria*), meadow moth (*Loxostege sticticalis*), and other pests. Paris green and calcium arsenite effected a mortality of 95 to 100 percent with no injury to the plants.

PFEFFER, A. (587)
KATASTROFÁLNÍ VÝSKYT SOSNOKAZE (PANOLIS FLAMMEA SCHIFF.) V ZÁPADNÍM SLOVENSKU A OBRANA PROTI NĚMU [INVASION OF PANOLIS FLAMMEA IN WESTERN CZECHOSLOVAKIA. BIOLOGY, METHODS OF CONTROL, ETC.]. Czechoslovakia. Min. Zeměděl. Sborn., v. 116, No. 2, 54 pp., illus. Praha, 1933. [In Czech. French and German summaries, pp. 46–52.] 19.5 C99S

In 1932, 1,800 acres were dusted with calcium arsenate and 3,750 acres with proprietary contact insecticides. Although more expensive, the latter proved far more efficient. Young larvae were killed in about 2 hours and 4th- or 5th-instar larvae in 24 hours. In several cases the mortality was 100 percent. Dusting was done between 5 and 7 a. m. or 6 and 8 p. m., 15 to 17 acres at a time. Five cwt. of dust was applied per plot. There was no damage to trees, birds, mammals, or beneficial insects.

References, pp. 53–54.

PLANK, H. K. (588)
DAMAGE CAUSED BY BEAN WORMS AND SOME IMPORTANT PROBLEMS CONNECTED WITH THEIR CONTROL. Calif. Dept. Agr. Bul. 22 (7/11): 366–378, illus. July/November 1933. 2 C12M

Seven spp. of Lepidoptera seriously injured beans in northern California during September and October of 1932. Dusts composed of varying proportions of lead arsenate, calcium arsenate, sulfur, and hydrated lime were applied, some of them from airplanes. The calcium and sulfur caused considerable burning of the leaves, and the arsenical residues are dangerous to stock. Barium fluosilicate, and possibly cryolite, are the only materials considered safe to use on beans. Both can be used at the rate of 8 lb. of dry material per acre, either alone or mixed with a carrier. The dust should be applied when the larvae are small.

POSHEMANSKIĬ, M. B. (589)
SEL'KHOZAVIATSIIA SSSR K XVI GODOVSHCHINE OKTIABRIA [AGRICULTURAL AVIATION ON THE 16TH ANNIVERSARY OF OCTOBER (REVOLUTION)]. Grazhdan. Aviatsiia 3 (10): 10–16. October 1933. [In Russian.] Libr. Cong.

Gives historical review of 9 years of agricultural aviation activities, and cites achievements in pest control since the first aviochemical expedition in 1925. States that by 1931 Agricultural Aviation was the outstanding organization in its field in the world. Outlines advantages of the use of the airplane in pest control

PRENDEL', A. P., and others. (590)
PRIMENENIE AVIAKHIMMETODA (AKHM) V PROTIVOMALIARIĬNOĬ BOR'BE V 1932 G. I-III [APPLICATION OF THE AVIOCHEMICAL METHOD (AKHM) IN ANTIMALARIAL CONTROL IN THE YEAR 1932. I-III]. Med. Parazitol. i Parazitar. Bolezni 2 (1/2): 37–53. 1933. [In Russian.] Libr. Cong.

Contents: I. AKHM v Dneprovskikh Plavniakh [AKHM in the Dnepr Reed Beds], by A. P. Prendel', pp. 37–41; II. AKHM v TSentral'noĭ Chernozemnoi Oblasti [AKHM in the Central Black-Earth Region], by V. G. Budylin, pp. 41–46; III. AKHM v Raĭone Promyshlennykh TSentrov Gor'kovskogo Kraia [AKHM in the Industrial Centers of the Gor'kiĭ Region], by S. A. Troitskiĭ, pp. 46–53.

Part I describes work of the first Ukrainian aviochemical expedition over

42,000 ha. of Dnepr reed beds between June 1 and Sept. 18, 1932. The use of airplane photography in planning the work would have increased efficiency. Planes made 254 flights and distributed 17,689 kg. of poison (paris green and road dust or forest black-earth dust) at the rate of 0.4 to 0.5 kg. per ha. The mixture was prepared at the ratio of 0.4–0.5 kg. of paris green to 0.6–0.5 kg. of the carriers. The mortality of *Anopheles maculipennis* larvae was 92 to 100 percent and larval density dropped from 2.5–3.5 to 0.01–0.1.

Part II describes the work of airplane crews Nos. 30 and 35 of the Voronezh Agricultural and Forestry Aviation Station. A total of 920 ha. were dusted in 242 flights during 67 hr. and 8 min. flying time. Planes averaged 1 flight every 17 min.

Part III refers to work done along the river basins on the outskirts of the cities of Gorki, Dzerzhinsk, and Balakhna. Talc, tripoli, and peat dust were used as carriers for paris green in a ratio of 1:1. The opening of the dusting apparatus was set to discharge 1 kg. of dust per ha., and the area dusted was computed by the amount of material used. A load of 200 kg. covered an area of 200 ha. Work began in May and in many places continued until October. Ground dusting by hand apparatus was also used to complete the destruction of the 10 to 15 percent of larvae not killed by the airplane dusting.

RAFES, P. M. (591)

KAKIM TREBOVANIÍAM DOLZHEN UDOVLETVORÍAT' LETNO-TEKNICHESKIĬ SOSTAV SEL'KHOZAVIATSII [REQUIREMENTS WHICH THE FLYING TECHNICAL STAFF OF AGRICULTURAL AVIATION HAS TO MEET]. Grazhdan. Aviatsiía 3 (6): 6–9. June 1933. [In Russian.] Libr. Cong.

Describes various operations which call for specialized workers. Pilot not only must know how to fly and make 60 to 70 landings a day but should also know how to manipulate the hopper.

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VZAIMOOTNOSHENIÍA NAZEMNYKH OTRÍADOV S AVIORABOTNIKAMI [INTERRELATIONS OF GROUND CREWS AND AIRPLANE WORKERS]. Na Zashch. Sotsialist. Urozhaía 1933, No. 4, pp. [4]–5. April 1933. [In Russian.] Libr. Cong.

The purpose of the 1933 agreement between OBV and Agricultural Aviation is to assure cooperation and responsibility in control operations.

REKACH, V. N. (593)

PROBLEMA ZASHCHITY KHLOPCHATNIKA OT VREDITELEĬ I BOLEZNEĬ V ZSFSR VO VTOROĬ PÍATILETKE [THE PROBLEM OF PROTECTING COTTON FROM PESTS AND DISEASES IN ZSFSR (THE TRANSCAUCASIAN REPUBLICS) DURING THE SECOND FIVE-YEAR PLAN]. Zakavkazskiĭ Nauch. Issled. Khlopkov. Inst. Trud. 43: 373–428, illus. 1933. [In Russian.] 72.9 G15

Includes a discussion of the advantages of the airplane method of control.

SCOTT, R. R. (594)

THE YELLOW FEVER PROBLEM AS IT AFFECTS TANGANYIKA TERRITORY. League of Nations Health Organ. Quart. Bul. 2 (1): 53–57. March 1933. 449.8 L47

Discusses mosquito control in aircraft, and states that yellow fever is not likely to be conveyed by infected mosquitoes if reasonable control is maintained at airports.

STRAŇÁK, F., BAUDYŠ, E., PALÁSEK, VIELWERTH, V., SEDA, A., KALANDRA, A., PFEFFER, A., and MAGERSTEIN, C. (595)

ZPRÁVA O VÝZNAČNÝCH ŠKODLIVÝCH ČINITELÍCH KULTURNÍCH ROSTLIN V ČESKOSLOVENSKÉ REPUBLICE VE VEGETAČNÍM OBDOBÍ 1931–1932 [REPORT ON IMPORTANT ADVERSE FACTORS AFFECTING CULTIVATED PLANTS IN THE REPUBLIC OF CZECHOSLOVAKIA IN THE CROP YEAR 1931–32]. Ochrana Rostlin 13 (1/2): 7–56, illus. 1933. [In Czech.] 464.8 Oc3

A. Pfeffer, in the section on forest pests, discusses airplane dusting against *Panolis flammea*. Tests were made over about 5,500 acres, and good results were obtained with the contact dust, Forestit. Arsenical dusts were less effective.

TRAUT, I. [I.] (596)

SAMOLETY NA ZASCHITU UROZHAÎA V KAZAKHSTANE [AIRPLANES FOR THE PROTECTION OF CROPS IN KAZAKHSTAN]. Na Zashch. Sotsialist. Urozhaîa 1933, No. 9, pp. [38]–39. September 1933. [In Russian.] Libr. Cong.

Analysis of work in various regions of Kazakhstan in 1933 against locusts and spider mites (*Tetranychus* spp.). Calcium arsenite, at the rate of 2½ kg. per ha., was used against the Moroccan locust (*Dociostaurus maroccanus*) and 3 kg. per ha. against Asiatic locust (*Locusta migratoria*). Dust was applied to 134,000 ha., and bait to 51,000. Although the results were better than in previous years, many difficulties could have been avoided by greater cooperation between the flight crew and OBV workers.

TRAVIS, B. V., and DECKER, G. C. (597)

A STUDY ON THE USE OF ARSENICAL DUST FOR THE CONTROL OF JUNE BEETLES. Iowa State Col. Jour. Sci. 7 (4): 493–498, illus. July 1933. 470 Io9

A local plane was hired by members of the Hampton, Iowa, Country Club to carry on dusting experiments against *Phyllophaga* defoliating oaks. The dust was too lightly applied on the first trip and on the second severe damage to the plane caused the work to be discontinued. Nevertheless, the results decided the authors to conduct laboratory tests on the value of calcium arsenate against the beetles. Moderate and heavy applications killed 65 to 100 percent in less than 72 hr.

ZAKHAROV, D. (598)

ORGANIZATSIIA RABOT PO BOR'BE S SARANCHEVYMI [ORGANIZING THE WORK ON LOCUST CONTROL]. Na Zashch. Sotsialist. Urozhaîa 1933, No. 4, pp. 18, [20]. April 1933. [In Russian.] Libr. Cong.

Describes control in various sections of North Caucasus, and points out that the aviochemical method can achieve most successful results only in conjunction with supplementary methods. There were many defects in organizing the operations, such as: (1) Inaccurate investigation of foci; (2) late beginning of operations; (3) insufficient ground force, irresponsibility of workers, and lack of initiative; (4) lack of inspection; (5) lack of observation of the movement of the swarms and poor signaling during operations; (6) poorly trained technical personnel. All these defects can be eliminated by raising the qualifications of the workers.

ZARZAR, V. (599)

GRAZHDANSKIĬ VOZDUSHNYĬ FLOT—ODIN IZ RYCHAGOV REKONSTRUKTSII NARODNOGO KHOZÎAĬSTVA SSSR [CIVIL AIR FORCE—ONE OF THE LEVERS FOR RECONSTRUCTION OF THE NATIONAL ECONOMY OF THE U. S. S. R.]. Grazhdan. Aviatsiîa 3 (2): 10–13. February 1933. [In Russian.] Libr. Cong.

Outlines the development of GVF in the U. S. S. R. during the first 10 yr. of its existence and its outstanding contribution to the various fields of agriculture, including pest control.

ZHUKOV, N. M., SERGIEV, P. G., KRASIKOVA, V. I., KRUGLOVA, A. M., and VISHNEVSKAÎA, E. P. (600)

PROBLEMA LIKVIDATSII MALÎARII V SVÎAZI S PROBLEMOĬ BOL'SHOĬ VOLGI [PROBLEM OF MALARIA ERADICATION IN RELATION TO THE PROBLEM OF THE GREAT VOLGA]. Med. Parazitol. i Parazitar. Bolezni 2 (1/2): 14–31. 1933. [In Russian.] Libr. Cong.

Includes discussion of the aviochemical method. Provision of dust-supply bases near the area to be dusted and an increase in carrying capacity of the planes would save much time otherwise lost in refilling. Planes which can fly at a slow rate of speed are more effective along winding shores. One plane with a half-ton load of paris green can dust an area of 1,000 ha.

1934

ANONYMOUS. (601)

LUCHSHIE LÎUDI GVF. DESÎAT' LET RABOTY V GRAZHDANSKOM VOZDUSHNOM FLOTE [THE OUTSTANDING PERSONNEL OF THE CIVIL AIR FORCE. TEN YEARS WORK IN THE CIVIL AIR FORCE]. Grazhdan. Aviatsiîa 4 (8): 23–27. August 1934. [In Russian.] Libr. Cong.

Short biographical sketches with portraits of A. K. Anders, G. I. Korotkikh, and other distinguished aviators and technicians.

ADAMS, C. S. (602)
DUST CITRUS GROVE FROM AIRPLANE. Fla. Grower 42 (4): 11. May 1934.
80 F6622

Reports on a successful dusting test in the tangerine orchard of Dr. P. Phillips at Sand Lake. Plane was furnished by the Delta Air Service.

ALDRICH, J. M. (603)
INSECTS AND AIRPLANES. Jour. Econ. Ent. 27 (1): 239. February 1934.
421 J822

In Utah the salt water gnat, *Ephydra gracilis*, caused an Army transport plane to make a forced landing. So many insects were sucked into the air intake screen on the carburetor that the motor slowed to 900 r. p. m.

ANDERS, A. K. (604)
SEL'SKOKHOZÍÂÏSTVENNAÍÂ AVIATSIÍÂ VO VTOROÏ PÍÂTILETKE [AGRICULTURAL AVIATION IN THE SECOND FIVE-YEAR PLAN]. Grazhdan. Aviatsiíâ 4 (3): 15–18. March 1934. [In Russian.] Libr. Cong.

Discusses progress made and problems to be solved. A shortage of insecticides compels the limitation of operations to work on the major pests of the most important crops. The expansion in the work in spite of handicaps is explained by the inclusion of new areas in the plan and by the increase in popular interest.

ARGENTINA. MINISTERIO DE AGRICULTURA. COMISIÓN CENTRAL DE INVESTIGACIONES SOBRE LA LANGOSTA. (605)
INFORMES DE LAS COMISIONES EXPLORADORAS. MAYO À AGOSTO DE 1933. 207 pp., illus. Buenos Aires, 1934. 429 Ar35

Partial contents: Informe de la Comisión Exploradora No. 2, by P. Köhler, pp. [67–97].—Discusses work in Salta and Formosa (northeastern Argentina). Recommends use of the airplane for scouting and control work over uninhabited or inaccessible land. Swarms in flight should be dusted with sodium arsenite.

BEHRNDT, G. (606)
DIE BEKÄMPFUNG DER FORLEULE PANOLIS FLAMMEA IM JAHRE 1933 IN DEN PRIVAT- UND KOMMUNALWALDUNGEN PREUSSENS UND MECKLENBURGS. Mitt. aus Forstw. u. Forstwiss. 5 (1): 193–211, illus. 1934. 99.9 P952

Dusting over extensive areas was done by both airplanes and power dusters. The motor dusting proved very effective. There were no new developments in the technique and organization of the airplane method. The planes used were: Junker, Fokker, L. V. G. machines, Albatros-Doppeldecker, and Messerschmitt. The contact dusts Neurotol, Forestit, Verindal, Hestha, and Derosil were tested. The airplanes should not be stationed in damp places or the insecticides kept in paper bags. A system of red, yellow, and white flags is advised for signaling.

BERLAND, L. (607)
ÉTUDE EN AVION DE LA FAUNE ENTOMOLOGIQUE AÉRIENNE. [Paris] Acad. des Sci. Compt. Rend. 198 (25): 2201–2203. June 18, 1934. 505 P21

Flights were made at Saint-Cyr and Toussus-le-Noble using a net of silk bolting cloth attached to the wing. Stability of the plane was not affected. The catch included aphids, thrips, chalcids, braconids, and ephydrids. These small, weak-flying insects had probably been carried up by the wind or ascending air currents. Concludes from numbers taken that insects must be present in large numbers, and suggests use of the term "aeroplankton" for this fauna.

——— (608)
RECHERCHES EN AVION SUR LA FAUNE DE L'ATMOSPHÈRE. Nature [Paris] 62: 341–345, illus. Oct. 15, 1934. Natl. Bur. Standards Libr.

Description and illustration of collecting net and method of attachment to plane. For results of flights *see* item 607.

COLLINS, C. W., and BAKER, W. L. (609)
EXPLORING THE UPPER AIR FOR WIND-BORNE GIPSY MOTH LARVAE. Jour. Econ. Ent. 27 (2): 320–327, illus. April 1934. 421 J822

Experiments were made in 1932 and 1933 over an area in Massachuestts heavily infested with *Porthetria dispar*. A trap fastened to an airplane was

used. Four 1st-stage larvae were captured (1 between 300 and 500 ft., 2 at 1,000 ft., and 1 at 2,000 ft. above sea level). Considering the small part of the enormous volume of cubic air above the forests which was sampled, it is evident that there would be little chance of capturing any larvae at all unless a multitude were afloat in the air at the time. Describes and illustrates a new type of airplane trap developed by K. O. Lange.

De Gryse, J. J., and Schedl, K. (610)
AN ACCOUNT OF THE EASTERN HEMLOCK LOOPER, ELLOPIA [I. E. LAMBDINA] FISCELLARIA GN., ON HEMLOCK, WITH NOTES ON ALLIED SPECIES. Sci. Agr. 14 (10): 523–539, illus. June 1934. 7 Sci2

When hundreds of acres are involved, airplane dusting is the only practical method of control. Recounts experiments in the Muskoka Lakes area. In July, 1928 calcium arsenate was used, 35 lb. per acre. The larvae were too far developed and only a 37 percent mortality was reached. On June 19, 1929 operations were started over 1,000 acres of forest. The plane used was a De Haviland 61 equipped with a Jupiter 500-hp. motor. The hopper had a capacity of 1,400 lb. Undiluted calcium arsenate (40 percent arsenic oxide) was used. In this region better results were obtained during the evening hours. About 30 lb. of poison were distributed per acre. When the dust remained undisturbed for 24 hr., the larval mortality was from 90 to 100 percent. Use was made of aerial maps and photographs in planning the work.

Delcambre. (611)
L'EMPLOI DE L'AVION. Cong. de la Défense Sanit. des Vég., Paris, 1934, La Défense Sanit. des Vég., v. I. Compt. Rend. des Trav., pp. 371–379. 464.9 C765

Reviews the use of airplanes in pest control in various countries. In France it has been used only for control of forest insects. Suggests that this method be tested in the vineyards in France, and for the control of locusts in the colonial possessions.

Filin. (612)
VORONEZHSKIĬ SEL'KHOZAVIAOTRÎAD NA SLUZHBE SOTSIALISTICHESKOGO STROITEL'STVA [THE VORONEZH AGRICULTURAL AVIATION CREW IN THE SERVICE OF THE SOCIALIST STRUCTURE]. Grazhdan. Aviatsiîa 4 (8): 13–14. August 1934. [In Russian.] Libr. Cong.

Deals with the work of the Sel'khozaviaotrîad (agricultural aviation crew) against mosquitoes in Lipetsk and Voronezh. A larval mortality of 100 percent was obtained, and the number of malaria cases decreased. Work will be extended to other localities.

Gaines, R. C., and Isler, D. A. (613)
MACHINERY FOR DUSTING COTTON. U. S. Dept. Agr. Farmers' Bul. 1729, 14 pp., illus. Washington, D. C., 1934. 1 Ag84F

Airplane dusting, pp. 12–14.

Great Britain. Economic Advisory Council. Committee on Locust Control. (614)
REVIEW OF THE PRESENT LOCUST OUTBREAK IN AFRICA AND WESTERN ASIA AND OF THE INVESTIGATIONS CARRIED OUT SINCE 1929, AND A NOTE ON THE GENERAL PROGRAMME OF FURTHER INVESTIGATIONS. Gt. Brit. Econ. Advisory Council. Com. Locust Control. Rpt. 6, 55 pp. London, H. M. Stationery Off., 1934. 429 G79

Results of airplane-dusting tests are included. Experiments were made on the concentration of sodium arsenite required, on the nature of the dust cloud, and on the apparatus for discharging the dust.

Herbert, F. B. (615)
AIRPLANE VAPOR SPRAYING: A PROGRESS REPORT. Jour. Econ. Ent. 27 (5): 1040–1042, illus. October 1934. 421 J822

Gives data gathered in California during the treatment of several thousand acres of prunes, apricots, peaches, grapes, etc. with oil sprays against *Lecanium corni*, *Archips rosaceana*, and *Erythroneura comes*. Lead arsenate was added to the oil in the spring control of *Erythroneura comes* on grapes. When heavily foliaged vines were trellised, it was necessary to fly parallel to the

rows, not across them. Briefly describes equipment changes made during 1933/34 season. Under ideal weather conditions one plane was able to spray 2,650 gal. over 440 acres in one day. The same plane treated 1,000 acres of peaches in 2 days, 2 hr. Concludes that airplane application of oil sprays is fast, efficient, and economical.

——— (616)

OIL SPRAYING BY AIRPLANE. Pacific Rural Press 127 (7): 154. Feb. 17, 1934. 6 P112

Advantages of spraying fruits and vegetables by airplane.

HIMMER, A. (617)

UEBER DIE EINWIRKUNG ARSENHALTIGER STÄUBEMITTEL AUF DIE BIENEN. Deut. Gesell. f. Angew. Ent. Verhandl. (1933) 9: 94–103. 1934. 420 D48V

Arsenicals applied as dusts are extremely dangerous to bees. The author contends that the minimum lethal dose is 0.00011 to 0.0014 mg. Cites records of damage to bees in Germany. Airplane dusting is more harmful than ground dusting. The danger zone for the former extends to 6 miles, and for the latter it is 3 miles. If arsenical sprays are not applied to blossoms or to flowering undergrowth, they will not harm bees.

HOPPING, G. R. (618)

AN ACCOUNT OF THE WESTERN HEMLOCK LOOPER, ELLOPIA SOMNIARIA HULST [I. E. LAMBDINA FISCELLARIA SOMNIARIA (HULST)], ON CONIFERS IN BRITISH COLUMBIA. Sci. Agr. 15 (1): 12–29, illus. September 1934. 7 Sci2

Gives a brief résumé of the advantages and disadvantages of airplane dusting. The Wigwam Inn Project in 1929 was the first airplane-dusting experiment in British Columbia. The plane used was a Boeing flying boat with a 420-hp. Wasp motor. Calcium arsenate, diluted 1 part to 6 with hydrated lime, was dusted over 45 acres (26 lb. per acre). Total cost was $471.56. In the Stanley Park Project (spring 1930) the same model plane was used with a different type of hopper. Eight tons of dust were distributed over 800 acres, and gave a coverage of 18 to 20 lb. per acre. The larval mortality was 75 to 80 percent. The total cost was $6,394. In June the Seymour Park Project gave a mortality of 80 to 85 percent. The Western Canada Airways applied the dust under contract for all operations, and very favorable weather conditions prevailed.

IVANOV, P. M. (619)

PUTI RAZVITIÍA GRAZHDANSKOĬ AVIATSII KAZAKHSTANA [DEVELOPMENT OF CIVIL AVIATION IN KAZAKHSTAN]. Grazhdan. Aviatsiía 4 (5): 10–11. May 1934. [In Russian.] Libr. Cong.

Describes transformation of Kazakhstan from a backward colonial region into a flourishing agro-industrial socialist country; and refers to the use of planes in the aviochemical method of insect control, especially against the locust.

JAMES, S. P. (620)

RENSEIGNEMENTS SUR LA FIÈVRE JAUNE REÇUS PENDANT LES SIX MOIS SE TERMINANT AU 31 MARS 1934. Off. Internatl. d'Hyg. Pub. [Paris]. Bul. Mens. 26 (6): 1048–1056, illus. June 1934. 449.75 Of2

Includes references to studies by G. [i. e. C.] B. Symes of Kenya on airplane transport of mosquitoes. Thirty planes were examined at Nairobi and Kisumu. Anophelines were found in 18, *Culex* in 12, and there were a few tabanids. No specimens of *Aedes aegypti* were seen. In this part of Africa apparently no work has been done to control airplane disemination of insects.

JOHNSTON, F. A. (621)

AVIATION BRINGS FOREIGN PLANT PESTS AND MAKES QUARANTINES NECESSARY. U. S. Dept. Agr. Yearbook 1934: 142–144, illus. 1 Ag84Y

Stresses importance of intercepting plant pests and disease vectors.

KING, H. H. (622)

THE DESTRUCTION OF LOCUSTS IN FLIGHT BY MEANS OF A POISON DUST (SODIUM ARSENITE) DELIVERED FROM AIRCRAFT. Internatl. Locust Conf., London. Proc. (1934) 3: 97–110, illus. 429 In83

Describes experiments carried out against *Nomadacris septemfasciata* in Northern and Southern Rhodesia using a special apparatus attached to a

Hercules plane. Locusts in flight make no effort to avoid the dust cloud, which should be discharged as close to the front of the swarm as possible. Ten lb. of dust per sec. produce a cloud toxic for at least 3 min. to locusts flying through. The aircraft should be able to carry a load of at least 1,000 lb., and the discharge apparatus should be capable of ejecting either a continuous or an interrupted stream at a rate of 5 to 10 lb. per sec. A scouting plane is also needed. Additional notes are given on pp. 111–125 by the ground observers, W. Allen and J. K. Chorley.

KOROTKIKH, G. I. (623)

LIKVIDATSIIA SARANCHEVYKH GNEZDILISHCH V SSSR [EXTERMINATION OF LOCUST FOCI IN U. S. S. R.]. Grazhdan. Aviatsiia 4 (8): 10–11. August 1934. [In Russian.] Libr. Cong.

Reviews work on locust control from 1925 through 1934. During this period over a million hectares were cleared of locusts. This achievement is one of the great contributions of Soviet aviation to the building of the socialist structure.

——— (624)

NASHA S.-KH. AVIATSIIA PERVAIA V MIRE [OUR AGRICULTURAL AVIATION IS FIRST IN THE WORLD]. Na Zashch. Sotsialist. Urozhaia 1934. No. 1, pp. 11–12, illus. January 1934. [In Russian.] Libr. Cong.

Describes the progress made in the development of the aviochemical method. Completion of the 5-yr. plan in 3 yrs. is shown in comparative tables on pest control. The plan of the Agricultural Aviation Trust for 1934 includes the treatment of 2,800,000 ha.

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SAMOLET V PROTIVOSARANCHEVOĬ KAMPANII 1934 G. [THE AIRPLANE IN THE LOCUST CONTROL CAMPAIGN OF 1934]. Na Zashch. Sotsialist. Urozhaia 1934, No. 11, pp. [18]–[20]. November 1934. [In Russian.] Libr. Cong.

Describes airplane dusting in the republics of Central Asia and adjacent regions, results of which were below the plan for the year. Main reason for not fulfilling the plan was the scarcity of locusts. Tadzhikistan planned to dust 115,000 ha., but only 62,000 have been worked on. This difference is explained by meteorological conditions as well as poor investigation of locust foci.

——— (626)

SAMOLET V SEL'SKOM KHOZIAĬSTVE [AIRPLANE IN AGRICULTURE]. Narod. Uchitel' 11 (3): 58–63. May/June 1934. [In Russian.] Libr. Cong. (Slavic Div.)

Reviews progress made since the first 5-yr. plan (1929–33 inclusive) and discusses the advantages of the aerial method.

——— (627)

VYSHE KACHESTVO AVIOMETODA NA PROTIVOSARANCHEVOM FRONTE [BETTER QUALITY IN THE AERIAL METHOD ON THE LOCUST FRONT]. Na Zashch. Sotsialist. Urozhaia 1934, No. 4, pp. 15–17. April 1934. [In Russian.] Libr. Cong.

Analysis of inefficiencies in airplane control during previous years. These are to be eliminated by correct organization of work and the application of socialist methods. Comparative tables show number of hectares dusted in various localities.

LAVROV, L. (628)

SAMOLET IMENI "NZU" VSTUPIL V STROĬ [AIRPLANE "NZU" IS UNDER CONSTRUCTION]. Na Zashch. Sotsialist. Urozhaia 1934, No. 11, pp. [20–22], illus. November 1934. [In Russian.] Libr. Cong.

Describes the dedication of an airplane to the periodical Na Zashchitu Urozhaia by its readers. A sum of 25,000 rubles was collected. The plane will be equipped with the new type of hopper, which will eliminate previous difficulties in dusting. Details of the hopper are given.

LEGENDRE, F. (629)
EXPÉRIENCES DE PROJECTION DE POUDRES LARVICIDES PAR AVIONS À MADAGASCAR. Soc. Path. Exot. Bul. 27 (6): 603–608. Apr. 10, 1934.
448.9 So13

Paris green was distributed by airplane to control breeding of *Anopheles* in the swamps and rice fields near the aviation camp at Ivato. The subsequent decrease in larval density justified the continued use of this method of control.

LEINEWEBER, H. (630)
EIN NEUES VERFAHREN ZUR AUSZEICHNUNG DER BESTÄUBUNGSQUARTIERE BEI DER FLUGZEUGBESTÄUBUNG. Mitt. aus Forstw. u. Forstwiss. 5 (1): 212–215. 1934. 99.9 P952

Describes the disadvantages of using flags for signaling in airplane dusting and advocates the use of balloons for marking areas to be dusted. Balloons were first used in the State Forest of Linichen in 1933. This new method is cheaper, safer, more time-saving, and easier for the pilot.

MOTE, D. C., and THOMPSON, B. G. (631)
RECENT RESEARCH IN INSECTICIDES: SUBSTITUTES FOR LEAD ARSENATE. Pacific Sci. Cong., 5, Canada, 1933. Proc. 5: 3411–3417. Toronto, 1934.
330.9 P194

A pyrethrum dust, applied 15 lb. per acre, was used successfully against *Diabrotica undecimpunctata* when the bean plants were about 4 ft. high with beans beginning to form. Airplane application proved most efficient, even over small plots, as the hand dusters always disturbed some of the beetles, causing them to fly ahead of the dust cloud. There were no culls from the dusted plot, while 7 of the 10 tons from the untreated check plot were culled.

NABOKOV, V. A. (632)
K ITOGAM PRIMENENIÎA AVIAKHIMICHESKOGO METODA BOR'BY S MALÎARIEÎ V 1933 GODU [RESULTS OF THE APPLICATION OF THE AVIOCHEMICAL METHOD IN THE CONTROL OF MALARIA IN 1933]. Med. Parazitol. i Parazitar. Bolezni 3 (1): 68–73, illus. 1934. [In Russian.] Army Med. Libr.

Points to defects in the organization of antimalaria work with anopheline larvicides in the U. S. S. R., and outlines a plan for an improved program. Discusses results of further experiments with the copper arsenite preparation Arsmal from June to the middle of September 1933, during which 23 tons of poison were released over 45,000 acres of peat bogs near Moscow. There was a sharp decrease in malaria incidence in spite of the fact that the material supplied by the factory was defective.

NAUDÉ, T. J. (633)
THE USE OF AEROPLANES IN LOCUST CONTROL. Internatl. Locust Conf., London, 1934. Proc. 3: 125–127. 429 In83

Report on experiments made in March 1934 against *Nomadacris septemfasciata* using a De Haviland 9 plane. Ten lb. of sodium arsenite dust per acre discharged from a height of 80 to 100 ft. gave heavy mortality in 48 hr. This dosage, however, is considered too heavy and dangerous to livestock. In the Union of South Africa preference is given to treating resting swarms rather than those in flight. The compactness of a resting swarm reduces the area treated, and the amount of poison needed can be easily carried by large aircraft.

NAUMOV, I. (634)
PODGOTOVKA K BOR'BE S SARANCHOVYMI—UDARNYE TEMPY [PREPARATION FOR LOCUST CONTROL—SCHOCK TEMPO]. Na Zashch. Sotsialist. Urozhaîa 1934, No. 3, pp. 9–11. March 1934. [In Russian.] Libr. Cong.

Points out the importance of avoiding the mistakes of 1933 by efficient preparatory work. This is of vital importance since the plan for 1934 calls for treatment of 2,400,000 ha., of which 500,000 ha. are to be dusted.

NEVSKIĬ, V. P., ed. (635)
SARANCHEVYE SREDNEĬ ASII [LOCUSTS OF CENTRAL ASIA]. 243 pp. Moskva, Ob"edinenie Gosudarstvennykh Izdatel. Sredneaziatskoe Otd., 1934. [In Russian.] 429 N412

At head of title: Sredne-Aziatskiĭ Nauchno-Issledovatel'skiĭ Institut Zashchity Rastenii [Central Asiatic Inst. Plant Protect.].

Partial contents: Sistema Meropriiâtiĭ po Bor'be s Marokkskoĭ Kobylkoĭ v Sredneĭ Azii [A System of Control Measures against the Moroccan Locust in Central Asia], by E. N. Ivanov, pp. 220–224.

Although the aviochemical method is the most effective for control of *Dociostaurus maroccanus* and the protection of crops, yet 100-percent mortality has not been achieved. Socialist agriculture cannot be satisfied with partial and temporary successes, but must accomplish complete eradication of locusts by supplementary measures. Discusses essential additional means of control.

PANTELEEV, A., NAUMOV, I., VOSKRESENSKIĬ, P., and PASTUKHOV, B. (636)
PERVYE ITOGI [FIRST RESULTS]. Na Zashch. Sot͡sialist. Urozhaĭâ 1934, No. 8, pp. [8]–[12]. August 1934. [In Russian.] Libr. Cong.

Describes results obtained in the control of various pests. In Uzbekistan and Tadzhikistan successful control of *Dociostaurus maroccanus* was achieved, while in other regions of Central Asia the inefficient practices of the previous year have been repeated.

Includes a table showing the work done in the different republics and adjacent regions.

POSHEMANSKIĬ, M. [B.] (637)
AVIAT͡SIĬÂ SOT͡SIALISTICHESKOGO SEL'SKOGO KHOZĬÂĬSTVA [AVIATION IN SOCIALIST AGRICULTURE]. Samolet 11 (2): 28–29, 33. February 1934. [In Russian.] Libr. Cong.

Refers to the complex operations in airplane dusting where the skill and heroism of pilots is demonstrated in flights at 3 to 7 m. above the ground. In 1933 the area treated against agricultural and forest pests amounted to 415,707 ha. In addition, 741,326 ha. were dusted for the control of mosquito larvae.

——— (638)
VYSHE ZNAMIÂ BOR'BY ZA KACHESTVO RABOTY [RAISE THE BANNER HIGHER IN THE FIGHT FOR BETTER WORK]! Grazhdan. Aviat͡siiâ 4 (1): 8–12. January 1934. [In Russian.] Libr. Cong.

Although Sel'khozaviat͡siiâ (Agricultural Aviation) made an outstanding record in 1931, its record for 1932 (first year of second 5-yr. plan) was low. Since the Government attributed this to inefficient management and lack of party activity, it issued a decree in May to improve the work. Sel'khozaviat͡siiâ reported at the 17th Congress in November that they had fulfilled, even exceeded, the plan in most assignments; but in pest control, in spite of increased use of each plane and a 30-percent decrease in cost per flight-hr., results were not up to standard set. Only 85 percent of the work planned for 1933 had been accomplished in crop pest control, and 72 percent in malaria control. The lag in the former is ascribed to conservatism, and in the latter to a lack of insecticides. The quality of the work accomplished is reported excellent, and again proves the value of the airplane method.

RADZIEVSKAIÂ, S. B., SERBINOV, V. I., and T͡SYGANKOV, S. K. (639)
VREDITELI I BOLEZNI KHLOPCHATNIKA [PESTS AND DISEASES OF COTTON]. 188 [3] pp. illus. Moskva, Ob"edinenie Gosudarstvennykh Izdatel. Srednеaziatskoe Otd., 1934. [In Russian.] 464.042 R11

At head of title: Sredne-Aziatskiĭ Nauchno-Issledovatel'skiĭ Khlopkovyĭ Institut (NIKHI) [Central Asiatic Cotton Research Institute].

Control measures include dusting from airplanes.

SAKHAROV, N. L. (640)
VREDITELI GORCHIT͡SY I BOR'BA S NIMI [PESTS OF MUSTARD]. 120 pp., illus. Saratov, Kraevoe Gosudarstvennoe Izd., 1934. [In Russian. German summary, p. 115.] 423 Sa22

At head of title: Vsesoîuznyĭ Institut Zernovogo Khozîaistva [Institute of Grain Farming in U. S. S. R.].

Calcium arsenate was found most effective against all chewing insects, and in 1931 was successfully applied by airplane.

SCHWERDTFEGER, F. (641)
DIE BEKÄMPFUNG DER FORLEULENKALAMITÄT 1933 IN DEN PREUSSISCHEN STAATSFORSTEN. Mitt. aus Forstw. u. Forstwiss. 5 (1): 185–192. 1934. 99.9 P952

Airplanes dusted about 2,200 acres, using the "zebra" technique, i. e., the usual number of flights was cut in half and spaced twice as far apart. This system of moderate dusting is based on the theory that if 70 percent of the larvae are killed, the rest will be controlled by tachinid parasites. The insecticide used must not harm the parasites, and must be applied when the pine moth, *Panolis flammea*, larvae are young. The tachinids must be present in adequate numbers and the pines must have enough needles to survive the injury which may appear on undusted strips. A total of about 24,000 acres was treated. Power dusters proved effective on areas as large as 5,000 acres and could be used when wind conditions made the use of airplanes impracticable.

SINTON, J. A. (642)
SUGGESTIONS WITH REGARD TO THE PREVENTION OF THE SPREAD OF YELLOW FEVER TO INDIA BY AIR TRAFFIC, WITH SPECIAL REFERENCE TO INSECT TRANSMISSION. India. Med. Dept. Health Bul. 20, 34 pp., illus. Delhi, 1934. 449.9 In22

Yellow fever could easily be introduced into India, where the vector, *Aedes aegypti*, is widely distributed. Reviews the literature on airplane transport of mosquitoes, and recommends various preventive measures for use at ports of embarkation, during flights, and at ports of entry. Outlines experiments to determine numbers of mosquitoes in upper air over India, relation of type of plane to insect transportation and methods of treating airplanes, passengers' luggage, etc.

SWAINE, J. M. (643)
CONTROL OF DEFOLIATING INSECTS IN FORESTS. Pacific Sci. Cong., 5, Canada, 1933. Proc. 5: 3387–3393. Toronto, 1934. 330.9 P194

Airplane dusting, pp. 3388–3390.

TRAPPMANN, W. (644)
FORLEULENBEKÄMPFUNG 1933 IN DEUTSCHLAND. Nachrichtenbl. f. den Deut. Pflanzenschutzdienst 14 (10): 98–99. October 1934. 464.9 N11

Summarizes the paper by Schwerdtfeger and a report by G. Behrndt on dusting pines in Prussian forests to control *Panolis flammea*. Both power and airplane equipment were used, and good results were obtained with contact poisons.

*UL'IANISHCHEV, V. I. (645)
OPYTY AVIABOR'BY S ÎABLONOVOĬ MOL'IU [EXPERIMENTS IN THE AVIOCHEMICAL CONTROL OF THE APPLE MOTH (HYPONOMEUTA PADELLA L.)]. Azerbaĭdzh. Plant Protect. Sta. Pub. 1934, pp. 8–56, illus. [In Russian. English summary.]

The Korotkikh and Rafes bibliography (p. iv) cites this on p. 51 as "Sbornik VNIISKHA," vyp. 1, pp. 8–56, 1934.

Tests were made in northeast Azerbaidzhan during 1931 and 1932. Materials used were calcium arsenate (sometimes alone, sometimes mixed with sulfur or sulfur and copper carbonate), and sodium fluosilicate. Details of application and resultant mortalities are given. Concludes that airplane dusting is as efficient as ground spraying.—Abstract *in* Rev. Appl. Ent., A 23: 58–59. 1935.

VEĬSMAN, A. (646)
VOZDUSHNYĬ FLOT V KAPITALISTICHESKOM I SOTSIALISTICHESKOM SEL'SKOM KHOZÎAĬSTVE [AIR FORCE IN CAPITALISTIC AND SOCIALISTIC AGRICULTURE]. Na Agrarnom Fronte 1934, No. 2/3, pp. 139–149. February/March 1934. [In Russian.] 281.8 N11

Discusses reasons which prevent the use of airplanes in agriculture in capitalistic countries. Under socialism in the U. S. S. R., aviation has been extended to various fields in agriculture. In malaria control, a plane can treat 300 ha. in one hr.; in locust extermination, 200 ha. Describes advantages of aircraft in agricultural work, with a comparison of the relative merits of the dirigible and the airplane.

WATSON, E. B. (647)
AN ACCOUNT OF THE EASTERN HEMLOCK LOOPER, ELLOPIA [I. E. LAMBDINA] FISCELLARIA GN., ON BALSAM FIR. Sci. Agr. 14 (12): 669–678, illus. August 1934. 7 Sci2

States that airplane dusting cannot yet be considered practicable over areas of 50 acres or more.

Y., H. W. (648)
AIRPLANE DUSTING IS UNIQUE AND PROFITABLE. Pop. Sci. Monthly 125 (5): 110–111. November 1934. 470 P81

Refers to work of Leslie M. Boyd, head of the Aero Agricultural Service Co.

1935

ALLEN, H. W. (649)
PLANES USEFUL TO AGRICULTURE. Natl. Repub. 22 (11): 12, illus. March 1935. 110 N212

Airplane transportation of parasites of the oriental fruit moth (*Grapholitha molesta*).

ATKEY, O. F. H. (650)
SUR LES MÉSURES QUI SERONT PRISES AU SOUDAN ANGLO-ÉGYPTIEN POUR RÉALISER DANS LES AÉRODROMES DE JUBA ET DE MALAKAL LES CONDITIONS REQUISES POUR LES AÉRODROMES ANTI-AMARILS. Off. Internatl. d'Hyg. Pub. [Paris] Bul. Mens. 27 (12): [2377]–2379. December 1935. 449.75 Of2

Describes conditions at the airports and outlines efforts to conform to international sanitary regulations, including protection from mosquitoes for the passengers, the luggage, and the personnel.

BECKWITH, C. S. (651)
DUSTING CRANBERRY BOGS FROM THE AIR. Amer. Cranberry Growers' Assoc. Proc. Ann. Conv. (1935) 66: 14–16. 81 Am53C

In the control of *Ophiola striatula*, pyrethrum was applied by various types of apparatus, including the airplane and the autogiro. A heavy pyrethrum dust deposited by airplane was effective, but better results were obtained with the pyrethrum dust and clay mixture when the autogiro was used. A kerosene-pyrethrum spray applied by autogiro showed great promise.

BERLAND, L. (652)
PREMIERS RÉSULTATS DE MES RECHERCHES EN AVION SUR LA FAUNE ET LA FLORE ATMOSPHÉRIQUES. Soc. Ent. de France. Ann. 104 (1): 73–96, illus. Mar. 31, 1935. 420 F84

Insects flying at heights from 3,000 to 7,000 ft. were captured by means of a net shaped like a truncated cone which was attached to an airplane. Describes, in detail, technique and methods used, and lists insects caught.

CAMPBELL, C. D., and MILLER, M. S. (653)
AVIATION IN SOVIET RUSSIA. Inst. of Transport [London]. Jour. 16 (7): 279–283. May 1935. Libr. Cong.

General survey including brief account of pest control by airplane.

DAVIS, P. O. (654)
PESTS FROM THE AIR. Rural Prog. Mag., v. B, No. 2, p. 17. February 1935. 6 R8817

Refers to importation of injurious insects by airplane.

DE VILLIERS, F. J. (655)
A METHOD FOR THE QUANTITATIVE DETERMINATION OF THE DISTRIBUTION OF LOCUST POISON. Inter-State Locust Conf., Pretoria. Rpt. of Proc. 1934: 66–67. 1935. 429 In84

Describes a technique for estimating density and uniformity of the powder distribution below the path of an airplane.

ECKERT, J. E. (656)
AIRPLANE DUSTING AND ITS RELATION TO BEEKEEPING. Amer. Bee Jour. 75 (2): 59–61, illus. February 1935. 424.8 Am3

Discusses arsenical drift, symptoms of bee poisoning, and remedial measures.

——— and ALLINGER, H. W. (657)
AIRPLANE DUSTING AND ITS RELATION TO BEEKEEPING. Jour. Econ. Ent. 28 (3): 590–597, illus. June 1935. 421 J822

In the Imperial Valley, Calif., 3,000 bee colonies have been killed by airplane-dusting practices in a 4-yr. period. The damage to the apiaries was caused by poisons that drifted to plants from which bees gathered pollen and nectar. Since bees poisoned by arsenic do not live to return to the hives, the honey is not affected. Pollen carried back by pollen carriers will endanger the nurse bees if stored in the combs. The larvae, left unattended, then die from exposure and starvation. Combs should be freed from poisoned pollen before they are used again. Clean cultivation keeps down certain weeds in dusted fields. As emergency measures, the entire colony can be moved or the bees confined during and after dusting.

FREEPORT SULPHUR COMPANY. (658)
AIRPLANE DUSTING. Brimstone Brevities, No. 2, pp. 17–18. December 1935. [Processed.] 309.8 B77

Sulfur dusts do not have the disadvantage—which arsenical poisons have—of killing bees or livestock, and they could be used to control rust in wheat fields. Further expansion of the use of airplanes will require a unified organization working under a contract system.

FRENCH, O. C. (659)
MECHANICAL EQUIPMENT FOR GRAPE LEAFHOPPER [ERYTHRONEURA COMES] CONTROL. Agr. Engin. 16 (6): 213–214, 217–218, illus. June 1935. 58.8 Ag83

Includes discussion of devices used by commercial airplane spraying companies for atomizing pyrethrum oil sprays.

HERBERT, F. B. (660)
SPRAYING FROM THE AIR. Pacific Rural Press 129 (8): 198. Feb. 23, 1935. 6 P112

Winter spraying of prune orchards with concentrated heavy soluble oils against Italian pear scale (*Epidiaspis piricola*), thrips, brown rot, and other diseases and pests.

HUNT, D. S. (661)
MORE ABOUT POTATO DUSTING IN FLORIDA. U. S. Air Services 20 (3): 20. March 1935. Libr. Cong.

Describes commercial work of Jack Faulkner and W. D. Thorne.

Note on this subject also *in* U. S. Air Services 20 (2): 38. February 1935. Libr. Cong.

IVANOV, V. (662)
NEKOTORYE VYVODY IZ OPYTA PROTIVOMALÎARIĬNYKH RABOT V SREDNEĬ AZII [SOME CONCLUSIONS FROM THE EXPERIMENTAL ANTIMALARIAL WORK IN CENTRAL ASIA]. Grazhdan. Aviatsîâ 5 (3): 41–44. March 1935. [In Russian.] Libr. Cong.

In Central Asia the malaria epidemics usually occur at the time when cotton is picked, and a serious labor shortage results. The airplane is helping in control work, its success depending on close cooperation between the tropical stations of Narkomzdrav and the aviators. Discusses the causes of operational errors and suggests improvements.

JITTA, J. (663)
SUR LA DESTRUCTION DES MOUSTIQUES À BORD DES AÉRONEFS D'APRÈS LES EXPÉRIENCES DES DRS. N. H. SWELLENGREBEL ET J. A. NYKAMP. Off. Internatl. d'Hyg. Pub. [Paris] Bul. Mens. 27 (7): 1360–1361. July 1935. 449.75 Of2

Recommends pyrethrum spray be tried in airplanes (petrol, 1 cm.^{3}; pyrethrum extract, 5 gm.; oil of sassafras, 5 cm.^{3}; methyl salicylate, 20 cm.^{3}). The amount required becomes relatively less as space increases. Recommends use of a compressed-air sprayer which will permit ejection of exact dosages and will produce a fine spray about 2 m. in length.

KIEFFER, D. L. (664)
CONDEMN AIRPLANE DUSTING. Pacific Rural Press 130 (22): 562. Nov. 30, 1935. 6 P112

California beekeepers and livestock raisers protest against injury from insecticidal poisoning. Suggests need for legislation to regulate careless dusting.

KOROTKIKH, G. I. (665)
AVIATSIIA NA SLUZHBE SEL'SKOGO I LESNOGO KHOZIAĬSTVA [AVIATION AT THE SERVICE OF AGRICULTURE AND FORESTRY]. Grazhdan. Vozd. Flot. K VII Vsesoiuzn. S'ezdu Sovetov 1935: 20–31, illus. Moskva, Glavnaia Redaktsiia Aviatsionnoĭ Literatury, 1935. [In Russian.] Libr. Cong.

Reviews progress made in the interval between the 6th and 7th Congresses of the Soviets, with a detailed account of the use of the airplane in pest control. The most urgent problem is the development of new insecticides. Comparative tables show increase in work against locusts, cotton insects, and mosquitoes.

——— (666)
AVIATSIIA SPETSIAL'NOGO PRIMENENIIA NA POROGE 1936 G. [SPECIALIZED AVIATION ON THE THRESHOLD OF 1936]. Grazhdan. Aviatsiia 5 (12): 7–9. December 1935. [In Russian.] Libr. Cong.

Reviews accomplishments in various fields and refers to the operations in crop pest and mosquito control in 1935. In spite of a record achievement in dusting 510,000 ha., only 85 percent of the plan was carried out. The locust-control work in Central Asia and in the Orenburg region, together with a shortage of insecticides, are held responsible for the failure.

——— (667)
NE POBEDA, A PORAZHENIE [NOT A VICTORY BUT A DEFEAT]. Grazhdan. Aviatsiia 5 (10): 8–11. October 1935. [In Russian.] Libr. Cong.

Describes airplane-control operations against *Locusta migratoria* in the reed beds of the Kazakhstan rivers Syr-Dar'ia and Chu. Eleven commercial planes under the command of engineer-pilot Kazarinov were assigned to Syr-Dar'ia. Work began on May 23 and was concluded in the first few days of July. Each plane treated about 9,000 ha., averaging 160 ha. per hr. Since 96,000 ha. were dusted, although the plan only called for 70,000 in this area, the operation would appear to have been a great success. However, losses caused by damage to planes, poor discipline of operators, and inefficient management, were far too great. Points out mistakes to be avoided in the 1936 campaign for locust extermination.

——— (668)
PROIZVODSTVENNAIA AVIATSIIA NA POROGE 1935 G. [INDUSTRIAL AVIATION ON THE THRESHOLD OF 1935]. Grazhdan. Aviatsiia 5 (1): 5–7. January 1935. [In Russian.] Libr. Cong.

Preliminary reports by the aviation crews present a bright picture of the importance of the airplane in the national economy. Refers to errors in 1934 work caused by: (1) inaccurate data on pest populations in Central Asia, (2) organizational and technical difficulties, (3) unsatisfactory apparatus. However, extermination of *Dociostaurus maroccanus* was achieved in Tadzhikistan, southern Kazakhstan, and Transcaucasia. There was no decrease in malaria cases because the failure to use ground equipment on small areas nullified the work of the planes.

——— (669)
RABOTA SAMOLETOV NA KHLOPKE [WORK OF AIRPLANES IN COTTON FIELDS]. Na Zashch. Sotsialist. Urozhaia 1935, No. 6, pp. 30–31. June 1935. [In Russian.] Libr. Cong.

The plan called for the dusting of 72,000 ha. of cotton in 1935, but it was doubtful that it could be carried out because of the lack of calcium arsenate. Poor results were obtained from the sulfur concentrate substituted in the control of spider mites (*Tetranychus spp.*), the failure being credited to unsuitable particle size of the concentrate.

——— (670)

SAMOLETY NA ZASHCHITU KHLOPKA [AIRPLANES FOR THE PROTECTION OF THE COTTON CROP]. Grazhdan. Aviatsiia 5 (6): 10–13. June 1935. [In Russian.] Libr. Cong.

Statistics for the years 1930–34 show that the shortage of sulfur has brought airplane work against cotton pests to a standstill. A sulfur concentrate was used by UzNarkomzem but proved too fine; therefore only 61 ha. were dusted of the 4,000 in the contract. Ultrasera, which contains only 16 percent sulfur, although effective against *Epitetranychus althaeae*, was too expensive to be practicable. Discusses operational difficulties and the slow progress of research, with suggestions for improvements.

——— (671)

VYPOLNIT' PLAN PO BOR'BE S SARANCHEĬ [FULFILLING THE PLAN ON LOCUST CONTROL]. Grazhdan. Aviatsiia 5 (4): 6–7. April 1935. [In Russian.] Libr. Cong.

The 1935 plan exceeds that of 1934. Reviews reasons for failure to fulfill the planned quota in 1934; cites cases of Tadzhikistan and southern Kazakhstan, where needs were overestimated because of inaccurate preliminary observations; urges increased efforts to assure success of the aviochemical method.

MIKHAĬLOV-SENKEVICH, IA. [M.] (672)

KAKIE SAMOLETY NUZHNY DLIA RABOTY V SEL'SKOM I LESNOM KHOZIAĬSTVE [TYPES OF PLANES NECESSARY FOR THE WORK IN AGRICULTURE AND FORESTRY]. Grazhdan. Aviatsiia 5 (5): 32–33. May 1935. [In Russian.] Libr. Cong.

Refers to specific requirements for construction and equipment.

NAUDÉ, T. J. (673)

LOCUST CONTROL BY MEANS OF AEROPLANES. Inter-State Locust Conf., Pretoria. Rpt. of Proc. 1934: 73–80. 1935. 429 In84

Results of tests with sodium arsenite against resting swarms. Discussion, pp. 80–82.

OFFICE INTERNATIONAL D'HYGIÈNE PUBLIQUE, COMMISSION DE LA FIÈVRE JAUNE. (674)

RAPPORT . . . ADOPTÉ PAR LE COMITÉ PERMANENT . . . DANS SA SESSION D'OCTOBRE 1935. Off. Internatl. d'Hyg. Pub. [Paris] Bul. Mens. 27 (12): [2369]–2370. December 1935. 449.75 Of2

Includes observations on the statement by Dr. Russell, delegate from British India, concerning mosquito control on airplanes and at airports.

PIERCE, C. C., GRIFFITTS, T. H. D., and MICHEL, C. (675)

SUR LA DESTRUCTION DES MOUSTIQUES À BORD DES AÉRONEFS. I–IV. Off. Internatl. d'Hyg. Pub. [Paris], Bul. Mens. 27 (3): 550–560. March 1935. 449.75 Of2

Contents:

I. Procédés efficaces pour la destruction des moustiques à bord des aéronefs, by T. H. D. Griffitts, pp. [550]–553. Urges the necessity for destroying insects in aircraft. Where there is danger of a yellow fever epidemic, the planes should be fumigated with hydrocyanic acid gas (Zyklon or Zyklon Discoids). A good grade of pyrethrum extract in oil makes the best spray. The fusilage section should be screened.

II. Destruction des moustiques et autres insectes à bord des aéroplanes, by C. Michel, pp. 553–557. Besides the danger from insect vectors of disease, there is also trouble from cockroaches, which feed on the glue and dope in the wings of the plane. Reviews work at Miami, Fla., and states that the pyrethrum-oil mixture used is not satisfactory against insects other than mosquitoes. Describes fumigation with hydrocyanic acid gas used at the rate of 8 oz. per 1,000 cu. ft. Carboxide was somewhat less effective, and was too difficult to handle.

III. Expériences préliminaires sur la destruction des moustiques par le Carboxide, by C. C. Pierce, pp. 557–559. The purpose of the experiments was to determine the lethal concentration of Carboxide (1 part ethylene

oxide, 9 parts carbonic acid) for short periods of time. Six lb. of Carboxide with 1 hr. of exposure gave approximately the same results as 12 lb. with ½ hr. exposure, and doses of 6 lb. for 2 hr., and 12 lb. for 1 hr. have had comparable results. In all cases the mosquitoes (*Aedes aegypti*) which survived refused to bite during the following 24 hr. Further experiments are needed to show whether the effect persists for much longer periods.

IV. Annexe: Circulaire No. 55, du [U. S.] Public Health Service. Washington, May 13, 1933. Signed H. S. Cumming, pp. 559–560.

RAFES, P. M. (676)

PROTIVOSARANCHEVYE RABOTY V SREDNEĬ AZII V 1935 G. [LOCUST CONTROL WORK IN CENTRAL ASIA IN 1935]. Na Zashch. Sotsialist. Urozhaĭa 1935, No. 2, pp. 41–42. February 1935. [In Russian.] Libr. Cong.

Describes difficulty in estimating the number of planes actually needed in different localities from the requests sent in by these localities, and how it affects total planning project.

REED, J. D. (677)

THE USE OF AIRPLANES IN AGRICULTURE. Fla. State Hort. Soc. Proc. (1935) 48: 97–98. 81 F66

General discussion of insect control by airplane as introduction to a demonstration.

RUDNEV, D. F. (678)

METODĬ OBSLIDUVANNIA Ĭ OBLIKU ZARAZHENOSTI LISIV SOSNOVOIU NICHNITSEIU PANOLIS FLAMMEA SCHIFF. [METHODS OF DETERMINING THE SEVERITY OF INFESTATION BY THE PINE NOCTUID, P. FLAMMEA]. Kief. Acad. des Sci., Inst. de Zool. et Biol. Rech. sur l'Ecol. des Anim. Terrestres, No. 2, pp. 57–134. 1935. [In Ukranian.] 410.9 K545R

Airplane dusting was carried out against *Panolis flammea* in the Department of Kharkov during May and June 1930. Calcium arsenite was distributed in 98-ft. bands over 13 sq. miles of forest at the rate of 7 lb. per acre. Mortality averaged 80 percent and in some instances reached 95 to 100 percent. Only a negligible number of pupae were found in the soil at the end of the summer.

RUKAVISHNIKOV, B. I. (679)

SHIRE DOROGU NOVYM PREPARATAM DLIA BOR'BY S MALIARIĬNYM KOMAROM [MAKE WIDER THE ROAD FOR NEW PREPARATIONS FOR MALARIAL MOSQUITO CONTROL]. Grazhdan. Aviatsiia 5 (4): 10–11. April 1935. [In Russian.] Libr. Cong.

In 1935 airplane dusting against mosquitoes reduced the loss of work days on the state farm Kara-Chala in Azerbaidzhan by 1.8 percent. About 75 percent of the total area dusted was malaria territory in 1934. Only a shortage of insecticides prevents the use of the airplane on a much larger scale. Reports on experimental work with Arsmal, Oleogumbrin (a clay and waste oil mixture), and Oleoarsenite (Oleogumbrin containing 10.8 arsenic) as substitutes for paris green. A factory for the production of Oleoarsenite will be built in Baku; but, in the meantime, the mixture must be prepared in the localities where the control work is carried on.

SHIPITSINA, N. K. (680)

MAKSIMAL'NYĬ I MINIMAL'NYĬ RAZMER CHASTITS ULAVLIVAEMYKH LICHINKAMI ANOPHELES MACULIPENNIS [MAXIMUM AND MINIMUM SIZE OF PARTICLES SWALLOWED BY THE LARVAE OF ANOPHELES MACULIPPENIS]. Med. Parazitol. i Parazitar. Bolezni 4 (5): 381–389. 1935. [In Russian. French summary, pp. 388–389.] 448.8 M469

Reports tests made in connection with dusting programs. Dissection of 102 larvae after they had been fed filtered water containing quartz sand showed that the 1st-instar larvae could swallow particles from 22.8 to 34.2μ in diameter. Such particles were about 20 percent of the width of the larval head, and the percentage increased with each molt. Particles swallowed by 4th-instar larvae ranged from 68 to 165.3μ in size, which represented 31.2 percent of head widths. Since the particles of paris green manufactured in the U. S. S. R. do not as a rule exceed 20μ, even the 1st-instar larvae can swallow them.

SQUIER, P. (681)
BUGS AND PLANES. Natl. Aeronautic Mag. 13 (10): 8–10, 30, illus. November 1935. Libr. Cong.

Condensed version *in* Conservation 2 (1): 6. February 1936. 279.8 C763
Popular account, covering 10 years of insect control by the airplane method in United States and abroad.

SUDAN MEDICAL SERVICE. (682)
REPORT, 1935–1938. 4 Nos. Khartoum, McCorquodale & Co., Ltd., n. d. Army Med. Libr.

Each report contains sections on sanitary control of aircraft and the collection of insects from aircraft.

SYMES, C. B. (683)
INSECTS IN AEROPLANES. A BRIEF REPORT AND SUGGESTIONS. Kenya Med. Dept. Rec. Med. Res. Lab., No. 6 (Ent. Sect.), 16 pp., illus. Nairobi, 1935. 448.9 K42

Reprinted without illustrations *in* League of Nations Health Organ. Quart. Bul. 5 (1): 79–86. March 1936. 449.8 L47
Gives the distribution of *Aedes aegypti* and other mosquito vectors of yellow fever in Kenya, Uganda, and the Sudan. States that the present methods of treating planes are inadequate, and makes the following suggestions: (1) Fumigate with hydrocyanic acid gas planes that are grounded for one or more nights; (2) disembark passengers and luggage through mosquito traps; fit with insectproof doors and windows all planes used regularly on North and Central African routes, and keep all inspection panels closed during overhauls; (4) free all airdromes from mosquitoes, insects, and rats.

THOMPSON, A. C. (684)
POWER EQUIPMENT FOR THE VEGETABLE PRODUCER. Market Growers Jour. 57 (6): [363], 369–370. Sept. 15, 1935. 6 M34

Airplane dusting, p. 369.

TRÄGÅRDH, I. (685)
THE ECONOMIC POSSIBILITIES OF AEROPLANE DUSTING AGAINST FOREST INSECTS. Bul. Ent. Res. 26 (4): 487–495, illus. December 1935. 421 B87

Gives detailed summary of dusting operations carried out against forest insects in Europe from 1925 to 1934. About 94,065 ha. were dusted from the ground and 63,930 ha. by airplane. Discounts injurious effects of calcium arsenate on wildlife and on bees, but discusses the use of contact poisons as substitutes. Compares varying methods of airplane dusting used in different countries. Estimates that the total cost of airplane dusting can be reduced to 20 Swedish crowns per ha., which he believes is a remunerative investment when balanced against losses from insect injury.

WILLIAMS, C. L., and DREESSEN, W. C. (686)
THE DESTRUCTION OF MOSQUITOES IN AIRPLANES. A PRELIMINARY NOTE. U. S. Pub. Health Serv. Rpts. 50 (20): 663–671. 1935. 151.65 P96

Airplane infestation with *Aedes aegypti* as a major problem in yellow fever quarantine work. Carboxide is not sufficiently toxic in short exposures required for plane fumigation. Concentrated oil extracts of pyrethrum (2 percent pyrethrins) are quite toxic, even in 5-min. exposures, when used 2 to 4 gm. per 1,000 cu. ft. The fumigant and apparatus do not weigh more than 3 or 4 lb.

——— and DREESSEN, W. C. (687)
A NONFLAMMABLE PYRETHRUM SPRAY FOR USE IN AIRPLANES. U. S. Pub. Health Serv. Rpts. 50 (41): 1401–1404. Oct. 11, 1935. 151.65 P69

French translation, with added table, *in* Off. Internatl. d'Hyg. Pub. [Paris] Bul. Mens. 27 (12): [2371]–2376. December 1935. 449.75 Of2
Preparation contained 1 part pyrethrum extract in kerosene (2 percent pyrethrins) and 4 parts carbon tetrachloride (containing no pyrethrins). Toxicity to *Aedes aegypti* was 100 percent in 5-min. exposure when sprayed 5 cu. cm. per 1,000 cu. ft. Without the kerosene, pyrethrum in carbon tetrachloride required a very high concentration which was not tolerated by the observers.

YOUNG, H. W. (688)
DEVELOPMENTS IN CROP DUSTING. Pop. Aviation 16 (1): 25–26, 50, illus. January 1935. Libr. Cong.

Refers to the business built up by Leslie G. Boyd of Portland, Oreg., and cites qualifications of a good service operator.

1936

ANONYMOUS. (689)
DESTROYING PLANT PESTS. Soc. Brit. Aircraft Construct., Ltd. [News Letter] A. 802, pp. 8–9, processed. 1936? Libr. Cong.

On contract, the Canadian Airways dusted the pea fields of a canning factory with nicotine to control aphids (*Macrosiphum pisi*). Planes flying at a speed of 85 to 90 miles per hr. and at a height of 10 ft. laid a swath 30 ft. wide. Thirty min. were sufficient to spread 650 lb. of dust over 20 acres, and a total of 75 acres were dusted.

——— (690)
EXPÉRIENCES FAITES DANS L'INDE BRITANNIQUE SUR LA DESTRUCTION DES MOUSTIQUES DANS LES AÉROPLANES. Off. Internatl. d'Hyg. Pub. [Paris] Bul. Mens. 28 (12): [2361]–2364. December 1936. 449.75 Of2

Discusses work on mosquito control at airports and on testing sprays for the control of adult mosquitoes.

APP, F. (691)
THE AEROPLANE—FUTURE SPRAYER. Amer. Agr. 133 (22): 6, illus. Oct. 24, 1936. 6 Am3

States that airplanes can be used on small eastern fields, and that oil sprays will be used as soon as proper formulas have been established.

BECKWITH, C. S. (692)
AIR DUSTING CALLED EFFECTIVE ON SOME NEW JERSEY BOGS. Cranberries 1 (2): 14–15, 17. June 1936. 80 C852

Tests against *Ophiola striatula* were made with a standard plane and an autogiro. In the plane tests, pyrethrum alone was ineffective; Supertox (pyrethrum, gypsum, rotenone mixture) gave excellent results. Equal proportions of pyrethrum and clay, applied 60 lb. per acre, gave good results in autogiro tests. The direct blast from the propeller of the autogiro made it more effective with lighter dusts. Greater facility in treating uneven bogs is the major asset in air-machine dusting in New Jersey.

——— (693)
CRANBERRY AND BLUEBERRY INVESTIGATIONS. N. J. Agr. Expt. Sta. Ann. Rpt. (1935/36) 57: 36–41. 100 N46S

Includes summary of experimental work against *Ophiola striatula* by airplane and autogiro, using pure pyrethrum or Supertox (pyrethrum, rotenone, gypsum mixture). The heavier gypsum dust settled faster and was more effective.

——— (694)
CRANBERRY MEN ATTACK FROM AIR. N. J. Agr. 18 (5): 3. September/October 1936. 275.28 N46

Use of airplanes and autogiros in the control of the blunt-nosed leafhopper, *Ophiola striatula*.

BERLAND, L. (695)
L'EXPLORATION BIOLOGIUE DE L'ATMOSPHÈRE EN AVION ET L'EMPLOI POSSIBLE DE CETTE MÉTHODE EN MÉTÉOROLOGIE. Météorologie [Paris], January/February 1936, pp. [28]–35, illus. Weather Bur. Libr.

Describes and illustrates a collecting net to be attached to wings of planes. Tests showed the air to be filled with insects and vegetable debris to a height of over 16,000 ft.

BINSON, G. (696)
ÉTAT SANITAIRE DES GRANDES LIGNES AÉRIENNES MONDIALES ET CONVENTION SANITAIRE INTERNATIONALE POUR LA NAVIGATION AÉRIENNE. 62 pp., maps. Bourg, Imprimerie Berthod, 1936. (Thèses, Faculté de Méd. et de Pharm. Lyon, 1936/1937, No. 46.) Army Med. Libr.

Ch. V, Les Mesures contre la Fièvre Jaune, pp. 43–56.
Control of *Aedes aegypti*.
References, pp. 61–62.

BOLDYREV, V. F., BUKHGEĬM, A. N., POPOV, P. V., SAVZDARG, E. E., SVIRIDENKO, P. A., and TUPIKOV, V. K. (697)
OSNOVY ZASHCHITY S.-KH. RASTENIĬ OT VREDITELEĬ I BOLEZNEĬ [FUNDAMENTALS OF THE PROTECTION OF FARM CROPS FROM PESTS AND DISEASES]. 773 pp., illus. Moskva, Gosudarstvennoe Izd. Kolkhoznoĭ i Sovkhoznoĭ Literatury, 1936. [In Russian.] 423 B635

Airplane-dusting methods and apparatus, pp. 670–676.

CHESNUTT, E. (698)
WINGS OVER WEEVIL. Amer. Cotton Grower 2 (2): 6–7, illus. July 1, 1936. 72.8 Am32

Reviews the history of cotton dusting by airplane against *Anthonomus grandis*.

CROSBY, C. R., and BISHOP, S. C. (699)
AERONAUTIC SPIDERS WITH A DESCRIPTION OF A NEW SPECIES [MICRONETA MERIDIONALIS N. SP.] N. Y. Ent. Soc. Jour. 44 (1): 43–49. March 1936. 420 N48J

Lists the spiders collected by airplane at Tallulah, La., by P. A. Glick, with a record of height at which found.

CURRIE, J. H. (700)
PEST CONTROL FROM THE AIR. Pacific Rural Press 132 (5): 103, illus. Aug. 1, 1936. 6 P112

DANILOVA, M. I., and MIRZAÎAN, A. A. (701)
VODNYĬ FAKTOR PRIARAKSINSKOĬ POLOSY SSR ARMENIĬ [THE WATER FACTOR OF THE PRIARAKSINSKIĬ REGION OF ARMENIAN SSR]. Perm. Gosud. Univ. im M. Gor'kogo. Uchen. Zap. 1 (4): 65–76, illus. 1936. [In Russian. English summary, pp. 75–76.] 511 P42

Includes report on airplane dusting against *Anopheles maculipennis* in the District of Erivan (Armenia) in 1932. A mixture of paris green and road dust (proportion of 1:3 or 1:2) was effective when applied at the rate of 4.6 oz. per acre from a plane flying 60 miles per hr.

DOANE, R. W., VAN DYKE, E. C., CHAMBERLIN, W. J., and BURKE, H. E. (702)
FOREST INSECTS. Ed. 1, 463 pp., illus. N. Y., McGraw-Hill, 1936. 423 D65F

Condensed historical sketch of control by airplane, pp. 32–35.

ECKERT, J. E., and ALLINGER, H. W. (703)
RELATION OF AIRPLANE DUSTING TO BEEKEEPING. Jour. Econ. Ent. 29 (5): 885–895, illus. October 1936. 421 J822

Further observations on damage to bees following airplane application of calcium arsenate to tomato field near Davis, Calif. There was considerable drift of the poison, which increased with the height at which the plane was flown. The dust cloud hung close to the ground at a temperature below 56° F. but rose rapidly above 60° F. Less than half the dust released appeared to reach the vines or the ground. Two vaselined plates, placed on a farm ¾ mile from the field treated, caught enough arsenic to kill a large number of bees. There was no noticeable difference in mortality between closed and open colonies. The queens were not affected. The greatest injury was to bees which had worked in areas over which the dust had drifted, many colonies being reduced by 50 percent.

EIDMANN, H. (704)
EIN NEUES KONTAKTGIFT GEGEN DIE NONNE (DAS DETAL DER FIRMA E. MERCK, DARMSTADT). Ztschr. f. Forst– u. Jagdw. 68 (2): 91–108, illus. February 1936. 99.8 Z3

Detal was released by Merck in 1934, and in June 1935 field tests were made on 200 ha. of forest land in Ostpreussen against *Lymantria monacha*, using both airplane and ground equipment. At the rate of 25 kg. per ha., Detal was found most effective against 3d-instar larvae, giving 100 percent mortality in 2 days. There was some injury to the tender parts of plants. Insecticidal properties of Detal are similar to those of other current contact poisons (Forestit, pyrethrum, rotenone). Forestit and pyrethrum are, however, completely ineffective against the nun moth. Under field conditions, Detal is rendered harmless to animals and plants after 2 days by atmospheric moisture.

ESCHERICH, K. (705)
DER SIEG DER KONTAKTGIFTE IN DER FORSTSCHÄDLINGSBEKÄMPFUNG. Forstl. Wchnschr. Silva 24 (10): 76–77. March 1936. Harvard Univ. Arnold Arboretum Libr.

Discusses the substitution of contact insecticides for arsenicals. The Merck products, Forestit and Detal, are the most effective poisons against *Lymantria monacha*, *Panolis flammea*, etc., and are outstanding achievements of the German chemical industry.

FILMER, R. S. (706)
SPRAY AND DUST POISONING OF HONEYBEES IN NEW JERSEY. Jour. Econ. Ent. 29 (2): 322–324. April 1936. 421 J822

General discussion, including airplane application.

FRANCIS, E. H. (707)
DISTRIBUTION OF ARSENICALS FROM THE AIR. Natl. Shade Tree Conf. Proc. (1936) 12: 168–177. 99.9 N218

Report on experimental work near Morristown, N. J., against spring and fall cankerworms, *Paleacrita vernata* and *Alsophila pometaria*. A wet spray mixture (lead arsenate, fish oil, paraffin oil, and water) was used, and the results over the 119-acre observation plot were good. The cost per acre for the airplane was $7.23 as against $14.33 for a 400-gal. power sprayer. The amount of labor used was cut 10 times, 90 percent control was obtained, and the time cut by about 14. Recommends further study to perfect the insecticide mixture and the equipment.
Discussion, pp. 177–181.

FRANKLIN, H. J. (708)
GROUND DUSTING DECLARED MORE EFFICIENT ON MOST CAPE BOGS. Cranberries 1 (3): 9. July 1936. 80 C852

The present type of airplane, although practical over bogs of 20 acres or more, cannot be successfully used over small bogs.

——— (709)
INJURIOUS AND BENEFICIAL INSECTS AFFECTING THE CRANBERRY. Mass. Agr. Expt. Sta. Bul. 327 (Ann. Rpt. 1934/35), pp. 30–32. 1936. 100 M38S

Extensive airplane-dusting experiments were carried out over 100 acres. It was found that more pyrethrum was required than with ground dusters, and that a better technique would have to be developed to insure even distribution. The airplane will probably prove useful for bogs of over 20 acres.

HIBBS, B. (710)
AUTOGIROS AGAINST INSECTS. Country Gent. 106 (4): 49. April 1936. 6 C833

Cites advantages of autogiros over airplanes for the control of insects in the cranberry bogs of New Jersey.

HICKS, E. P., and CHAND, D. (711)
A MOSQUITO SURVEY OF KARACHI AIR PORT. Rec. Malaria Survey India 6 (4): 515–535, illus. December 1936. 448.9 In2

Study of prevalence of *Aedes aegypti* and *Anopheles*, with discussion of the nature of the soil, the rainfall, and the prevailing winds. The larvicidal fish, *Lebias dispar*, has been an efficient predator. Gives recommendations for control of mosquito breeding, with estimates of cost.

References.

——— and CHAND, D. (712)
TRANSPORT AND CONTROL OF AËDES AEGYPTI IN AEROPLANES. Rec. Malaria Survey India 6 (1): 73–90, illus. March 1936. 448.9 In2

In tests with female *Aedes aegypti* sent by airplane from the Karachi airport, a large percentage reached Amsterdam alive, and several survived over a considerable part of the return trip. Inspection of 106 air liners arriving at the airport failed to show a single mosquito. Summarizes results of similar inspection work in other countries. Pyrocide (diluted 1:20 with kerosene) proved an efficient spray. Some of the tests seemed to show that the toxicity varied with the dose of Pyrocide, and that the degree of dilution was of minor importance. The spray was most effective in dry air. Suggests methods of mosquito-proofing airplanes.

References.

IBRAHIM PASCHA, A. (713)
L'AVIATION ET LA LUTTE CONTRE LES INSECTES. Rev. Aéronautique Internatl., No. 22, p. [402]. December 1936. Libr. Cong.

INTERNATIONAL SANITARY CONVENTION FOR AERIAL NAVIGATION, THE HAGUE, 1933. (714)
[ARTICLES.] U. S. Pub. Health Serv. Rpts. Sup. 120, 24 pp. 1936. 151.65 P96S

Includes various references to inspection and disinfestation of aircraft and airdromes.

*NEVSKII, V. P., and SHILONOK, A. A. (715)
AVIODUSTING EXPERIMENTS IN THE CONTROL OF THE CODLING MOTH. Sredne-Aziats. Fil. Nauch. Issled. Inst. Zashch. Rast. Trud. 1: 18–41. 1936. [In Russian. Uzbek and English summaries.]

Report on experimental work carried out in northern Uzbekistan in 1932 and 1933 against *Carpocapsa pomonella* on apples. A calcium arsenate dust containing 31 to 46 percent arsenic was used at the rate of 13½ to 18 lb. per acre. A dust cloud from 52 to 72 ft. in width was produced by a plane flying from 16 to 32 ft. above the trees. The first application was made 7 to 10 days after the end of the blossoming season and 4 more were made at similar intervals. Describes technique used to determine larval mortality. Low mortalities obtained from both airplane dusting and the ground spray check are ascribed to use of too low rates of application. The airplane dusting method can be successfully used against the codling moth in Central Asia with the use of correct dosages and proper consideration of weather conditions. It gives an even coverage on the crowns of the trees and effects economy in labor. With adequate precautions there is no danger to man or domestic animals. No scorching of foliage was observed under the favorable weather conditions which prevailed during these tests.—Abstract *in* Rev. Appl. Ent., A 27: 610. 1939.

OGANOV, L. I., NABOKOV, V. A., and BEKLEMISHEV, V. N. (716)
O METODIKE ANALIZA I OTSENKI REZUL'TATOV BOR'BY S LICHINKAMI MALÎARIĬNOGO KOMARA [ON THE ANALYSIS AND EVALUATION OF THE RESULTS IN THE CONTROL OF LARVAE OF THE MALARIAL MOSQUITO]. Med. Parazitol. i Parazitar. Bolezni 5 (2): 155–170, illus. 1936. [In Russian. French summary.] Army Med. Libr.

The effectiveness of larval control by airplane dusting with paris green can be checked by systematic observation of density of adults in their daytime resting places. Studies of *Anopheles maculipennis messeae* near Moscow showed that if the first of a series of applications is made after pupae are

already present, an increase in numbers follows within 5 days. Poor dusting technique which permits survival of 3d- or 4th-instar larvae causes an adult population increase in 10 or 15 days. If 1st-instar larvae survive, the increase occurs in about 20 days. Graphs show incidence during spring and summer seasons.

References.

RED, B. F. (717)

DIXIE'S DUST PATROL. THE DOLLARS SPENT ON CROP DUSTING IN THE SOUTH INCREASE ANNUALLY AS MORE AND MORE PLANTERS LOOK TO THE AIRPLANE FOR CROP SALVATION. South. Flight 5 (6): 12–13, illus. June 1936. Libr. Cong.

Describes dusting plane, agitator, Venturi tube, action of the dust cloud, and hazards pilot must meet.

R[OESNER], O. H. (718)

WORLD'S LARGEST DUSTER PLANE. Calif. Cult. 83 (13): 475. June 20, 1936. 6 C12.

A trimotored monoplane was remodeled for crop dusting by Louis F. Vremsack.

RUKAVISHNIKOV, B. I. (719)

OZHOGI SELSKOKHOZÎAÎSTVENNYKH KUL'TUR PRI AVIAOPYLIVANII DLÎA BOR'BY S LICHINKAMI MALÎARIÎNYKH KOMAROV [SCORCHING OF CULTIVATED PLANTS BY DUSTS APPLIED BY AIRPLANES FOR THE CONTROL OF THE LARVAE OF MALARIAL MOSQUITOES]. Med. Parazitol. i Parazitar. Bolezni 5 (3): 426–437. 1936. [In Russian.] Army Med. Libr.

Airplane application of arsenical dusts for *Anopheles* control in the Soviet Union resulted in severe injury to rice when applied in the presence of humidity or dew. In the northern Caucasus and Kazakhstan, trouble was caused by the following practices: (1) allowing dust to become damp and lumpy, so that it could not be evenly distributed; (2) using paris green without a carrier; (3) permitting planes to fly twice over the same strip. Rice in flower should not be dusted in the early morning when covered with dew.

SELWYN-CLARKE, P. S. (720)

YELLOW FEVER IN WEST AFRICA. League of Nations Health Organ. Quart. Bul. 5 (1): 69–78. March 1936. 449.8 L47

Two anti-yellow-fever airdromes have been established, and routine inspections of aircraft are made on arrival or departure. Suggests proofing, with durable mosquito gauze, of fuselage, baggage-storage space, and pilots' cabins.

SPRANGER, H. (721)

DAS INTERNATIONALE SANITÄTSABKOMMEN FÜR DIE LUFTFAHRT UND SEINE BEDEUTUNG VOR ALLEM FÜR DIE VERHÜTUNG DES GELBFIEBERS IM INTERNATIONALEN LUFTVERKEHR. Deut. Med. Wchnschr. 62 (13): 514–518, map. Mar. 27, 1936. 448.8 D48

Refers to the international agreement of 1934. Airplanes are disinfested of mosquitoes by use of a spray (1 part of 2 percent solution of pyrethrum in paraffin and 4 parts of 2 percent solution of pyrethrum in carbon tetrachloride). When 5 cu. cm. are used per 1,000 cu. ft., mosquitoes are killed in 5 min.

STAFFORD, J. (722)

ON GUARD AGAINST GERMS. AIRPLANES MUST BE WATCHED FOR INVADING ENEMIES THAT MAY CARRY DEADLY DISEASE IN SLENDER INSECT BODIES. Sci. News Letter 30 (812): 298–300, illus. Nov. 7, 1936. 470 Sci24

Deals with mosquitoes in relation to malaria and yellow fever, including the inspection and disinfestation of airplanes.

STANTON, T. A. (723)

LES INSECTES DANS LES AEROPLANES AU KENYA. Off. Internatl. d'Hyg. Pub. [Paris] Bul. Mens. 28 (7): [1357]–1360. July 1936. 449.75 Of2

Résumé of a note by Dr. C. B. Symes. Deals with preventive measures at Kisumu and Nairobi airports.

TRÄGÅRDH, I. (724)
FINNAS FÖRUTSÄTTNINGAR FÖR MASKINELL BEKÄMPNING AV SKOGSINSEKTER I SVERIGE [ARE CONDITIONS SUITABLE FOR THE CONTROL OF FOREST PESTS BY AIRPLANE OR POWER DUSTING]? Svenska Skogsvårdsför. Tidskr. 34 (1): 108–132, illus. 1936. [In Swedish. German summary, pp. 126–132.] 99.8 Sk5

Contains same material as given in item 685.

*——— (725)
SOME PROBLEMS OF MODERN FOREST ENTOMOLOGY. 12 pp. Budapest, [n. d.]

Reprinted *from* *Internatl. Union Forest Res. Insts. Cong., 9, 1936.

Deals in part with the economic possibilities of airplane dusting. Author believes that the value of the timber saved justifies the method.—Abstract *in* Rev. Appl. Ent., A 27: 514. 1939.

TSIOPKALO, V. L. (726)
BOR'BA S KHRUSHCHEM PUTEM OPYLIVANIÎA KORMOVYKH DEREV'EV ÎADOVITYMI VESHCHESTVAMI [THE CONTROL OF COCKCHAFERS BY MEANS OF DUSTING OF THE FOOD TREES]. Zashch. Rast., No. 9, pp. 92–110. 1936. [In Russian. English summary, pp. 109–110.] 421 P942

Results of experiments with *Melolontha hippocastani* to test claim that poisonous dusts are not effective against adult cockchafers. Dusts used were: calcium arsenite, paris green, sodium fluosilicate, sodium fluoride, calcium arsenate, and barium fluosilicate. The females proved much more resistant to the poison than the males. Concludes that dusting is only feasible in pine forests with little deciduous undergrowth, where beetles must feed on oaks confined to small plots which can be treated by airplane. Dusting should be done in the spring when females begin to appear in large numbers.

UNITED STATES TREATIES. (727)
SANITARY AERIAL NAVIGATION CONVENTION BETWEEN THE UNITED STATES OF AMERICA AND OTHER POWERS. Stat. L. 49: 3279–3312. 1935–36. [French and English texts.] L1.1

Concluded at the Hague, Apr. 12, 1933; ratified by President Franklin D. Roosevelt on June 13, 1935, with reservations.

Includes regulations on disinfestation of aircraft and baggage, delousing of passengers when necessary, etc.

The English text of the convention, together with the President's message of transmittal and a report from the Secretary of State recommending approval thereof, was also issued as U. S. 74th Congress, 1st Session, Senate Committee on Foreign Relations, Feb. 12, 1935, Executive G. Report to accompany Executive G is Executive Report No. 6 (May 13, 1935) of the Committee.

WATSON, J. R. (728)
THE ONION THRIPS (THRIPS TABACI LINDEN). Fla. Agr. Expt. Sta. Ann. Rpt. 1934/35, pp. 67–68. 1936. 100 F66S

A commercial pyrethrum dust was applied by airplane over considerable acreage. Control was satisfactory but not as effective as careful ground work.

WATSON, R. B. (729)
SOME PRELIMINARY OBSERVATIONS ON AIRPLANE DUSTING FOR ANOPHELES LARVAE CONTROL. South. Med. Jour. 29 (8): 862–867, illus. August 1936. Natl. Inst. Health Libr.

Experiments were made on Lake Wilson, Ala., to test efficacy of shoreline and acreage dusting to control breeding of *Anopheles quadrimaculatus*. Poor results from the shoreline tests lead the author to conclude that a tortuous shoreline with a heavy type of vegetation is not suitable for airplane dusting. The acreage tests were, however, extremely satisfactory. The plane, flying at a height of 75 ft. and a speed of 100 miles per hr., covered 3 acres per min. About 1 lb. of paris green was distributed per acre (83 particles per sq. in.), and larval mortality ranged from 17 percent (under the worst conditions) to 98 percent. The cost per acre was about a dollar less than with other methods.

1937

ANONYMOUS. (730)
AIR RAIDS—A DAIRY MENACE? Calif. Dairyman 16 (8): 7. May 8, 1937. 44.8 C12

Asserts that crop dusting by airplane is a cause of arsenical poisoning among cattle, poultry, and other livestock.

——— (731)
AUTOGIRO ON FARM. FLYING CLOSE TO THE GROUND, IT DUSTS AND SPRAYS FIELDS AND TREES, AGAINST INSECTS. Business Week, No. 402, pp. 38–39, illus. May 15, 1937. 280.8 Sy8

——— (732)
AUTOGIROS AND CHEMICALS USED IN CAMPAIGN TO SAVE ELMS. Canad. Ent. 69 (8): 187–188. August 1937. 421 C16

Autogiros employed by U. S. Department of Agriculture in aerial scouting to locate trees infected with Dutch elm disease which are to be marked for destruction with Silvicide.

——— (733)
MOSQUITOES ON AIRPLANES. U. S. Pub. Health Serv. Rpts. 52 (14): 414. Apr. 2, 1937. 151.65 P96

Condensation appears *in* Engin. News Rec. 118 (16): 589. Apr. 22, 1937. 290.8 En34

——— (734)
SEABROOK FARMS FIND CONTROL FOR APHIS ON PEAS. Canning Trade 59 (43): 12, 14. May 31, 1937. 286.83 T67

Refers to results of experiments at Seabrook Farms, Bridgeport, N. J., to develop a suitable apparatus and oil-based spray for airplane treatment of pea fields.

BECKWITH, C. S. (735)
CONTROL OF THE BLUNT-NOSED LEAFHOPPER [OPHIOLA STRIATULA]. Amer. Cranberry Growers' Assoc. Proc. Ann. Conv. (1937) 68: 9–14. 81 Am 35C

Includes results of work with both autogiro and airplane. Pyrethrum has usually been applied as a dust from an airplane. Since spraying with a kerosene-pyrethrum mixture requires much less pyrethrum per acre, the author recommends that more attention be paid to this method. Spraying from an autogiro has been successfully carried on for 3 yr.

——— and DOEHLERT, C. A. (736)
CONTROL OF RHAGOLETIS POMONELLA (WALSH) IN CULTIVATED BLUEBERRY FIELDS. Jour. Econ. Ent. 30 (2): 294–297. April 1937. 421 J822

Undiluted derris dust (5 percent rotenone), when applied by airplane or autogiro at the rate of 10 to 15 lb. per acre, will kill the adults in cultivated blueberry patches. In New Jersey the work should be done about June 27–30 and July 7–10.

BERLAND, L. (737)
DONNÉES RÉCENTES SUR LE TRANSPORT AÉRIEN D'ANIMAUX ET DE PLANTES, D'APRÈS DES RECHERCHES FAITES EN AVION. Soc. de Biogéog. Compt. Rend. 14 (119): 25–28. May 21,1937. Amer. Geog. Soc. Libr.

BURLESON, T. C. (738)
COLUSA COUNTY LEADS THE WAY. Amer. Bee Jour. 77 (4): 183–184. April 1937. 424.8 Am3

Colusa County (Calif.) Board of Supervisors voted, Feb. 16, 1937, to instruct the district attorney to draft an ordinance prohibiting use of poisonous materials for airplane dusting (sulfur and liquid sprays not included).

CAMPBELL, L. W. (739)
EXPERIMENTS TO CONTROL SUGAR BEET LEAFHOPPER [EUTETTIX TENELLUS], 1936. Jour. Econ. Ent. 30 (5): 687–688. October 1937. 421 J822

Tests with atomized spray oils containing 4 percent of a 20:1 pyrethrum extract. Airplane tests gave a control of 97.6 percent and ground machine tests 98.2 percent when the material was applied 5 gal. to the acre. The plane

covers 105 to 120 acres per hr., and the ground machine sprays 60 to 90 acres per day. The kerosene type of oil used as a carrier for pyrethrum requires the addition of a neutral white oil, the amount varying with the type of atomizer and the method of atomization.

COVELL, G., and AFRIDI, M. K. (740)
EXPERIMENTAL APPLICATION OF PARIS GREEN FROM AIRCRAFT. Rec. Malaria Survey India 7 (1): 93–103, illus. March 1937. 448.9 In2

Report on preliminary work done in 1936 in the Bela region of India, near Delhi. The work was abandoned when it became evident that other methods were more practicable and less costly. Soapstone powder was found to be a suitable diluent. Cites the disadvantages of the airplane method and concludes that, under present conditions, it is not of practical value for use in India.

CROSS, H. (741)
AN OPEN LETTER TO ALL CROP DUSTERS. Calif. Dairyman 16 (14): 6. Aug. 14, 1937. 44.8 C12

Relates to arsenical poisoning of livestock and bees from airplane or other crop dusting.

CURRIE, J. H. (742)
AIR RAID ON PESTS. Farm Jour. 61 (7): 18, illus. July 1937. 6 F2212

Popular account of crop pest control by airplane and autogiro.

DANIL'CHENKO. (743)
RABOTA PO AVIAOPYLENIIŪ V KIEVSKOĬ OBLASTI V 1936 G. [AIRPLANE DUSTING IN THE PROVINCE OF KIEV IN 1936]. Med. Parazitol. i Parazitar. Bolezni 6 (3): 446. 1937. [In Russian.] 448.8 M469

Breeding places of *Anopheles maculipennis* were treated with nine applications of paris green between May 20 and Sept. 26, 1936. Over 183 sq. miles were covered at the rate of 2.8 to 4.3 oz. per acre. There was a mortality of 66.7 to 100 percent among 1st-instar larvae and 75.1 to 100 percent in later instars.

DEBOER, H. (744)
MESURES ANTIMOUSTIQUES AUX AÉRODROMES. DÉSINFESTATION DES AÉRONEFS EN OUGANDA. Off. Internatl. d'Hyg. Pub. [Paris] Bul. Mens. 29 (6): 1157–1158. June 1937. 449.75 Of2

Brief review of measures in force at Entebbe airport to prevent transportation of mosquitoes, and projected measures for the new hydroplane service, at Laropi and Port Bell.

DICKSON, H. (745)
THE STORY OF KING COTTON. 309 pp., illus. New York, Funk & Wagnalls, 1937. 281.372 D56

Popular account of the control by airplane of *Anthonomus grandis*. pp. 99–110.

DIETRICH, E. (746)
HOW TO BE A DUSTER—IN ONE EASY LESSON. Pilot 10 (3): 18–19, illus. March 1937. Libr. Cong.

Crop dusting is as much an expert's job as airline flying. The pilot must know not only his plane but also a good deal about insects and poisons. He must be able to sell his services; must be an expert at low flying; and must be able to react quickly in dangerous situations.

ECKERT, J. E. (747)
HOW TO COMBAT THE MENACE OF AIRPLANE DUSTING. Amer. Bee Jour. 77 (4): 172–173, illus. April 1937. 424.8 Am3

Beekeepers must: (1) organize local associations which will affiliate with the American Honey Producers' League; (2) carry on an educational program; and (3) resort to courts of justice in emergencies. Program should recognize that grower has right to apply poison to his fields, but must insist that it be done in such a manner as not to harm interests or property rights of others.

FAURE, J. C., and DE VILLIERS, F. J. (748)
RECENT DEVELOPMENTS IN THE TECHNIQUE OF LOCUST DESTRUCTION IN SOUTH AFRICA. Internatl. Locust Conf., 4, Cairo, 1936, Proc., 4, App. 16, 7 pp. 1937. 429 In83

Includes discussion of the 1934 and 1935 airplane-dusting experiments with sodium arsenite against *Nomadacris*. Eight to 10 lb. per acre proved an effective ratio if applied from a height of 80 to 100 ft. Powders with particles of 0.06 to 0.07 average diameter proved most satisfactory. Toxicity to livestock precludes dusting of resting swarms except in sparsely stocked country, deserts, or swampy areas. Use of the airplane for scouting work should be fully investigated.

FELT, E. P. (749)
BALLOON DRIFT AND INSECT DRIFT. Ent. News 48 (1): 17. January 1937. 421 En88

As an extension of work done from 1923 to 1925 with the N. Y. State Conservation Commission, the Bartlett Tree Research Laboratories released 5,000 balloons in localities where Dutch elm disease occurred. It is probable that elm bark beetles may be carried long distances by wind drift and infect remote areas.

——— (750)
BALLOONS AS INDICATORS OF INSECT DRIFT AND OF DUTCH ELM DISEASE SPREAD. Bartlett Tree Res. Labs. Bul. 2: 3–10, illus. February 1937. 99.9 B28

Results confirmed the belief that wind drift of infected beetles influences the spread of the disease to distant localities.

FILMER, R. S. (751)
POISONING OF HONEYBEES BY ROTENONE-DERRIS DUSTS. Jour. Econ. Ent. 30 (1): 75–77. February 1937. 421 J822

Rotenone-derris dust was applied to lima beans from an airplane when the plants were coming into bloom. Apparently the rotenone poisoned the nectar of these plants. Laboratory tests supported this theory and indicated that rotenone dusts, either as contact or stomach poison, are as toxic to bees as arsenicals.

GOL'TSMAÏER. (752)
USTANOVLENIE MINIMAL'NYKH DOZIROVOK ÎADOV I PRIMANOCHNYKH VESHCHESTV V NAZEMNYKH RABOTAKH I VYÍÂVLENIE TEKNICHESKOÏ ÉFFEKTIVNOSTI AVIAMETODA V BOR'BE S SARANCHEVYMI, S UCHETOM IKH VIDOVOGO I VOZRASTNOGO SOSTAVA I METEOROLOGICHESKIKH USLOVIÏ [DETERMINATION OF THE MINIMUM DOSAGES OF POISONS AND BAITS IN AERIAL WORK AGAINST ACRIDIDS AND OF THE TECHNICAL EFFECTIVENESS OF THE AERIAL METHOD, TOGETHER WITH THE ESTIMATION OF THEIR SPECIES AND AGE AND METEOROLOGICAL CONDITIONS]. Zashch. Rast., No. 12, p. 191. 1937. [In Russian.] 421 P942

Work done in western Siberia. Sodium arsenite baits broadcast from airplanes gave 60 to 94 percent mortality, and airplane dusting up to 95 percent.

This article is a part of Notes on and Summaries of Reports of the Scientific Research Institutes of Plant Protection for the Year 1935, edited by I. V. Vasil'ev, pp. 187–191.

GRAY, H. F. (753)
TRANS-PACIFIC AIRPLANE TRANSPORT OF MOSQUITOES. Alameda Co. Mosquito Abatement Dist. Rpt. 1937: 13–15. [Processed.] 428 AL1

Report on the investigation following the collection of a live mosquito on a Pan-American clipper which left Alameda (Calif.) airport August 4, arriving in Honolulu, August 5. The insect was determined at Honolulu as *Anopheles maculipennis*, but later identified at the U. S. National Museum as *Culiseta incidens*.

——— and RAMSEY, C. T. (754)
AIRPLANE TRANSPORTATION OF MOSQUITOES. Conf. Mosquito Abatement Off. in Calif. Proc. and Papers (1937) 8: 15–19. [Processed.] 428 C763

Mr. Gray discussed the misidentification of *Culiseta incidens* as *Anopheles maculipennis* when found on a plane at Honolulu. Mr. Ramsey, of the Pan-American Airways, outlined practical procedures to avoid mosquito transportation.

HAMILTON, C. C. (755)
ADHERENCE AND RATE OF SETTLING OF LEAD ARSENATE DUSTS FOR AUTOGIRO AND AIRPLANE APPLICATION. Jour. Econ. Ent. 30 (3): 399–404. June 1937. 421 J822

Studies on modifications of the dust to permit ready delivery from the container, avoid undue drift, and increase adherence. Oil (fish oil in particular) added to lead arsenate gave increased adherence, which was directly proportional to amount used. The factors of settling and adherence were improved by adding Celite to the oil and lead mixture.

IBRAHIM PASCHA, A. (756)
DAS FLUGWESEN IM KAMPF GEGEN INSEKTENSCHÄDLINGE. Bl. des Deut. Roten Kreuzes 16 (2): 71–72. February 1937. Amer. Red Cross Libr.

The possibility of using the airplane in insect pest control was considered before World War I, but the first practical experiment was made in 1921. Reviews airplane dusting in the United States and Germany. The complete failure of ground methods against a locust outbreak in southern Russia caused the adoption of airplane technique there. Best results in the control of *Anopheles* mosquitoes can be obtained with the airplane.

INTERNATIONAL LOCUST CONFERENCE, CAIRO, 1936. (757)
RESOLUTION 14. THE USE OF POISONS IN LOCUST CONTROL. Internatl. Locust Conf., 4, Cairo, 1936, Proc., pp. 66–71. 1937. 429 In83

Lists modifications to conclusion of Third Congress on use of aircraft against locusts.

INTERNATIONAL LOCUST CONFERENCE, CAIRO, 1936. UNITED KINGDOM DELEGATION. (758)
THE USE OF POISONS IN LOCUST CONTROL. MEMORANDUM SUBMITTED BY THE UNITED KINGDOM DELEGATION. Internatl. Locust Conf., 4, Cairo, 1936, Proc., App. 15, 15 pp. 1937. 429 In83

Pt. I. Locust control by means of aircraft, pp. [1]–9.

Records conclusions drawn from the report on airplane dusting with sodium arsenite against *Nomadacris septemfasciata* submitted by H. H. King to the Third International Locust Conference, 1934. Gives a general discussion of the experiments and takes up various controversial points. Notes that later reports indicate a tendency of the locusts to avoid the sound of aircraft and the effect of this reaction on the placing of the dust cloud. Cites difficulties which develop when it is necessary to treat a swarm more than once and recommends the use of several aircraft working together (with proper protection of pilots from poison dust). There is a possibility that the toxic effect of poison to locusts may be due to contact rather than to inhalation. Danger to livestock and crops makes it impossible to recommend dusting of resting swarms with the present insecticides. Concludes that this type of control is a weapon of great potential promise and suggests lines of experiment, including trial of the autogiro.

KOZLOVA, E. N. (759)
PRIMENENIE BONIFITSIROVANNYKH PREPARATOV PRI AVIAOPYLIVANII V BOR'BE S AZIATSKOĬ SARANCHEĬ (THE USE OF IMPROVED PREPARATIONS FOR AERIAL DUSTING IN THE CONTROL OF LOCUSTA MIGRATORIA L.). Vsesoĭuzn. Akad. Selsk.-Khoz. Nauk im. V. I. Lenina, Inst. Zashch. Rast. Itogi Nauch.-Issled. Rabot 1936, pt. 1, pp. 51–53. 1937. [In Russian.] 423.92 L541

Experiments were conducted in 1936 in the Karmakchinskiĭ region of southern Kazakhstan to settle the problem of lowering the dosage of calcium arsenite in aerial dusting. Spindle oil added to calcium arsenite, 4 to 5 percent by weight, increased its effectiveness. Results proved that the addition of oil to the insecticides increased the effectiveness of the dusting and made possible a decrease in dosage.

MARCUS, B. A. (760)
"DETAL"—BESTÄUBUNG GEGEN DEN KIEFERNSPANNER (BUPALUS PINIARIUS L.). Ztschr. f. Angew. Ent. 24 (1): 71–86. April 1937. 421 Z36

A detailed account of work against *Bupalus piniarius* in 1936. Detal (a dinitro compound) was dusted by airplane over pine forests in Oberpfalz at the rate of 37 lb. per acre. The action of the chemical was unusually prompt and gave a mortality of 99.8 percent. There was slight scorching, but the

trees recovered promptly. Operators were obliged to protect themselves by means of goggles and respirators. Recommends that dusted berries should not be eaten until after 10 days.
References.

*Mishnaevskiĭ, M. N., ed. (761)
THE MALARIA MOSQUITO AND MEASURES OF CONTROL. 224 pp., illus. Rostov-on-Don, Azovo-Chernom. Kraev. Knigoizd., 1937. [In Russian.]
The four parts of this publication constitute a handbook—prepared by I. G. Ioff, A. A. Dozenko, and V. A. Nabokov—for the use of health officers of local antimalaria organizations. Control measures discussed by I. G. Ioff in part I include airplane application of paris green. A history of airplane dusting against *Anopheles* larvae in the Soviet Union since 1929 is given by V. A. Nobokov in part IV (pp. 204–219).—Abstract *in* Rev. Appl. Ent. B, 25: 266–267. 1937.

Nissley, C. H. (762)
SEASONAL FACTS AND SUGGESTIONS FOR VEGETABLE GROWERS. N. J. State Hort. Soc. News 18 (4): 920–921, illus. May 1937. 81 N46
Dusting tomatoes by airplane in New Jersey, p. 920.

Pemberton, C. E. (763)
LOCAL PLANT QUARANTINE AND THE PRESENT EMERGENCY ARISING THROUGH TRANS-PACIFIC AIRPLANE SERVICE. Hawaiian Acad. Sci. Proc. Ann. Mtg. (1936–37) 12: 11–12. 1937. (Bernice P. Bishop Mus. Spec. Pub. 31.) 500 H31A

Pepper, B. B. (764)
PINK AND GREEN APHIDS AND THEIR CONTROL. Canner 84 (5): 54–58. Jan. 9, 1937. 286.83 C16
Article with same title, but with variation in text, *in* Canning Trade 59 (24): 28, 30, 32, 34, 36, illus. Jan. 18, 1937. 286.83 T67
Data on airplane spraying experiments against *Macrosiphum solanifolii* on tomatoes were collected through the cooperation of Dr. Frank App of Seabrook Farms, Bridgeton, N. J., and Giro Associates, Inc., of New York City. In the first experiment an airplane was used to apply various mixtures of derris and pyrethrum extracts in oil. Results were poor. In a second test with the equipment adjusted to produce a finer fog, there was inadequate coverage and severe burning of the plants. The apparatus was transferred to an autogiro for the third test. In this machine it was possible to use a water-nicotine-soap mixture which gave very promising results. Further experiments are advised.

Rothkirch, von (765)
SCHÄDLINGSBEKÄMPFUNG IN USA. Deut. Forstwirt 19 (73): 795–796. Sept. 10, 1937. Duke Univ. Libr.
Discusses the May 1937 experiments with autogiro spraying in the National Historical Park, Morristown, N. J.

Sergiev, P. G., and Kovtun, A. S. (766)
ORGANIZATS̑IIA BOR'BY S MALIARIEĬ V SSSR K DVADTS̑ATILETIIU VELIKOĬ OKTIABR'SKOĬ SOTS̑IALISTICHESKOĬ REVOLUTS̑II [ORGANIZATION OF MALARIA CONTROL WORK ON THE TWENTIETH ANNIVERSARY OF THE OCTOBER REVOLUTION]. Med. Parazitol. i Parazitar. Bolezni 6 (6): 723–755. 1937. [In Russian.] 448.8 M469
Deals with control of Anophelinae. Since oiling of breeding places has proved too expensive, dusting with paris green and other arsenicals is being substituted. Both airplane and ground methods are used.

Sindersberger, M., and Marcus, A. (767)
DAS AUTRETEN DER FOHRENEULE IN MITTELFRANKEN 1928–1931. Mitt. aus der Staatsforstverwalt. Bayerns 22, 118 pp., illus. Munich, 1937. 99.9 B342
Forestit was used in successful dusting experiments against *Panolis flammea*. Under excellent weather conditions about 11,300 acres in Mittelfranken were treated by airplane and 2,700 acres by power units.

Symes, C. B. (768)
LES INSECTES DANS LES AÉRONEFS. Off. Internatl. d'Hyg. Pub. [Paris] Bul. Mens. 29 (6): 1150–1157. June 1937. 449.75 Of2

Detailed discussion of manner in which insects (especially mosquitoes) enter aircraft, with methods of proofing against them or of killing those which do enter. Recommends spraying interior of planes on landing with the following mixture: pyrethrum (1 part), white kerosene (16 parts), carbon tetrachloride (68 parts).

United States Public Health Service. (769)
MOSQUITOES ON AIRPLANES. U. S. Pub. Health Serv. Rpts. 52 (14): 414. Apr. 2, 1937. 151.65 P96

Report of 69 inspections made at Miami, Fla., during November 1936. Lists mosquitoes caught.

Welch, J. H. (770)
REPELLING FOREIGN ENEMIES OF OUR PLANTS. Tex. Farming and Citric. 14 (1): 7, 20, illus. July 1937. 80 T31

Includes inspection of airplanes arriving in the Brownsville area for abandoned fruit or flowers, and inspection of express packages, passengers' luggage, etc.

Williams, C. L. (771)
REPORT OF THE COMMITTEE ON YELLOW FEVER. U. S. Pub. Health Serv. Ann. Conf. State and Territorial Health Off. with U. S. Pub. Health Serv. Trans. (1937) 35: 70–81. [Processed.] 151.65 C76

Reviews possibility of introducing yellow fever into the United States via airlines. Gives recommendations for the control of *Aedes aegypti* at airports and in adjacent country. Methods of disinfesting planes are brought out in the discussion by F. J. Underwood, C. L. Williams, J. A. Hayne, B. L. Lloyd, and others, pp. 81–90.

Zumpt, F. (772)
DIE GEFAHR DER GELBFIEBERVERBREITUNG DURCH DEN LUFTVERKEHR. *In* Hamburg. Inst. f. Schiffs- u. Tropenkrank. Festschr. Bernhard Nocht, pp. 699–704, illus. Hamburg, Kommissionsverlag Friederichsen de Gruyter & Co., 1937. 448 H172

Discusses the spread of yellow fever from its place of origin in West Africa and the role of *Aedes* spp. as vectors. States that the situation has become serious with the increase in airplane transportation. Reviews the literature on control experiments, with especial reference to mosquitoes in airplanes.

1938

anonymous. (773)
AIRPLANE AND YELLOW FEVER. Amer. Jour. Pub. Health 28 (9): 1116–1118. September 1938. 449.9 Am3J

Discusses dissemination of *Aedes aegypti* by airplane.
References.

——— (774)
[DAMAGE SUIT FOR DEATH OF BEES CAUSED BY DUSTING.] Air Law Rev. 9 (2): 209–210. April 1938. Libr. Cong.

Case decided in favor of the plaintiff. Reviewer believes the decision was on the ground that "the dusting of a field from an airplane in the ordinary mode of execution constitutes a nuisance to adjoining land owners."

——— (775)
DESTRUCTION OF MOSQUITOES IN AEROPLANES. A TEST FLIGHT. Lancet [London] 234 (5990): 1414. June 18, 1938. 448.8 L22

Twelve boxes of mosquitoes were placed in various compartments, and the plane sprayed during flight with Deskito by means of Phantomyst and Larmuth spray types of apparatus. Results were very satisfactory.

ALTGELT, G. A. (776)
INSECT CONTROL REDUCES PRODUCTION COSTS. A FEW PRACTICAL TIPS ON INSECT POISONS AND THEIR APPLICATION. Acco Press 16 (8): 9–10, illus. Aug. 1938. 6 Ac2

Deals with airplane dusting with arsenicals against *Anthonomus grandis* and *Alabama argillacea* on various Texas cotton plantations.

BRASIER-CREAGH, E. B. (777)
AERIAL WAR ON THE MOSQUITO, AN ACCOUNT OF THE WORK DONE BY THE MOSQUITO PATROL IN INDIA. Pop. Flying 7 (2): 70–73, illus. May 1938. Libr. Cong.

Discusses work of the Malaria Survey of India against anophelines along the Jumna River near Delhi. The plane, a DH 83 Fox Moth, had the dust hopper inside the cabin, and the paris green was distributed from Venturi tubes placed under the fuselage. Gives official list of disadvantages and points out how they may be overcome. Recommends a 2-engined monoplane with wing-borne hopper and Venturi tubes. The cost of treating large areas should not exceed 3s. per acre.

CALDWELL, A. F. (778)
CHEMISTRY AND PREPARATION OF INSECT SPRAYS CONTAINING PYRETHRUM. Brit. Med. Assoc. Malaya Branch. Jour. 1 (4): [336]–341. March 1938. Boston Med. Libr.

Care should be taken in the choice of essential oils to mask the kerosene odor in the kerosene solution of pyrethrins. Too much of certain oils is nauseating in small places such as airplanes. For airplane use, carbon tetrachloride (50 percent concentration) has been advised for addition to sprays as a means of reducing the inflammability of the kerosene.

CARNAHAN, C. T. (779)
ACTIVITIES OF THE U. S. PUBLIC HEALTH SERVICE IN MOSQUITO CONTROL FOR AIRPLANES. Fla. Anti-Mosquito Assoc. Ann. Mtg., Rpt. (1938) 12, 7 pp. [Processed.] 420 F663

Discusses the danger from yellow fever, and reviews work of the U. S. Public Health Service on the inspection and disinfestation of airplanes. Includes tables of the results of inspections at Miami, Fla., from October 1936 to February 1938.

CUMMING, H. S. (780)
MESURES DE QUARANTAINE CONTRE LA FIÈVRE JAUNE. Off. Internatl. d'Hyg. Pub. [Paris], Bul. Mens. 30 (3): (536]–537. March 1938. 449.75 Of2

Refers to the disinfestation of airplanes as a mosquito control measure.

——— (781)
RAPPORT SUR LES REFUGES POUR MOUSTIQUES DANS LES AÉRONEFS. Off. Internatl. d'Hyg. Pub. [Paris], Bul. Mens. 30 (9): [1998]–2001, illus. September 1938. 449.75 Of2

Examination of the types of planes used by the Pan American Airways disclosed an astonishing number of places which might harbor mosquitoes, such as the inside of the wings and the hollows inside the ailerons, rudders, etc. It is evident that only the most accessible places inside the planes have been disinfested, and that the outsides have been completely ignored. Suggests the installation of a system of pipes to distribute an insecticidal vapor throughout the wings.

EVANS, I. B. P. (782)
PASTURE, CROP AND INSECT PROBLEMS OF THE UNION. ANNUAL REPORT OF THE DIVISION OF PLANT INDUSTRY. Farming in So. Africa 13 (153): 519–538, illus. December 1938. 24 So842

Also issued *as* Union of South Africa. Dept. Agr. and Forestry. Reprint 105, 20 pp. [Pretoria] 1938. 24 Un3R

Discusses airplane dusting with cryolite against the wattle bagworm, *Acanthopsyche junodi* pp. 535.

GAINES, J. C., and EWING, K. P. (783)
THE RELATION OF WIND CURRENTS, AS INDICATED BY BALLOON DRIFTS, TO COTTON FLEA HOPPER DISPERSAL. Jour. Econ. Ent. 31 (6): 674–677, map. December 1938. 421 J822

Planes, using specially constructed traps, collected 44 adults and 20 nymphs of *Psallus seriatus*, 1 adult at a height of 2,000 ft. above the ground. In the balloon-release tests, the 346 balloons recovered had an average drift of 42.6 miles to the north and northeast. Concludes that adult flea hoppers may be carried long distances from croton-infested fields in light soil areas to large cotton fields in heavy soil areas.

HAMILTON, C. C. (784)
INSECTICIDES APPLIED BY AUTOGIRO TO CONTROL CANKERWORMS INFESTING FORESTED AREAS. Jour. Econ. Ent. 31 (4): 513–518. August 1938. 421 J822

Tests of arsenical compounds against *Alsophila pometaria*, *Paleacrita vernata*, and *Ennomos subsignarius* produced a satisfactory commercial spray (23 percent lead arsenate, 9 percent fish oil, 1 percent petroleum oil, and 67 percent water). Kill was proportional to the quantity of lead arsenate applied per acre. The author believes it possible to reduce the amount still further. Recommends addition of protective colloids to autogiro sprays to prevent flocculation of lead arsenate particles and evaporation of water. Further experiments with a mixture of lead arsenate, Celite, and petroleum oil may produce a dust which will not drift and yet will adhere well to foliage.

JAMES, J. R. (785)
BANANA SAVERS. Pop. Aviation 23 (6): 51–52, 70, illus. December 1938. Libr. Cong.

Dusting bananas in Honduras and Guatemala for the disease, sigatoka. Also gives account of dusting to control grasshopper plague in Honduras. Only one or two trips could be made per hour as it was necessary to scrape and clean motors, air intakes, and windshields after each flight.

KIKER, C., FAIRER, C. D., and FLANARY, P. N. (786)
FURTHER OBSERVATIONS ON AIRPLANE DUSTING FOR ANOPHELES LARVAE CONTROL. South. Med. Jour. 31 (7): 808–813, illus. July 1938. Army Med. Libr.

Account of work by the Tennessee Valley Authority with airplane-dusting control of *Anopheles* breeding in the Wheeler Reservoir. Describes the open biplanes used (a Huff Daland and a Stearman Model 4–D), the equipment installed, and the technique of application. While ½ lb. of paris green per acre did not give uniform results, satisfactory control was obtained with 1 lb. per acre. The total cost per acre (per application) was 37¢.

KING, W. V., and MCNEEL, T. E. (787)
EXPERIMENTS WITH PARIS GREEN AND CALCIUM ARSENITE AS LARVICIDES FOR CULICINE MOSQUITOES. Jour. Econ. Ent. 31 (1): 85–86. February 1938. 421 J822

Includes report on two tests with wet paris green applied from an autogiro equipped for spraying liquids. The plane flew—at an altitude of 8 to 10 ft. above the ground and a speed of about 45 miles per hour—over two lines of dishes containing 4th-instar larvae of *Culex quinquefasciatus*. In both experiments the larval mortality was high, the paris green remained moist enough to sink on striking the water, and a fairly even distribution was observed over the central part of the swath. The practical application will have to be determined by tests over natural breeding places.

LARSON, A. O., BRINDLEY, T. A., and HINMAN, F. G. (788)
BIOLOGY OF THE PEA WEEVIL [BRUCHUS PISORUM] IN THE PACIFIC NORTHWEST WITH SUGGESTIONS FOR ITS CONTROL ON SEED PEAS. U. S. Dept. Agr. Tech. Bul. 599, 43 pp., illus. Washington, D. C., 1938. 1 Ag84Te

Several fields of Austrian winter field peas in Oregon were dusted by airplane in the spring of 1934. Undiluted calcium arsenate was applied at the rate of 15 to 22½ lb. per acre. Control was incomplete.

LOCKWOOD, S. (789)
PEST CONTROL BY AIRPLANE. Pacific Rural Press 135 (13): 360–361. Mar. 26, 1938. 6 P112

A summary of airplane-dusting experiments which cites results with different chemicals and against different pests.

MACKIE, F. P., and CRABTREE, H. S. (790)
THE DESTRUCTION OF MOSQUITOES IN AIRCRAFT. Lancet [London] 235 (5999): 447–450, illus. Aug. 20, 1938. 448.8 L22

Account of experiments by the Imperial Airways Company to devise a method for disinfesting airplanes in flight. Since kerosene-based insecticides are inflammable and the addition of carbon tetrachloride affects human beings unpleasantly, an aqueous-based pyrethrum spray was used. It was applied by means of a Phantomyst sprayer and Larmuth ejectors. This apparatus and the ventilation system of the plane are described and illustrated. Gives detailed summaries of five tests and of a report by J. W. Munro. Concludes that this treatment results in complete destruction of mosquitoes on cabin-type aircraft.

O'BRIEN, A. J. R. (791)
RENSEIGNEMENTS RELATIFS AUX INDEX AEDES AEGYPTI DANS LES DIVERS PAYS D'AFRIQUE POUR 1937 I. Off. Internatl. d'Hyg. Pub. [Paris] Bul. Mens. 30 (9): [1970]–1973. September 1938. 449.75 Of2

Includes table on inspection of airports.

PEPPER, B. B. (792)
THE UTILIZATION OF THE AIRPLANE FOR THE TREATMENT OF PEA APHID [MACROSIPHUM PISI]. [3 pp. 1938. Processed.] 431 P31

Presented at the Pea Aphid Conference, Richmond, Va., Dec. 27, 1938.

In 1937 atomized oil sprays (rotenone, pyrethrum, nicotine) were tested in various combinations, and various activators were tested with the pyrethrum and rotenone. Aphid mortality ranged from 8 to 77 percent, being greatest with the nicotine and lowest with the pyrethrum. A check on commercially sprayed fields (oil-rotenone and oil-nicotine) showed a mortality of from 50 to 80 percent. There was serious burning of foliage with oil used. In 1938 over 4,000 acres in New Jersey were sprayed commercially with a laboratory-tested blend of oil mixed with either rotenone or 80 percent free (anhydrous) nicotine. Mortality was 75 to 80 percent. Sprayed acreage averaged 1 ton of shelled peas per acre against less than 700 lb. for the untreated acreage. There was no foliage injury. The cost of 2 applications by airplanes was slightly less than the cost of 1 application by ground machines. Lists advantages and disadvantages of airplane spraying under New Jersey conditions.

RICHARDS, H. (793)
RAPPORT SUR LA DÉSINSECTISATION DES AÉRONEFS À L'AÉRODROME DE KHARTOUM. Off. Internatl. d'Hyg. Pub. [Paris], Bul. Mens. 30 (3): 563–567. March 1938. 449.75 Of2

Report on inspections made from June 2, 1934 to July 2, 1937. In almost all cases, the planes had been treated before entering the Sudan. Describes method of disinfestation used at Khartoum and gives distribution of the mosquitoes within the plane. Before 1936 the commercial preparations Flit and Shelltox had been used. In February 1936 the following spray was adopted: pyrethrum extract (5.8), oil of citronella (2.0), carbon tetrachloride (49), and kerosene (43.2). Over 1,000 planes were inspected and only 49 found infested with mosquitoes (97 culicines and 10 anophelines). *Aedes aegypti* was not collected. Also lists other insects caught.

RIPLEY, L. B., and PETTY, B. K. (794)
AEROPLANE DUSTING AGAINST WATTLE BAGWORM [ACANTHOPSYCHE JUNODI]. Farming in So. Africa 13 (152): 423. November 1938. 24 So842

Instructions to wattle growers on how to make pretreatment surveys, how to estimate amounts of cryolite needed, etc.

Ross, G. A. P. (795)

LA DESTRUCTION AUTOMATIQUE DES MOUSTIQUES DANS LES AÉRONEFS ET LE VECTEUR DE LA FIÈVRE JAUNE DANS LES TRAVERSÉES AÉRIENNES EN AFRIQUE. Off. Internatl. d'Hyg. Pub. [Paris], Bul. Mens. 30 (9): [2002]–2031, illus. September 1938. 449.75 Of2

Discusses dangers inherent in the increased volume of aerial traffic from Africa and gives results of hydroplane inspections at Durban. Describes methods of treatment used. The second part is concerned with investigations made in London and Durban on automatic disinfestation of planes while in flight. A spraying apparatus designed by W. A. Larmuth and the commercial Phantomyst sprayer were finally installed in a passenger hydroplane of the Imperial Airways. A detailed account is given of their performance and of the sprays used.

Tooke, F. G. C. (796)

INVESTIGATIONS ON THE BIOLOGY OF EUPROCTIS TERMINALIS, WALK., THE PINE BROWN TAIL MOTH AND ITS CONTROL BY AEROPLANE AND GROUND DUSTING. Union So. Africa. Dept. Agr. and Forestry. Sci. Bul. 179, 48 pp., illus. Pretoria, 1938. 24 So84S

The airplane experiments discussed in detail were made in 1936 using a 3-engined Hercules troop carrier supplied by the Department of Defence. Calcium arsenate was found superior to natural cryolite when used at the rate of 20 lb. per acre, and good larval mortality was obtained. The plane proved unsuited to the work, and requirements for a satisfactory machine are stated. Results are compared with those from the 1937 ground-dusting tests, and the author believes airplane dusting superior over large forest areas. Ground dusting is profitable on areas of 500 acres or less, and for small, localized infestations. Refers to a "buffer one" (distinct in atmosphere and climate) at about the height of the tree crowns, which has adverse effect on ground dusting.

Vaĭnshteĭn, N. B. (797)

RESUL'TATY ISPYTANIÎA LARVITSIDNYKH SVOĬSTV SHCHELKOVSKOĬ ZELENI [RESULTS OF TESTING THE LARVICIDAL PROPERTIES OF SHCHELKOVO GREEN]. Med. Parazitol. i Parazitar. Bolezni 7 (2): 214–215. 1938. [In Russian. French summary, p. 215.] 448.8 M469

Reports experiments made in the summer of 1937 against anopheline larvae with Shchelkovo green, a mixture of gypsum and paris green (31.9 percent arsenic trioxide, 18 percent copper oxide, 5.3 percent acetic acid, and 7.3 percent water). This insecticide and paris green, both mixed with kieselguhr at the rate of 3:7, were applied at the rate of 0.9 lb. per acre in comparative tests. Both gave complete mortality of all stages of larvae. Airplane distribution of the Shchelkovo green mixture at the same rate over 5,000 acres killed all larvae in 6 hr. The plane flew at a height of 8 ft., depositing an effective amount of dust in a strip 33 ft. wide.

Watson, R. B., Kiker, C. C., and Johnson, H. A. (798)

THE ROLE OF AIRPLANE DUSTING IN THE CONTROL OF ANOPHELES BREEDING ASSOCIATED WITH IMPOUNDED WATERS. U. S. Pub. Health Serv. Rpts. 53 (7): 251–263, illus. Feb. 18, 1938. 151.65 P9

Breeding of *Anopheles* in impounded lakes on the Tennessee River has caused a malaria problem. During the summer of 1937 airplanes were successfully used for application of paris green dust in a cooperative experiment by the Tennessee Valley Authority and the U. S. Public Health Service. Describes equipment and technique used, and gives figures on unit costs. Reports on experiments made to determine efficiency of dusts and gives suggestions for improvement in application.

Whitehead, F. E. (799)

SCATTERING GRASSHOPPER BAIT FROM AN AIRPLANE. Jour. Econ. Ent. 31 (1): 130. February 1938. 421 J822

Experimental flights were made from various heights using a bait of 100 lb. of bran, 5 lb. of white arsenic, and 2 gal. of cheap-grade lubricating oil. It proved possible to spread the bait evenly from a plane equipped for dusting cotton with calcium arsenate. Although expensive, about 5¢ per lb., it would be practical when time was an important factor.

WILLIAMS, C. L. (800)
THE IMPORTANCE OF CONTROLLING DOMESTIC MOSQUITOES. Fla. Anti-Mosquito Assoc. Ann. Mtg. Rpt. (1938) 12, 44 pp. [Processed.] 420 F663

Increased danger from yellow fever because of aircraft travel necessitates renewed efforts to eradicate *Aedes aegypti*.

1939

ANONYMOUS. (801)
NEW MALARIAL PROBLEM CARRIED TO BRAZIL BY STOWAWAY INSECT. Newsweek 13 (15): 26, map. Apr. 10, 1939. Libr. Cong.

Anopheles gambiae brought to Brazil either on ships or airplanes.

BECKWITH, C. S. (802)
LEAFHOPPER [OPHIOLA STRIATULA] AND WEED CONTROL. Amer. Cranberry Growers' Assoc. Proc. Ann. Conv. (1939) 70: 7–11. 81 Am35C

Greater mortality occurs among immature leafhoppers. In New Jersey the most effective dusting dates are between June 15 and 25. Oil spraying from aircraft offers the best possibility for good work, but is not recommended for general use until further experience has been gained.

*BOGDANOV, L. L. (803)
THE APPLICATION OF THE VAPO-DUST METHOD FROM AEROPLANES. *In* Vsesoiuzn. Akad. Selsk.-Khoz. Nauk im. V. I. Lenina. The application of emulsions of petroleum and tar oils for the control of pests of agricultural crops, pp. 90–93. Moskva, 1939. [In Russian.]

Discusses the advantages of airplane spraying with oil emulsions, and outlines future work.—Abstract *in* Rev. Appl. Ent., A 29: 655. 1941.

CADY, E. L. (804)
AIR FIGHTING BEATS PESTS. Air Trails 12 (6): 27, 68, illus. September 1939. Libr. Cong.

Refers to experiments in controlling *Anopheles* by airplane dusting with paris green. The ideal plane must have maximum maneuverability, must be able to travel slowly, and must answer its controls promptly.

COPELAND, G. H. (805)
SHOCK TROOPS OF SCIENCE. AVIATION AND ENTOMOLOGY SHARE IN NEW VICTORIES IN THE BATTLE OF THE INSECTS. Commentator 5 (1): [117]–122. February 1939. Libr. Cong.

Refers to rapid transport of parasitic insects by clipper planes, such as sending the Amazon fly, *Metagonistylum minense*, to destroy *Diatraea saccharalis* in St. Kitts.

DODDS, P. (806)
FLYING FARMERS. AG STUDENTS ON TRAVEL TRIP SEE PLANES USED FOR CROP DUSTING AND SEEDING AS GROUP SWINGS INTO GULF AREA. Iowa Agriculturist 39 (8): 8. March 1939. 6 Io9

ENGLE, L. H. (807)
HUNDRED FLYING IMMIGRANTS RETURN ON ATLANTIC CLIPPER. Science 36 (1): 13. July 1, 1939. 470 Sci24

Meigenia floralis, parasite of *Crioceris asparagi*.

FELT, E. P. (808)
BALLOON RELEASES AND DUTCH ELM DISEASE SPREAD. Bartlett Tree Res. Labs. Bul. 3: 20–25, illus. December 1939. 99.9 B28

Includes further discussion of wind drift of infected beetles.

GLICK, P. A. (809)
THE DISTRIBUTION OF INSECTS, SPIDERS, AND MITES IN THE AIR. U. S. Dept. Agr. Tech. Bul. 673, 150 pp., illus. Washington, D. C., 1939. 1 Ag84Te

During the 5-year period, August 1926 to October 1931, experiments were made with traps attached to airplanes. In 1,314 flights made near Tallulah, La., and 44 in Mexico, about 30,033 specimens of insects, spiders, and mites were collected at altitudes varying from 20 to 15,000 ft. The catch included 4 n. g. and 24 n. spp. Diptera were the most abundant and included species

of *Anopheles, Aedes, Culicoides,* and *Simulium.* Tables list the insects collected and the altitudes at which found. Concludes that modern aircraft constitute a new factor in the dissemination of diseases and insect pests.

References, pp. 146–150.

HOFMANN, C. (810)

DIE NEUZEITLICHE BEKÄMPFUNG FORSTLICHER GROSSCHÄDLINGE MIT BESONDERER BERÜCKSICHTIGUNG VON NONNE (LYMANTRIA MONACHA L.) UND KIEFERNSPANNER (BUPALUS PINIARIUS L.). Nachr. über Schädlingsbekämpf. 14 (1): 1–43, illus. March 1939. [In German. English summary, p. [57.] 464.8 N112

Outlines development of airplane control method. Discusses laboratory and field tests with the new contact dusts "2152" and "2172," products of I. G. Farbenindustrie Aktiengesellschaft. These dusts, while toxic to the larvae, are not poisonous to bees or warm-blooded animals and cause almost no scorching. Larval instars of the nun moth are particularly susceptible. Total mortality of the first 4 instars of the pine geometrid was obtained with the use of about 45 lb. per acre. Recommends large-scale airplane application against the nun moth.

References, pp. 41–43.

IMBASCIATI, B. (811)

LA PROFILASSI DELLA FEBBRE GIALLA PER L'AERONAVIGAZIONE NEI PAESI CALDI. Ann. d'Ig. [Rome] 49 (8): 542–552, map. August 1939. 449.8 An72

Reviews information on the spread of yellow fever, with special reference to air travel. Discusses situation in Africa in relation to Italian interests. Mosquito destruction in towns and airdromes is not enough. Airplanes must be disinfested by a process simple enough to be applied by untrained personnel. The size and poverty of Africa make proper care of airdromes difficult, and measures at present employed do not meet international specifications. Airplanes from suspected places should be thoroughly searched on arrival. Mechanical means of protection should be installed in all planes serving Africa.

KEEN, F. P. (812)

INSECT ENEMIES OF WESTERN FORESTS. U. S. Dept. Agr. Misc. Pub. 273, rev., 210 pp., illus. Washington, D. C., 1939. 1 Ag84M

Airplane dusting, pp. 178–179.

KIRCHER, W. H. (813)

HOPPERS DIE IN AIR WAR. PLANES SPREAD BAIT WHERE SURFACE SPREADERS CAN'T GO. Farmer 57 (16): 5, 13, illus. Aug. 12, 1939. 6 F2211

Account of bait-spreading operations near Williston, N. Dak. About 20 lb. were distributed per acre at a cost of 8¢ per acre.

KOROTKOV, V. M., ED. (814)

AVIATSIIA V SEL'SKOM KHOZIAISTVE SSSR [AVIATION IN USSR AGRICULTURE]. 68 pp. Moskva, Aeroflot, 1939. [In Russian.] 333 Un33

At head of title: Glavnoe Upravlenie Grazhdanskogo Vozdushnogo Flota pri SNK SSSR.

Includes achievements in the control of insect pests.

KUSHEV, V. L. (815)

OPYT AVIAKHIMICHESKOI BOR'BY S SOSNOVOI PIADENITSEI NA URALE [AN EXPERIMENT IN THE AVIOCHEMICAL CONTROL OF THE PINE GEOMETRID IN THE URALS]. Lesotekh. Akad. im. S. M. Kirova. Trud. 54: 55–65, illus. 1939. [In Russian.] 99.9 L542

A calcium arsenite mixture was dusted at the rate of 3.6 to 4.5 lb. per acre over about 308 acres of forest near Chelyabinsk infested with *Bupalus piniarius.* The planes flew between 16 and 80 ft. from the tops of the trees. The most favorable time for application was between 3 and 8 a. m., or in the evening after the wind dropped. A count was made of the dead larvae beneath selected trees after dusting. All branches were cut from these trees and all dead and living larvae counted, and also those on similar branches cut before dusting or from 4 to 5 days later. The average mortality was

only 50 percent, probably due to a heavy rain. Many larvae died later, however, and in November there was an average of less than 2 pupae per sq. yd.

LOCKWOOD, S. (816)
THE GRASSHOPPER OUTBREAK IN 1939. Calif. Dept. Agr. Bul. 28 (6): 393–410, illus. June 1939. 2 C12M

States that satisfactory kills were obtained from bait broadcast by airplanes. The planes, flying at about 50 ft. above the crop, could cover 200 acres an hour (actual flying time).

MCKAY, H. (817)
BUG FIGHTERS. Pop. Aviation 24 (6): 48–50, 82, illus. June 1939. Libr. Cong.

Discusses the mental and physical qualifications of a pilot, together with the experience and training required. Describes planes and hoppers and the pilot's duties in regard to proper handling and care of his plane. After 50 hr. of flying, the plane should be completely gone over; after 100 hr. every single item on inspection sheets must be checked; after 575 hr. each engine must be removed and completely overhauled.

MCNAMARA, H. C. (818)
ARSENATE INJURY TO BLACK LOCUST CAUSED BY DRIFT. Miss. Farm Res. 2 (7): 1. July 1939. 100 M69Mi

Arsenicals, drifting from cotton airplane-dusting operations, produced defoliation.

MANNS, T. F. (819)
MODERN SPRAYING AND DUSTING OUTFITS. Peninsula Hort. Soc. [Del.] Trans. (1939) 53: 42–45, illus. (Del. State Bd. Agr. Bul., v. 29, No. 5.) 81 P37

Brief account of use made of the airplane in spraying and dusting.

METCALF, C. L., and FLINT, W. P. (820)
DESTRUCTIVE AND USEFUL INSECTS. Ed. 2, 981 pp., illus. N. Y., McGraw-Hill, 1939. 423 M563

Airplane dusting and spraying, pp. 330–331, 451, 636, 671.

*MIRZAĬAN, A. A. (821)
RESUL'TATY DEĬSTVIĬA ARSENITA KAL'TSIĬA NA LICHINOK ANOFELES V USLOVIĬAKH PRIMENENIĬA ĬADA S SAMOLETA, SNABZHENNOGO AEROPYLOM SISTEMY POPOVA [RESULTS OF A DUSTING OPERATION AGAINST ANOPHELES LARVAE, USING CALCIUM ARSENITE APPLIED FROM A PLANE EQUIPPED WITH THE POPOV TYPE OF DUSTER]. Armenia Narod. Komis. Zdravookhraneniĭa Trop. Inst. Trud. 3: 88–93. 1939. [In Russian.]

MOISEEV, A. E. (822)
BOR'BA S MAĬSKIM ZHUKOM V LESOZASHCHITNYKH POLOSAKH [CONTROL OF THE MAY BEETLE IN PROTECTIVE STRIPS OF FOREST TREES]. Sotsialist. Zern. Khoz. 1939, No. 3, pp. 132–136, illus. [In Russian.] 59.8 So72

Damage done by *Melolontha hippocastani* in southeastern European Russia. The females feed before ovipositing and oviposit twice. Airplane dusting is feasible because the trees are planted in straight rows and can be covered in one flight. Dusting should be done immediately after emergence of adults and, if necessary, be repeated during the second feeding period.

NABOKOV, V. A. (823)
ANALIZ I OTSENKA RESUL'TATOV PRIMENENIĬA AVIAKHIM-METODA V BOR'BE S LICHINKAMI MALĬARIĬNOGO KOMARA V SSSR [ANALYSIS AND EVALUATION OF THE RESULTS OF THE USE OF THE AVIOCHEMICAL METHOD IN CONTROLLING LARVAE OF MALARIAL MOSQUITOES IN USSR]. Med. Parazitol. i Parazitar. Bolezni 8 (2): [165]–169. 1939. [In Russian.] 448.8 M469

Cites advances made in the technique of applying paris green for the control of *Anopheles* larvae. In 1937 breeding places over an area of almost 12,000 sq. miles were treated. Airplane dusting is not economical under all conditions, but is an important control measure for peat bogs, rice fields, and irrigated cotton-growing areas. It is the only solution for the reed-bed problem. Outlines briefly a program for further improvements.

NAUDÉ, T. J., RIPLEY, L. B., and PETTY, B. K. (824)
WATTLE BAGWORM [ACANTHOPSYCHE JUNODI] CONTROL BY AEROPLANE DUSTING. Union So. Africa Dept. Agr. and Forestry. Sci. Bul. 206, 12 pp. Pretoria, 1939. 24 So84S

Airplane dusting was entirely practicable. The plane used, a De Haviland Dragon Rapide, proved satisfactory. Over 95 percent mortality was obtained by natural cryolite at 20 lb. per acre. Ground dusting requires 30 lb., and costs about 1s. more per acre. Although dusting must be done at a time of year when weather conditions are least favorable, this difficulty is offset by the greater amount of work accomplished by the airplane method on the flying days available.

PEMBERTON, C. E. (825)
ENTOMOLOGY. A REPORT. Hawaiian Sugar Planters' Assoc. Com. Charge Expt. Sta. Rpt. 1937–38: 19–29. *In* Hawaiian Sugar Planters' Assoc. Ann. Mtg. (1938) Proc. 58. Honolulu, 1939. 65.9 H314

Midway Quarantine [against insects transported by airplane], pp. 27–28.

——— (826)
QUARANTINE MEASURES AGAINST INSECTS CARRIED BY TRANSPACIFIC AIRPLANES. Internatl. Soc. Sugar Cane Technol. Cong., 6, Baton Rouge, 1938, Proc., pp. 595–596. 1939. 65.9 In84

The menace to Hawaiian sugar industry represented by insects carried on planes from Manila to Honolulu resulted in the establishment of an entomologist, F. C. Hadden, on Midway Island as a cooperative project between the Hawaiian Sugar Planters' Association and the Pan American Airways. All planes are inspected and disinfested as they land for their regular overnight stop. Records are kept of the number and the species found dead and alive on arrival at both Midway and Honolulu. The results justify continuance of the project.

PINTO, C. (827)
DISSEMINAÇÃO DA MALARIA PELA AVIAÇÃO; BIOLOGIA DO ANOPHELES GAMBIAE E OUTROS ANOFELINEOS DO BRASIL. Inst. Oswaldo Cruz Mem. 34 (3): 293–430, illus. September/October 1939. 448.9 In74

The first part of the article summarizes results of airplane inspections at Miami, Fla., and indicates the strong possibility of the spread of *Anopheles gambiae* in Brazil by aircraft.

POTTS, S. F. (828)
CONCENTRATED MIXTURES FOR AERIAL SPRAYING. Jour. Econ. Ent. 32 (4): 576–580. August 1939. 421 J822

Summarizes results of experiments carried out since 1936, using arsenicals, derris, and pyrethrum and their derivatives; phenothiazine; sulfur; lime-sulfur concentrate; nicotine compounds; fluorine compounds; and bordeaux mixture. The laboratory tests were carried out with special reference to the composition and characteristics of the mixtures. The field tests particularly observed atomization, drift, effect of types of foliage on deposit, drying of the spray, foliage injury, and adherence. Discusses methods of preventing drift. Adhesive oils added to the concentrates reduced foliage injury and increased adherence. All kinds of foliage were covered equally well.

——— (829)
SPRAYING WOODLANDS WITH AN AUTOGIRO FOR CONTROL OF THE GYPSY MOTH. Jour. Econ. Ent. 32 (3): 381–387, illus. June 1939. 421 J822

Report on experimental work done in Massachusetts in 1936 to control *Porthetria dispar*. Advantages of the autogiro over the airplane for treating small, broken woodlands are that it can fly at slower speed, can turn in smaller area, can take off and land from smaller field, and is safer. The greater speed and loading capacity of an airplane, however, make it preferable for large, flat areas. Favorable results were obtained with concentrated mixtures of lead arsenate or calcium arsenate with water and fish-oil soap released from the autogiro. Only 5 to 10 gal. were required per acre, as contrasted with 450 to 650 gal. needed for the ordinary mixture used for ground work.

RAMSEY, H. L. (830)
THE AIRCRAFT INSECT PROBLEM. Soap and Sanit. Chem. 15 (10): 99, 101, illus. October 1939. 307.8 So12

Summarizes work on transportation of insect disease vectors and on disinfestation of planes.

RATCLIFF, J. D. (831)
IT'S POISON. CRUSHED SKULLS AND SHATTERED LEGS ARE INCIDENTALS IN THE DAY'S WORK OF THIS, THE WORLD'S MOST HAIRBRAINED AND PERILOUS PROFESSION. Collier's 103 (25): 17, 54–55, illus. June 24, 1939. Libr. Cong.

Condensed version *in* Reader's Digest 35 (210): 65–67. October 1939. Libr. Cong.

Recounts hazards faced by pilots in cotton-dusting services.

ROBINSON, B. A., and ECKERT, J. E. (832)
MR. ROBINSON ASKS ABOUT AIRPLANE 'DUSTING. Amer. Bee Jour. 79 (3): 126–127, illus. March 1939. 424.8 Am3

RUSSELL, Sir A. J. H. (833)
A NOTE ON THE YELLOW FEVER POSITION. Malaria Inst. India, Jour. 2 (2): 115–120. June 1939. 448.9 M29

Contains same information as item 834.

——— (834)
THE YELLOW FEVER POSITION. Indian Med. Gaz. 74 (3): 164–167. March 1939. Army Med. Libr.

General discussion of yellow fever situation in various countries and of efforts to prevent its introduction into India, where *Aedes* is widely distributed. All aircraft from infected or suspected areas are sprayed on arrival with Pyrocide 20 (pyrethrum diluted with kerosene), and a 9-day quarantine period established for entry of planes. Because of the fire hazard from kerosene, Imperial Airways is experimenting with a water-base pyrethrum preparation, Deskito.

SCHWEIS, G. G., BURGE, L. M., and SHOGREN, G. M. (835)
MORMON CRICKET [ANABRUS SIMPLEX] CONTROL IN NEVADA, 1935–1938. Nev. State Dept. Agr. Bul. 1/2, 48 pp., illus. Carson City, 1939. 2 N413

Airplane dusting experiment, pp. [43]–47. Five thousand acres were dusted at a cost of about 36¢ per acre. Over large areas of irregular terrain, airplane dusting is more economical, faster, and (when properly supervised) safer for livestock than hand treatment. It should not be used over small areas.

SCHWERDTFEGER, F. (836)
DIE ORGANISATION DER SCHÄDLINGSBEKÄMPFUNG IN DEN PREUSSISCHEN STAATSFORSTEN. Internatl. Kong. f. Ent., 7, Berlin, 1938. Verhandl. 3: [2132]–2148. Weimar, G. Uschmann, 1939. Natl. Mus. Libr.

Includes a discussion of the organization of airplane-dusting operations against forest insects. Cites as an example the experiments made at Tornau in June 1938 against *Panolis flammea* by the Institut für Waldschutz. Flights were made by the Luftwaffe, using a 2-motored Do23 plane.

SICÉ, A., SAUTET, J., and ETHES, Y. (837)
L'UN DES PLUS REDOUBTABLES VECTEURS DU PALUDISME EN AFRIQUE, L'ANOPHELES GAMBIAE GILES, 1902, EST-IL SUSCEPTIBLE D'ÊTRE TRANSPORTÉ EN FRANCE PAR LES AVIONS? Rev. Méd. d'Hyg. Trop. 31 (4): 137–139. July/December 1939. Natl. Mus. Libr.

Females were sent by airplane from French Sudan and received alive in Marseilles 3 days later. A new generation developed normally under normal temperatures, fed, and mated. This indicates that *A. gambiae* could become established in the Provençal region, at least during the warm weather.

THIEM, H. (838)
ZUR LAGE UND GESTALTUNG DER MAIKÄFERBEKÄMPFUNG. Internatl. Kong. f. Ent., 7, Berlin, 1938. Verhandl. 3: [2258]–2276, illus. Weimar, G. Uschmann, 1939. Univ. Ill. Libr.

*Also issued as a 20-p. preprint, Berlin, 1938.

German summary *in* Internatl. Kong. f. Ent., 7, Zusammenfassungen der Vorträge, pp. 128–129. Berlin, 1938. 422 C76, 7th

Report on laboratory and field tests with dinitro-o-cresol against *Melolontha*. Dust, containing 10 percent of the chemical, was applied over mixed forests at the rate of 36 lb. per acre in June 1938. A mortality of 93.5 percent was observed on the following day. Tests were also made with a power duster. This type of application is considered preferable for small, unconnected areas.

UNDERWOOD, F. J. (839)
YELLOW FEVER. CONFERENCE OF STATE AND TERRITORIAL HEALTH OFFICERS WITH THE PUBLIC HEALTH SERVICE. Pests 7 (7): 8–9. July 1939. 449.8 Ex8

Recommendations adopted include close cooperation between U. S. Public Health Service and various States to prevent airplane introduction of mosquitoes, and attention to mosquito control areas around airports.

WELCH, E. V. (840)
INSECTS FOUND ON AIRCRAFT AT MIAMI, FLA., IN 1938. U. S. Pub. Health Serv. Rpts. 54 (14): 561–566. Apr. 7, 1939. 151.65 P96

Also issued *as* U. S. Pub. Health Serv. Reprint No. 2053, 6 pp. 1939.

Lists insects collected from 398 seaplanes during quarantine inspections at Miami, Fla., during 1938. The planes came from Central and South America and Mexico. There were 651 insects collected, of which 166 were alive. *Musca domestica* was most prevalent. Various mosquitoes were taken but no species of *Aedes aegypti*. One-half hour before landing, the planes were sprayed with a mixture of 1 part of a standardized pyrethrum extract (2 gm. pyrethrins per 100 $cm.^3$) and 4 parts highly refined mineral oil. An airplane grounded for the night was sprayed after crew and passengers left and then was closed until morning.

WHITFIELD, F. G. S. (841)
AIR TRANSPORT, INSECTS AND DISEASE. Bul. Ent. Res. 30 (3): 365–442, illus. November 1939. 421 B87

Partial version *in* Cuba. Sec. de Sanid. y Beneficencia. Sanid. y Beneficencia 43 (7/12): 351–353. July/December 1940. 448 J827

Reviews the literature on dissemination of insects and diseases through airplane travel. Includes detailed tables showing data on insects found in planes at Khartoum, July 1935–August 1938. Control requires cooperative work of the chemist, the entomologist, the engineer, an airline-operating company, and a commercial aircraft manufacturer. The responsibility must be shared by transport, military, and private aircraft. Points requiring further research are the development of a suitable spray and of a satisfactory vaporizing apparatus. Gives general specifications for both. References, pp. 431–442.

——— (842)
INSECTS IN AIRCRAFT. Nature [London] 144 (3638): 158. July 22, 1939. 472 N21

Stresses the danger of insect transmission of disease and recommends that the proposed new air route from Africa to India and Australia should not be started until the problem of insect control in aircraft has been solved.

ZAVATTARI, E. (843)
L'AEROPLANO QUALE TRANSPORTATORE DI INSETTI VETTORI O ATTORI DI MALATTIA. Riv. di Biol. Colon. 2 (6): 425–429. December 1939. [In Italian. French, English, and German summaries, p. 429.] 442.8 R522

Refers to the studies of F. G. S. Whitfield, and states the possibility of introducing insect disease vectors into Italy via airplanes. Recommends that observations be made at the Airport of Littorio, Rome.

1940

ANONYMOUS (844)
AIRPLANE DUSTS PEAS. Wis. Agr. and Farmer 67 (14): 10, illus. July 13, 1940. 6 W751

The Central Aerial Crop Dusting Corporation, Milwaukee, treats several hundred acres with rotenone dust. Costs are given.

———. (845)
CROP-DUSTING AIRPLANE PRECAUTIONS; MAINTENANCE BULLETIN LISTS FIRE-PREVENTION PRECAUTIONS FOR CROP-DUSTING AIRPLANES. Civ. Aeronaut. Jour. 1 (9): 200. May 1, 1940. 173 C49C

Gives full text of Civil Aeronautics Authority, Airworthiness Bul. 24. Refers to the use of sulfur, which has a low ignition point.

———. (846)
FARMING TAKES TO THE AIR. Pop. Mechanics Mag. 74 (3): 371–373, 120A–121A, illus. September 1940. 291.8 P81

Crop dusting and planting.

———. (847)
INSECT QUARANTINE. PACIFIC PLANE SERVICE PROVIDES PASSAGE FOR INSECT PESTS. HAWAIIAN FARMS THREATENED. MIDWAY AND CANTON ISLANDS HAVE PEST CONTROL STATIONS. Sci. Amer. 163 (1): 13, illus. July 1940. 470 Sci25

———. (848)
STUDIES OF AERIAL ACTIVITIES OF INSECTS. Jour. Econ. Ent. 33 (4): 710. August 1940. 421 J822

Brief note of work at the Bureau of Entomology and Plant Quarantine stations at Tallulah, La., and Durango, Mexico, on airplane collection.

———. (849)
YELLOW FEVER CONTROL. U. S. HEALTH SERVICE WATCHES MIAMI CLIPPER PORT. Life 8 (22): 41–42, illus. May 27, 1940. Libr. Cong.

Excellent illustrations show disinfestation work on American Airways clipper planes.

BISHOP, E. L. (850)
COOPERATIVE INVESTIGATIONS OF THE RELATION BETWEEN MOSQUITO CONTROL AND WILDLIFE CONSERVATION. Science 92 (2383): 201–202. Aug. 30, 1940. 470 Sci2

Includes discussion of the influence of routine use of paris green, applied by airplane at rate of 1 lb. per acre, on aquatic fauna and flora.

CASSIDY, T. P., and BARBER, T. C. (851)
INVESTIGATIONS IN CONTROL OF HEMIPTEROUS COTTON INSECTS IN ARIZONA BY THE USE OF INSECTICIDES. U. S. Bur. Ent. and Plant Quar. E–506, 19 pp., illus. [Washington], 1940. [Processed.] 1.9 En83

Includes results of airplane-dusting experiments in the Salt River Valley, with detailed records for one field of short-staple cotton and one field of long-staple cotton.

DAVIES, W. W. (852)
SANITATION IN THE AIR. Soap and Sanit. Chem. 16 (8): 90–92. August 1940. 307.8 So12

Gives methods for disinfesting planes of flies, mosquitoes, cockroaches, bedbugs, etc.

GÄBLER, H. (853)
DIE KLEINE FICHTENBLATTWESPE LYGAEONEMATUS PINI RETZ. (NEMATUS ABIETINUS CHRIST., I. E. PRISTIPHORA ABIETINA (CHRIST.)) IHRE PROGNOSE UND DIE AUSSICHTEN FÜR IHRE BEKÄMPFUNG. Tharandter Forstl. Jahrb. 91 (10/12): 646–686, illus. 1940. 99.8 T32

Includes brief review of airplane-dusting experiments in 1924 and 1938. Results of ground work in 1939 demonstrated that airplane dusting would be more effective.

References, pp. 685–686.

GALLOWAY, A. G., and BURGESS, A. F. (854)
AN IMPROVED METHOD OF APPLYING INSECTICIDAL DUSTS. Jour. Econ. Ent. 33 (6): 912–915, illus. December 1940. 421 J822

Outlines experiments made from 1937 to 1939 to develop equipment for releasing dust materials in measured quantities, simultaneously but separately, so that the dust particles are coated with liquid after leaving the apparatus. Describes equipment installed in an autogiro and tests made against *Porthe-*

tria dispar. Lead arsenate was used, and the final field tests in June 1939 showed the need of further mechanical improvements to obtain a union of all dust and oil particles. However, no egg clusters were found in the plot receiving 40 lb. of poison per acre. The apparatus can be adapted to treating field or orchard crops from the ground.

GENEVRAY, J., and TRY, H. T. (855)
ÉTUDE MALARIOLOGIQUE DE LA RÉGION TONG SONTAY. Rev. Méd. Extr.-Orient 18 (9/10): 566–573, illus. November/December 1940. N. Y. Acad. Med. Libr.

Refers to the 1932 malaria outbreak among the Air Force personnel at the Tong camp in Tonkin. Airplane dusting with paris green reduced *Anopheles* larvae, and the number of cases dropped markedly. The development of Tonkin as a large industrial center in 1939 revived the danger. The results of new anopheline surveys are given, which indicate that the number of breeding places requiring treatment is not large.

GIBSON, A. (856)
CONTROLLING INSECTS FROM THE AIR—A REVIEW OF WORK CONDUCTED IN CANADA [FROM 1919 TO 1935]. Cong. Internac. de Ent., 6, Madrid, 1935 [Pub.] 2: [867]–872, illus. 1940. 422 C76

IMMS, A. D. (857)
AIR TRANSPORT, INSECTS, AND DISEASE. Nature [London] 145 (3663): 76. Jan. 13, 1940. 472 N21

Reprinted *in* Trop. Agr. [Trinidad] 17 (6): 118. June 1940. 26 T754
Refers to the work of F. G. S. Whitfield (Bul. Ent. Res. No. 30, 1939).

KEKHCHER, O. M. (858)
OPYT LIKVIDATSII MALIARIĬNOGO OCHAGA NA OZERETSKOM TORFOUCHASTKE [EXPERIMENTS IN THE ELIMINATION OF A FOCUS OF MALARIA IN THE OZERETSKOE PEAT DISTRICT]. Med. Parazitol. i Parazitar. Bolezni 9 (1/2): [12]–38, illus. 1940. [In Russian.] 448.8 M469

Various control measures, including airplane dusting of breeding places, were used against *Anopheles* mosquitoes.

LAZUK, A. D. (859)
SRAVNITEL'NYE DANNYE ÈFFEKTIVNOSTI RAZLICHNYKH SPOSOBOV DELARVATSII VODOEMOV [COMPARATIVE DATA ON THE EFFECTIVENESS OF VARIOUS METHODS OF LARVAL CONTROL IN POOLS]. Med. Parazitol. i Parazitar. Bolezni 9 (1/2): [78]–84. 1940. [In Russian. French summary, p. 84.] 448.8 M469

Results of airplane-dusting tests against *Anopheles* larvae in the Smolensk region. This method is not practicable in low-lying river areas when the district is densely populated and the mosquito breeding places small and scattered. It is very effective for large turf pits in inaccessible peat bogs. The cost, using paris green, is about ½ that of ground dusting and ⅕ that of ground spraying with crude oil.

LIZER Y TRELLES, C. A. (860)
LA LUCHA MODERNA CONTRA LA LANGOSTA EN EL PAIS. 31 pp., illus. Buenos Aires, Acad. Nac. de Agron. y Vet., 1940. 429 L76

Includes discussion of experiments made in 1939 with dinitro-o-cresol applied by airplane. The successful results warrant extensive use of this method against massed locust swarms in northern Argentina. The aircraft used should be controlled by the Ministry of Agriculture, and the organization of an aeronautical section is suggested.

MACKIE, F. P. (861)
AIR TRANSPORT, INSECTS AND DISEASE. Nature [London] 145 (3671): 391. Mar. 9, 1940. 472 N21

Refers to articles by A. D. Imms and F. G. S. Whitfield. Agrees that the control situation is unsatisfactory. Major difficulty is that the International Sanitary Convention divides responsibility among ground sanitary authorities of the various countries through which planes pass. This results in a wide diversity in type of insecticide used and in methods of application. Stresses need for a satisfactory insecticide for use against insects other than mosquitoes.

MORTON, J. S. (862)
DUSTS OF DEATH. Farm Jour. 64 (7): 24, 26, illus. July 1940. 6 F2212
Commercial crop dusting in New Jersey and Pennsylvania.

NAUDÉ, T. J. (863)
ON THE USE OF AEROPLANES IN COMBATTING INVADING SWARMS OF THE RED LOCUST [NOMADACRIS SEPTEMFASCIATA] WITH ARSENICAL DUST. Cong. Internac. de Ent., 6, Madrid, 1935 [Pub.] 2: [781]–796, illus. 1940. 422 C76

Gives detailed description of both experimental and practical work. The rapid settling of the dust cloud, when discharged from a height of 60 to 100 ft. indicates that sodium arsenite would not be successful against swarms in flight. Recommends replacing the 3-engined Hercules passenger planes used with modern multi-engined planes designed for crop dusting. The mortality among resting swarms was high, reaching a peak in about 48 hr. Recommends, for the Union of South Africa, the establishment of a locust war zone along the invasion border, with possible evacuation of grazing livestock. This would require about six planes, easily maneuverable and capable of carrying heavy loads, plus scouting planes. The cost would compare favorably with that of methods now in use.

*NAUMOV, K. (864)
CERTAIN PROBLEMS RELATING TO THE APPLICATION OF AVIOCHEMICAL WORK UNDER THE CONDITIONS OF THE CHU VALLEY IN THE KIRGHIZ SSR. Sovetsk. Zdravookhran. Kirgizii 3 (5): 52–58. 1940. [In Russian.]

Experiments were made during 1935–39 on the airplane application of dusts against *Anopheles* larvae. Defective apparatus caused large quantities of the dust to be wasted, especially when the treating of a stream or a narrow ravine made it necessary to fly at a low altitude. Aerial application was not considered practicable except over a large expanse of water. Oleoarsenite (1:4 mixture of calcium arsenite and Oleogumbrin) was inconsistent in its toxic effect. When applied at the rate of 0.9 lb. per acre, mortality varied from 75 to 100 percent. Vegetation did not cause an appreciable difference in the larval kill. Oleoarsenite remained on the surface about 30 hours, thus showing no advantage over paris green.—Abstract *in* Rev. Appl. Ent., B 33 (3): 37–38. 1945.

*NOVICHKOV, F. S. (865)
RESULTS OF EXPERIMENTS IN THE AVIOCHEMICAL CONTROL OF THE BEET WEEVIL [CLEONUS PUNCTIVENTRIS]. *In* Kulagin, N. M., and P'âtnitskiĭ, G. K. The Beet Weevil and Its Control, pp. 107–118. Moskva, Vsesoûzn. Akad. Selsk.-Khoz. Nauk Lenina, 1940. [In Russian.]

A sodium fluosilicate dust and a barium chloride spray were applied by airplane over beet fields in the Northern Ukraine. Glycerin-coated slides were used to determine the evenness of distribution. In dusting, the wind velocity should not exceed 2 m. per sec. (4½ miles per hr.); in spraying, 4 m. per sec. The width of the effective swath varied from 65 to 82 ft. for dusting, and from 32 to 38 ft. for spraying. Dust applied at the rate of either 8.2 or 10.8 lb. per acre gave a mortality of 70 to 90 percent, which compared favorably with ground results. A spray of barium chloride (15 percent solution) applied at the rate of 5 gal. per acre, gave satisfactory coverage and a percentage mortality of 70 to 90, which was as good as ground spraying at a rate of 36 gal. per acre. Airplane treatment is recommended as labor saving, more economical, quicker, more suited to beets, and as causing no injury to the plants.—Abstract *in* Rev. Appl, Ent., A 30: 64. 1942.

PORTNYKH, ÎU. P. (866)
RESUL'TATY PERVOGO OPYTNOGO OPYLIVANIÂ PIRETRUMOM LESA, ZARAZHENNOGO SOSNOVYM SHELKOPRÎADOM [RESULTS OF THE FIRST EXPERIMENTAL DUSTING WITH PYRETHRUM OF A FOREST INFESTED WITH DENDROLIMUS PINI]. Lesnoe Khoz. 1940, No. 7, pp. 65–69, illus. [In Russian.] 99.8 L562

Between April 24 and May 9, 1939, about 2½ sq. miles of a district in European Russia were dusted with ground pyrethrum flowers. When released from an airplane, the dust spread over a width of 82 ft. Since

direct sunlight decomposes the pyrethrins, evening dusting was most effective. Lower temperatures, also, which make the larvae more susceptible, were more favorable. Larval mortality increased as a general rule in proportion to the rate at which the dust was applied, and the total amount applied at one time was more effective than repeated applications at low rates. Studies were made of the effect of wind during evening flights. The author concludes that almost complete mortality of larvae is possible in May when the dust is applied at 72 to 90 lb. per acre. The amount to be used depends on weather conditions and on age of larvae. August, when the larvae are in the 2d instar, is the most favorable time.

Potts, S. F. (867)

CONCENTRATED SPRAY MIXTURES AND THEIR APPLICATION BY GROUND AND AERIAL EQUIPMENT AS COMPARED WITH STANDARD SPRAYING AND DUSTING METHODS. U. S. Bur. Ent. and Plant Quar. E–508, 21 pp., illus [Washington, D. C.], 1940. [Processed.] 1.9 En83

Gives detailed results of both field and laboratory tests. Areas are more quickly covered by the concentrated spray method, which also requires less in equipment, insecticides, and labor. It is also less expensive. Gives details of studies on various materials used and methods of preparation. The addition of a weak bordeaux mixture reduced injury to plants. Concentrated spray mixtures adhere better than ordinary sprays and are superior to dusts. Many insecticides can be stored for long periods in this form.

——— (868)

THE EFFECTIVENESS OF CONCENTRATED SPRAYS IN THE CONTROL OF CERTAIN FOREST INSECTS. U. S. Bur. Ent. and Plant Quar. E–515, 61 pp. [Washington, D. C.], 1940. [Processed.] 1.9 En83

Applications were made from ground equipment and from an autogiro. Table 2 gives details of results from autogiro tests. Insect species were increasingly resistant to the insecticides in the following order: *Anisota senatoria, Malacosoma disstria, Malacosoma americana, Diprion hercyniae,* and the cankerworms, *Alsophila pometaria* and *Paleacrita vernata.* There was no foliage injury from any mixtures used, and good results were obtained.

——— and Whitten, R. R. (869)

FURTHER TESTS WITH CONCENTRATED MIXTURES FOR AERIAL SPRAYING. Jour. Econ. Ent. 33 (4): 676–681, illus. August 1940. 421 J822

Twenty-two concentrated spray mixtures were applied by autogiro to test their practicability and to compare various spreaders, adhesives, arsenicals, and arsenical substitutes. Results were checked by feeding fresh foliage from treated plots to 4th- and 5th-instar larvae of *Anisota senatoria.* The amounts of frass passed by the larvae when fed on sprayed and unsprayed foliage was compared. Arsenicals retained their toxicity over longer periods of exposure than did the organic sprays. Nondrying oils and spreaders reduced adherence, but drying oils (fish oil) increased it. Two-tenths of a lb. of fish oil to 1 lb. of arsenical gave good results. Certain spreaders increased atomization, width of swath, and the spreading qualities. They also decreased the amount of water needed to make a fluid mixture.

Sasscer, E. R. (870)

UNDESIRABLE INSECT ALIENS. Jour. Econ. Ent. 33 (1): 1–8. February 1940. 421 J822

Includes discussion of the effect of the rapid development of aircraft transportation. There are 59 designated airports of entry for planes from foreign countries. During 1939 there were 2,445 interceptions of insects.

Schlotthauer, H. L. (871)

AIRCRAFT AS DISEASE CARRIERS. Calif. West. Med. 53 (1): 33. July 1940. Army Med. Libr.

Note on 4 unusual cases of acute illness at Muroc from bite of an insect (*Paratriatoma hirsuta*) which occurred a few weeks after arrival of military planes from South America via Panama. These insects are not previously recorded from the Mojave Desert. The illness did not resemble Chagas' disease. After a year's observation the patients showed no further symptoms and no more of the insects were reported.

*Serebrovskiĭ, A. S. (872)
O NOVOM VOZMOZHNOM METODE BOR'BY S VREDNYMI NASEKOMYMI [CONCERNING A NEW METHOD OF CONTROL OF INJURIOUS INSECTS]. Zool. Zhur. 19 (4): 618–630. 1940. [In Russian.]

Starostin, S. T. (873)
FIZIKO-MEKHANICHESKIE SVOĬSTVA INGREDIENTOV I IKH VLIÎANIE NA RABOTU AĖROOPYLENIÎA I NA KACHESTVO AVIAOPYLENIÎA ANOFELOGENNYKH VODOEMOV [PHYSICAL AND MECHANICAL PROPERTIES OF THE INGREDIENTS AND THEIR EFFECT ON AIR DUSTING AND ON THE QUALITY OF AIRPLANE DUSTING OF ANOPHELES-INFESTED WATERS]. Med. Parazitol. i Parazitar. Bolezni 9 (1/2): [71]–77. 1940. [In Russian.] Libr. Cong.

Airplane dusting was carried out in 1937 in the Province of Alma-Ata (Kazakhstan) against *Anopheles* larvae. It was found that the effectiveness of the paris green depended on the carrier used with it. Road dusts from different regions showed wide divergences in physical and chemical properties when analyzed. Those which flowed best showed little or no reduction in volume when subjected to pressure in a container. The dusts with the smallest angle of slope had the best flow. It is advisable to fly the plane evenly and avoid jolting in the take-off. The dusts should be kept dry.

Vasil'ev, V. P. (874)
MATERIALY PO ĖKOLOGII DVULETNOĬ LISTOVERTKI (CLYSIA AMBIGUELLA HUBN.) V USSR I ISPYTANIE PYLEVIDNYKH INSEKTISIDOV V BOR'BE S NEĬ [DATA ON THE ECOLOGY OF THE VINE MOTH IN THE UKRAINIAN SOCIALIST SOVIET REPUBLIC AND INVESTIGATIONS OF INSECTICIDAL DUSTS AS A CONTROL MEASURE]. Vest. Zashch. Rast. 1940, No. 3, pp. 44–53. [In Russian.] 421 P942

Various tests were made with stomach insecticides, including the airplane dusting of 21 ha. with Kupfermeritol at the Institute of Viticulture in Odessa in 1935. The dust was deposited on the grape bunches in a thin, even layer. Scorching of the leaves and bunches was not excessive, although severe damage had resulted from hand application. All varieties of grapes do not react in the same manner to the same insecticide.

References.

Walton, W. R., and Packard, C. M. (875)
THE ARMYWORM [CIRPHIS UNIPUNCTA] AND ITS CONTROL. U. S. Dept. Agr. Farmers' Bul. 1850, 11 pp., illus. Washington, D. C., 1940. 1 Ag84F

Although more expensive and less efficient than the regular baiting program, airplane dusting is feasible where a labor shortage exists. Calcium arsenate, alone or mixed with paris green, has given good results when applied at the rate of 15 to 30 lb. per acre.

Watson, R. B., and Bishop, E. L. (876)
THE CONTROL OF ANOPHELES QUADRIMACULATUS IN THE TENNESSEE VALLEY. N. J. Mosquito Extermin. Assoc. Proc. (1940) 27: 145–153. 420 N46

Airplane studies were begun in 1934, and since 1937 a larvicidal dust (22 percent paris green by volume diluted with powdered soapstone) has been applied by airplane as a routine measure. Although a practical method under favorable conditions, the authors consider that it has definite limitations and is a hazardous operation requiring skilled personnel and expensive equipment.

Welch, J. H. (877)
WHITE DEATH FROM THE AIR FOR INSECTS. Tex. Farming and Citric. 16 (10): 5–6, illus. April 1940. 80 T31

Summarizes the record of the airplane in crop pest control, including costs, efficacy, hazards, and opportunities.

Whitehead, F. E., and Fenton, F. A. (878)
AN AIRPLANE SURVEY OF GREEN BUG [TOXOPTERA GRAMINUM] INJURY IN OKLAHOMA. Jour. Econ. Ent. 33 (5): 762–768, illus. October 1940. 421 J822

Airplane surveying was tried when a serious outbreak made speed imperative. Describes appearance of infested areas from high altitudes, technique of flying, and methods of procedure and of estimating damage. The advantages of such surveys are: (1) speed, (2) greater thoroughness, (3) ability to

choose most efficient routes, (4) low cost—several cents a mile less than car surveys. Author concludes that aerial surveying provides a quick and efficient means of detecting outbreaks in early stages when they can more easily be controlled.

WILLIAMS, C. L. (879)
DISINSECTIZATION OF AIRCRAFT. U. S. Pub. Health Serv. Rpts. 55 (23): 1005–1010, illus. June 7, 1940. 151.65 P96

Reviewed *in* Jour. Trop. Med. and Hyg. 43 (15): 211–212. Aug. 1, 1940. 448.8 J827

Previous work by the U. S. Public Health Service showed that it was most satisfactory to spray the planes thoroughly at a point between South America and the United States (Port of Spain, Trinidad). Gives diagram and detailed description of a new type of sprayer, designed by H. A. Johnson and G. L. Dunnahoo, which (1) produces a fine spray, (2) prevents drip at the nozzle, and (3) permits accurate measurement of amount of spray used in each compartment of the plane. Compressed air at pressures of 25 to 40 lb. will operate the sprayer, but better results are obtained by the use of 30 to 40 lb.

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ANONYMOUS. (880)
AIR WAR ON HOPPERS. Seed World 50 (1): 13. July 4, 1941. 61.8 Se52

U. S. Bureau of Entomology bait-distribution campaign.

——— (881)
AIRPLANES AID NATIONAL FARM PROGRAM OF U. S. DEPARTMENT OF AGRICULTURE; INSECT PEST CONTROL, AIR MAPPING AMONG MANY USES. U. S. Civ. Aeronaut. Admin. Civ. Aeronaut. Jour. 2 (18): 231. Sept. 15, 1941. 173 C49C

——— (882)
COTTON GROWERS MAKE $9 AN ACRE FROM AIRPLANE DUSTING. Ariz. Farmer 20 (14): [1]–2. July 5, 1941. 6 Ar44

Beneficial results of airplane work against *Lygus* and pentatomid bugs.

——— (883)
CRICKET BLITZ. Time 38 (5): 56. Aug. 4, 1941. 280.8 T

Airplane distribution of bait.

ADAMSON, A. M. (884)
THE GEOGRAPHICAL DISTRIBUTION OF INSECT PESTS. Trop. Agr. [Trinidad] 18 (3): 43–47. March 1941. 26 T754

Air transport, p. 46.

BECKWITH, C. S. (885)
CONTROL OF CRANBERRY FRUIT WORM [MINEOLA VACCINII] ON BLUEBERRIES. Jour. Econ. Ent. 34 (2): 169–171. April 1941. 421 J822

Airplane applications of pyrethrum dust (Pyrocide 10 percent) were made over two fields on May 29 and June 6, using 30 lb. of poison each time. The number of larvae on the fruit when harvested was reduced 94 percent.

CASSIDY, T. P., and BARBER, T. C. (886)
FURTHER RESULTS FROM AIRPLANE DUSTING IN ARIZONA FOR HEMIPTEROUS COTTON INSECT CONTROL, CROP SEASON OF 1940. U. S. Bur. Ent. and Plant Quar. E–543, 8 pp. Washington, D. C., 1941. [Processed.] 1.9 En83

Dust should be applied at the rate of 15 lb. per acre whenever 12 or more mirids (*Lygus*, etc.) can be collected for each 100 sweep-net strokes, or when at least 6 pentatomid bugs can be found on examination of 100 plants. A mixture of 7½ percent paris green and 92½ percent dusting sulfur is recommended. The experiments show that such treatment will permit a reasonable profit to be made.

HARGETT, M. V. (887)
LES MOUSTIQUES DANS LES AÉRONEFS. Off. Internatl. d'Hyg. Pub. [Paris], Bul. Mens. 33 (5/6): [279]–287. May/June 1941. 449.75 Of2

Shows need for effective antimosquito measures on inter-American lines. Describes means by which mosquitoes may enter planes and the Florida

work with pyrethrin solutions. Outlines advantages and disadvantages of disinfestation before, during, and after flights. Describes a method of disinfestation using atomized pyrethrum sprays.
References.

HILLS, O. A., and ROMNEY, V. E. (888)
A METHOD OF SIMULATING AIRPLANE APPLICATION OF INSECTICIDES TO TALL PLANTS IN EXPERIMENTAL PLOTS. Jour. Econ. Ent. 34 (6): 853–856, illus. December 1941. 421 J822
Describes apparatus and technique.

HINMAN, E. H., STEENIS, J., KING, W. V., ROBERTSON, J. L., JR., WIEBE, A. H., TARZWELL, C., and HESS, A. D. (889)
ADDITIONAL COOPERATIVE STUDIES OF THE RELATION BETWEEN MOSQUITO CONTROL AND WILDLIFE CONSERVATION. Science 94 (2428): 44–45. July 11, 1941. 470 Sci2
Experimental work was done in the Tennessee Valley with airplane application of sodium arsenite at monthly intervals (about 8 lb. per acre) to reduce vegetation and thus increase effectiveness of mosquito larvicides. Results were encouraging.

HIXSON, E. (890)
THE WALNUT DATANA [DATANA INTEGERRIMA]. Amer. Pecan Jour. 1 (12): 12–15, illus. September 1941. 94.68 Am3
Preliminary tests were made in a pecan grove of the Oklahoma Department of Horticulture on the application of calcium arsenate by plane. Twenty pounds per acre with the plane flying at a height of about 25 ft. above tree tops gave excellent coverage. Larval mortality could not be accurately estimated because prevailing high temperatures were fatal to many young larvae. A yield of 33 lb. per acre would be required to make airplane economically justifiable.

——— (891)
THE WALNUT DATANA [DATANA INTEGERRIMA]. Okla. Agr. Expt. Sta. Bul. 246, 29 pp., illus. Stillwater, 1941. 100 OK4
Tests carried out in a pecan grove of the Oklahoma Department of Horticulture showed the feasibility of applying calcium arsenate by airplane. The dust was used at the rate of 20 lb. per acre from a plane flying 25 ft. above the tree tops. Each 20-lb. dusting costs $2 per acre, and the method is only recommended when the price received for the crop warrants the expenditure.

*KOROTKIKH, G. I. (892)
THE QUALITY OF INSECTICIDES AND THEIR PACKING. Zhur. Khim. Promysh. 18 (5): 15–17. February 1941.
In 1940 control of Siberian spinning caterpillars (*Dendrolimus sibiricus*) was carried out over 6,746 ha. of forests. Na_2SiF_6 powder (particle size 17μ), when scattered at the rate of 15 kg. per ha., effected 90-percent mortality. Calcium and sodium arsenites in 10-percent solution gave only 70-percent mortality. It is very important that the insecticides should not be too densely packed, and should be placed in containers of not too large a size inert towards the poison.—Abstract *in* Chem. Abs. 38 (13): 3409. 1944; Chem. Zentbl. 114 (2): 200. 1943.

NATIONAL RESEARCH COUNCIL. COMMITTEE ON APPARATUS IN AEROBIOLOGY. (893)
TECHNIQUES FOR APPRAISING AIR-BORNE POPULATIONS OF MICROORGANISMS, POLLEN, AND INSECTS. Phytopathology 31 (3): 201–225, illus. March 1941. 464.8 P56
Includes airplane trap collection.
References.

SCHWERDTFEGER, F. (894)
BEKÄMPFUNG UND PROGNOSE DER KIEFERNSCHONUNGS-GESPINSTBLATTWESPE, ACANTHOLYDA ERYTHROCEPHALA L. Forstarchiv 17: 57–61. 1941. 99.8 F7723
After young pine stands in a district east of Schwerin in Posen had been

seriously damaged, the larvae were completely exterminated by airplane dusting with arsenicals. Fifty kg. of poison were used per hectare. A method of forecasting based on a count of larvae and eggs is recommended.

——— (895)
PROGNOSE UND BEKÄMPFUNG FORSTLICHER GROSSSCHÄDLINGE. 194 pp. Berlin, Reichsnährstands Verlag, 1941. 423 Sch93P

Includes detailed account of general principles of airplane dusting. Gives a table which shows trade name of the dust, manufacturer, toxic substance, type of action, and insects against which it is effective. Reviews the organization and technique of dusting operations, including dosages required for different types of forest, effect of weather conditions, costs, and safety measures.

SMITH, E. C. (896)
COTTON DUSTING, FAST AND FURIOUS. Prog. Farmer, Miss. Val. Ed. 56 (6): 11, illus. June 1941. 6 So81

Brief summary of dusting methods against *Anthonomus grandis*.

TONTZ, C. (897)
AIRPLANES HUNT DOWN THE GREENBUGS [TOXOPTERA GRAMINUM]. Farmer-Stockman 54 (2): 38. Jan. 15, 1941. 6 Ok45

Aerial survey of infestation in Oklahoma counties.

UNITED STATES BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE. (898)
DEVICES FOR INSECT CONTROL. U. S. Bur. Ent. and Plant Quar. Insects in Relat. to Natl. Defense. Cir. 20, 56 pp., illus. Washington, D. C., 1941. 1.967 A2In7

Airplane Spraying and Dusting, pp. 40–42. Describes essential features of equipment with diagram of hopper and Venturi tube.

UNITED STATES FOREST SERVICE. (899)
USE OF AIRCRAFT IN FORESTRY. Pulp and Paper Mag. Canada 42 (6): [371]–373, illus. May 1941. Libr. Cong.

Insect control, pp. 372–373.

VAN ZWALUWENBURG, R. H. (900)
CANTON ISLAND. Hawaiian Planters' Rec. 45 (1): 15–24, illus. First quarter 1941. 25 H311

Canton Island is important as a quarantine station for the interception of undesirable insects. It is unique in having almost no mosquitoes, and maintenance of this condition depends on vigilance of flight stewards who disinfest the planes.

WALKER, H. G., and ANDERSON, L. D. (901)
CONTROL OF THE CORN EARWORM [HELIOTHIS ARMIGERA] ON BROCCOLI. (Scientific note) Jour. Econ. Ent. 34 (2): 325–326. April 1941. 421 J822

The entire crop was dusted by airplane with undiluted calcium arsenate applied at the rate of 25 lb. per acre. Control was good, but for a period of 10 days after dusting it was necessary to wash the plants to remove arsenical residues. The amount of residue might vary greatly under different weather conditions.

——— and ANDERSON, L. D. (902)
RESULTS OF TESTS FOR THE CONTROL OF THE PEA APHID [MACROSIPHUM PISI] IN EASTERN VIRGINIA. Peninsula Hort. Soc. [Del.] Trans. (1940) 54: 30–35. [1941.] 81 P37

Includes statement that the little airplane work done in Virginia proved unsatisfactory.

WHITFIELD, F. G. S. (903)
LA LUTTE CONTRE LES INSECTES DANS LES AÉRONEFS. NÉCESSITÉ DES RECHERCHES SUR CETTE QUESTION. Off. Internatl. d'Hyg. Pub. [Paris], Bul. Mens. 33 (5/6): [288]–297. May/June 1941. 449.75 Of2

Lists types of insects likely to be transported by plane and discusses their importance as vectors of animal and human disease or as potential agricultural pests. Reviews protective measures and points out increased dangers due to wartime conditions.

WHITTEN, R. R., POTTS, S. F., and FRANCIS, E. H. (904)
CONCENTRATED SPRAY APPLIED WITH AN AUTOGIRO FOR CONTROL OF CANKERWORMS. Jour. Econ. Ent. 34 (5): 692–696, illus. October 1941. 421 J822

In 1936 and 1937 tests were made against *Paleacrita vernata* and *Alsophila pometaria* in the National Historical Park, Morristown, N. J. The insecticides used were: (1) a concentrated spray mixture of lead arsenate, fish oil, paraffin oil, and water: (2) a dust of lead arsenate impregnated with paraffin oil; (3) a proprietary colloidal lead arsenate spray. The concentrated spray caused a marked reduction in the amount of feeding, and the autogiro compared favorably with the truck-drawn sprayer. The cost per acre was less. An appreciable degree of control was obtained with the dust, but difficulty was experienced in regulating the drift.

1942

ANONYMOUS. (905)
DUSTING PLANES MADE AVAILABLE FOR 1942 CROP. AUTHORITIES RULE DUSTERS ARE FARM MACHINERY NEEDED IN INSECT CONTROL. Natl. Cotton Council Amer. Prog. Bul. Gen. Bul. 26, pp. 1, 8. Apr. 15, 1942. 281.3729 N212P

Refers to action taken by the Civil Aeronautics Administration, the Selective Service System, and the War Production Board.

——— (906)
PLANES AND PILOTS. Business Week, No. 661, p. 64. May 2, 1942. 280.8 Sy8

Cotton dusting suffers from shortage of pilots, planes, and insecticides.

——— (907)
U. S. LEADERSHIP IN HEALTH PROTECTION. Science 96 (2497, sup.): 10. Dec. 6, 1942. 470 Sci2

Brazil complains that *Aedes aegypti* and *Glossina* spp. have been found on American planes entering Brazil from Africa. Report of Dr. Thomas Parran at the St. Louis meeting of the U. S. Public Health Service.

AVEROLDI, O. L. (908)
O AEROPLANO EM BREVE SERÁ O MEIO MAIS EFICAZ NO COMBATE ÀS PRAGAS DA LAVOURA. Sitios e Fazendas 7 (12): 5–8, illus. December 1942. 9.2 Si8

BUTLER, E. (909)
ATTACKING BOLL WEEVIL [ANTHONOMUS GRANDIS] FROM THE AIR. Prog. Farmer, Tex. Ed. 57 (11): 8, 58, illus. November 1942. 6 T311

Reprinted *in* Acco Press 20 (11): 7–8. November 1942. 6 Ac2

Popular account of cotton dusting by airplane in the Brazos Bottoms.

DOVE, W. E. (910)
CONTROL OF DESTRUCTIVE INSECTS BY AIRCRAFT. Sci. Monthly 55 (4): 382–386, illus. October 1942. 470 Sci23

Summarizes the development of the use of aircraft in the United States for scouting, dusting, and baiting, and concludes that this method is now an important factor in preventing the losses caused by insects.

DUNNAHOO, G. L. (911)
THE CONTROL OF INSECTS TRANSPORTED BY AIRCRAFT. Fla. Anti-Mosquito Assoc. Rpt. (1942) 16: 10–13. [Processed.] 420 F663

Reviews the development of aircraft disinfestation work and analyzes results of inspections at Miami from 1939 through February 1942. During this period 1,137 planes were inspected and 258 mosquitoes recovered and identified. Only one specimen (dead) of *Aedes aegypti* was collected. The author concludes that, considering the habits of *A. aegypti*, there is little danger of introducing infected individuals if the present disinfestation methods are continued and perfected.

Discussion by David B. Lee, pp. 14–16.

GLASGOW, H. (912)
THE USE OF CONCENTRATED SPRAYS FOR PEA APHID [MACROSIPHUM PISI] CONTROL. N. Y. State Agr. Expt. Sta. Bul. 698, pp. 12–14. Geneva, 1942. 100 N48

Airplane application of concentrated sprays was not considered satisfactory, but tests with ground equipment were favorable.

GLICK, P. A. (913)
INSECT POPULATION AND MIGRATION IN THE AIR. Amer. Assoc. Adv. Sci. Pub. 17 (Aerobiology), pp. 88-98, illus. 1942. 442 Am3A

Describes the 1926/31 work of the U. S. Bureau of Entomology and Plant Quarantine on airplane trap collection, factors affecting aerial populations, economic and scientific importance, aircraft in relation to insect distribution, and the relation of insects to disease (especially allergy).
References.

GRECHKA, D. I., and BEL'SKAÎA, M. K. (914)
PRIMENENIE MYSH'ÎAKOVISTOĬ GRÎAZI DLÎA BOR'BY S LICHINKAMI ANOFELESA [UTILIZATION OF ARSENIOUS SLUDGE FOR THE CONTROL OF ANOPHELES LARVAE]. Med. Parazitol. i Parazitar. Bolezni 11 (1/2): 25–27. 1942. [In Russian.] Army Med. Libr.

Describes experiments conducted by the Ukrainian Institute of Malaria and Medical Parasitology in 1938 to discover effective larvicidal substitutes for paris green and calcium arsenite. Laboratory work with arsenical waste products of chemical factories was carried out in the Khar'kov region. The sludge, which is dried into a powder with particles of from 10 to 50μ in diameter contains 10.6 percent arsenic trioxide and 7.8 percent arsenic pentoxide. In aerial dusting near the city of Zmiev no poisoning to animals or birds resulted. Best results were obtained by the addition of 2 percent of petroleum for airplane dusting. A dosage of 1 to 1.5 kg. per ha. is recommended for open pools and of 1.5 to 2 kg. per ha. where vegetation is present.

ITZEROTT, H. (915)
DIE MAIKÄFERBEKÄMPFUNG 1942 IM ALTMÜHLTAL. Mitt. f. die Landw. 57 (40): 703–704, illus. Oct. 3, 1942. 18 D48M

Experiments against *Melolontha* spp. were carried out in May 1942 in the Altmühl Valley using both ground and air equipment. For airplane treatment a dinitro-o-cresol dust (Borchers' K III) was used at the rate of about 127 kg. per ha. Results were successful and a more extensive use of the airplane is recommended for the following year. Dinitro-o-cresol should be handled in such a manner as to avoid toxic effects to man and animals. Bees are especially sensitive to this insecticide.

JACKSON, W. P. (916)
THE AIRPLANE, A POSSIBLE MEANS OF TRANSMISSION OF DISEASE. Va. Med. Monthly 69 (1): 29–34. January 1942. 448.4 V59

Insect vectors of disease may be carried by airplane, and new routes to the Tropics and Subtropics have greatly increased the danger. Summarizes previous work.
Discussion, pp. 34–35.

——— (917)
THE POSSIBLE DANGERS OF TRANSMISSION OF DISEASE BY AIRPLANE. U. S. Bur. Med. and Surg. U. S. Nav. Med. Bul. 40 (1): 115–123. 1942. 153.45 Un3

Discusses role of the airplane in the spread of insect-borne disease. Recommends greater care in inspection and disinfestation of planes and cargoes.
References.

NABOKOV, V. A., and ZAV'ÎALOV, A. P. (918)
NEKOTORYE ORGANIZAT͡SIONNYE OSOBENNOSTI BOR'BY S LICHINKAMI MALÎARIĬNYKH KOMAROV NA VODOOKHRANILISHCHAKH [SOME POINTS IN THE ORGANIZATION OF CONTROL OF ANOPHELINE LARVAE IN RESERVOIRS]. Med. Parazitol. i Parazitar. Bolezni 11 (1/2): 6–8. 1942. [In Russian.] Army Med. Libr.

Describes the formation of artificial reservoirs in which mosquitoes breed, and advocates careful planning of operations in various localities. In order

to prevent waste of insecticides and needless expense, the airplane method should be restricted to otherwise inaccessible places and only used after a thorough investigation. In many places boats equipped with ground apparatus may prove most effective.

PEMBERTON, C. E. (919)
ENTOMOLOGY. REPORT. Hawaiian Sugar Planters' Assoc. Com. Charge Expt. Sta. Rpt. 1940/41: 21–27. *In* Hawaiian Sugar Planters' Assoc. Ann. Mtg. (1941) Rpt. 61. Honolulu, 1942. 65.9 H314

Quarantine—Project E–9, pp. 25–26. Refers to inspection of airplanes.

SALMONSEN, E. M. (920)
AIRPLANES VERSUS TRANSMISSION OF DISEASE. Jour. Aviation Med. 14 (3): 222–223. September 1942. Libr Cong.

John Crerar Library, Reference List No. 50, Chicago, Ill., 1942.

SERGIEV, P. G., and ĪAKUSHEVA, A. I. (921)
BOR'BA S MALĪARIEĬ V SSSR [MALARIA CONTROL IN THE U. S. S. R.]. Med. Parazitol. i Parazitar. Bolezni 11 (6): 3–10. 1942. [In Russian.] 448.8 M469

Historical review of malaria-control work in the Soviet Union, including an account of airplane dusting with paris green. In 1929, 100 ha. were dusted; in 1938, 3,500,000 ha.

SULLIVAN, W. N., GOODHUE, L. D., and FALES, J. H. (922)
TOXICITY TO ADULT MOSQUITOES OF AEROSOLS PRODUCED BY SPRAYING SOLUTIONS OF INSECTICIDES IN LIQUEFIED GAS. Jour. Econ. Ent. 35 (1): 48–51, illus. February 1942. 421 J822

The aerosols are not toxic to man, are not inflammable, are easy to apply, and do not stain. These qualities should make them suitable for use against mosquitoes on airplanes.

THIEM, H. (923)
UEBER WEITERE ERFAHRUNGEN ZUR CHEMISCHEN BEKÄMPFUNG DER MAIKÄFER [MELOLONTHA SPP.]. Anz. f. Schädlingsk. 18 (2): 16–19. 1942. 421 An9

Dinitro-o-cresol is an effective contact insecticide and also acts as a stomach poison at low concentrations. Power dusters are more efficient as distributors than airplanes are.

UNITED STATES CIVIL AERONAUTICS ADMINISTRATION. (924)
SAFETY REGULATION RELEASE NO. 89. 5 pp. [Washington, D. C.] Jan. 19, 1942. Natl. Advisory Com. for Aeronaut. Libr.

Causes and prevention of fire occurring while engaged in spreading sulfur dust with aircraft.

UNITED STATES CIVIL AERONAUTICS BOARD. SAFETY BUREAU. (925)
INDIVIDUAL ACCIDENT REPORTS. STALL DURING CROP DUSTING. Civ. Aeronaut. Jour. 3 (1): 8. Jan. 1, 1942. 173 C49C

Report on an accident in which the pilot, F. P. Lawrence, Jr., was seriously injured while dusting a tomato field near Matamora, Ohio. Analyzes the accident and concludes that the probable cause was a stall during a steep turn at low altitude. Malfunctioning of the dust-releasing mechanism is given as a contributing factor.

UNITED STATES PUBLIC HEALTH SERVICE. (926)
QUARANTINE LAWS AND REGULATIONS OF THE UNITED STATES, AND INTERNATIONAL TREATIES APPLICABLE TO INTERNATIONAL AERIAL NAVIGATION 37 pp. Washington, D. C., U. S. Govt. Print. Off., 1942. Natl. Inst Health Libr.

Cites regulations for quarantine, inspection, and disinfestation of aircraft.

UPHOF, J. G. (927)
EL AEROPLANO EN LA LUCHA CONTRA LOS INSECTOS Y ENFERMEDADES DE LOS VEGETALES. Hacienda 37 (5): 192–193, illus. May 1942. 6 H11

Abridged version *in* Chacra 12 (144): 20, 22, illus. October 1942. 9 C34

Reviews use of the airplane in crop dusting and mosquito control.

WEBB, J. L. (928)
COTTON OR BOLL WEEVILS [ANTHONOMUS GRANDIS]. U. S. Dept. Agr. Misc. Pub. 484, 16 pp., illus. Washington, D. C., 1942. 1 Ag84M

Airplane dusting, pp. 12–13.

*WELLENSTEIN, G., MORS, H., MITSCHERLICH, H., and others. (929)
DIE NONNE [LYMANTRIA MONACHA] IN OSTPREUSSEN (1933–1937). FREILANDSTUDIEN DER WALDSTATION FÜR SCHÄDLINGSBEKÄMPFUNG IN JAGDHAUS ROMINTEN. Monog. z. Angew. Ent. 15, 698 pp., illus. Berlin, Paul Parey, 1942.

Partial contents: Die Entwickling der Flugzeugbekämpfung in technischer Hinsicht, by J. Reier; Zur Frage der Kennzeichnung von Flugfeldern bei der Forstbestäubung, by G. Wellenstein; Die Wirkung der Nonnenbegiftung auf die Kerbtierwelt, by O. F. Niklas; Folgeerscheinungen der Gift bestäubung auf die höheren Tiere und die Pflanzenwelt, by O. Steinfatt and G. Wellenstein.

WEYER, F. (930)
DIE BEDEUTUNG DES FLUGZEUGES IM DIENSTE DER STECHMÜCKEN BEKÄMPFUNG. Flughäfen 10 (1): 8–13, illus. January 1942. Libr. Cong.

Describes control methods used before the introduction of the airplane. Planes are used to spot breeding places and to apply poisonous dusts. Gives an account of successful airplane dusting in the United States and other countries.

WINTERS, S. R. (931)
BUG HUNTERS. Flying 30 (4): 35–36, 106, 113. April 1942. Libr. Cong.
Condensed versions appear under title "Chasing Bugs with Airplanes" *in* Sci. Digest 12 (2): 70–72. August 1942. Libr. Cong.; *and* Farm and Ranch Rev. 38 (10): 11. October 1942. 7 F223

Describes studies made by the U. S. Department of Agriculture on aerial dissemination of crop pests. Collections were made over the Lower Mississippi Valley by means of traps attached to airplanes.

1943

ANONYMOUS. (932)
DAS FLUGZEUG IM DIENSTE DER SCHÄDLINGSBEKÄMPFUNG. Flughäfen 11 (1): 7–10, illus. January 1943; (2): 8–13, illus. February 1943. Libr. Cong.

Traces development of insecticides used in airplane control of various forest insects (*Lymantria monacha, Panolis flammea*, etc.) and discusses superiority of "Detal." It is not affected by weather conditions and is toxic to all stages of larvae.

ARMITAGE, H. M. (933)
POSSIBLE ECONOMIC RELATIONS OF THE HAWAIIAN INSECT FAUNA TO CALIFORNIA AGRICULTURE. Pan-Pacific Ent. 19 (1): 1–11. January 1943. 421 P193

Stresses the increased danger of introducing injurious crop pests through the development of speedy airplane traffic. Discusses most potentially dangerous pests. References.

BOLTEN, J. (934)
THE PREVENTION OF MALARIA AMONG THE MILITARY FORCES IN PUERTO RICO. Asoc. Med. de Puerto Rico. Bol. 35 (3): 89–96. March 1943. Natl. Inst. Health Libr.

Includes discussion of airplane dusting experiments to control breeding of *Anopheles* in inaccessible places (mangrove swamps, etc.). The drawbacks are lack of proper equipment, of trained personnel, and of larvicidal dust. The dust situation is further complicated by the fact that airplane mixtures require 15 to 30 percent paris green as against 2 to 10 percent for hand dusters.

BRAZIL. LAWS, STATUTES, ETC. (935)
DECRETO—LEI N. 5,181—DE 11 DE JANEIRO DE 1943, DISPÕE SOBRE O TRANSPORTE DE ARTRÓPODES VIVOS POR AERONAVES E DA OUTRAS PROVIDENCIAS. Diário Oficial [Brazil] 82 (10, Secc. 1): [449], 451. Jan. 13, 1943. Libr. Cong.

Prescribes measures to insure that aircraft do not act as a means of introducing injurious insects into Brazil from Africa, or other areas specified by the Departamento Nacional de Saude. Sanitary authorities must be notified of aircraft arrivals from Africa as long in advance as they may require. Aircraft must be rigorously disinfested before passengers or luggage are unloaded. Records must be kept of the time and method of disinfestation. Aircraft must be completely closed before landing, and the air-conditioning apparatus must not operate during disinfestation. Aircraft must be inspected for living arthropods after disinfestation is completed. Penalties are stated.

Abstract *in* Bul. Hyg. [London] 18 (5): 351. May 1943. 448.8 B87. Apparently from text printed *in* Correio da Manhã [Rio de Janeiro] 42 (14,782): 3. Jan. 10, 1943. Libr. Cong.

BROWN, A. C. (936)
DIFFICULTIES OF INSPECTION FOR PLANT PESTS UNDER WAR-TIME CONDITIONS. Fla. State Hort. Soc. Proc. (1943) 56: 81–85. 81 F66

Also *in* Citrus Indus. 24 (8): 3, 10–11, 14. August 1943. 80 C49

Emphasizes need for adequate inspection to prevent entry of foreign pests on plants and plant products brought into this country by aircraft, especially those operated by our armed forces.

——— (937)
REPORT OF THE QUARANTINE INSPECTION DEPARTMENT JULY 1, 1940—JUNE 30, 1942. Fla. State Plant Bd. Bien. Rpt. (1940/42) 14: 16–[20]. 1943. 464.9 F662R

Cites work done in checking airplanes, both commercial and service, together with passengers' baggage, mail, and express. Results justify fear that fruit flies and other pests may be introduced by means of airplanes.

CARMELIA, F. A. (938)
PUBLIC HEALTH PROBLEMS IN INTERNATIONAL AERIAL TRANSPORTATION. Pacific Sci. Cong., 6, 1939, Proc. 6: 29–35. Berkeley, Univ. Calif. Press, 1943. 330.9 P194

The *Aedes* and *Anopheles* vectors of yellow fever and malaria are indigenous to the United States. Aerial transportation has brought centers of infestation in other countries close to our shores. Gives detailed lists of protective measures to be observed at ports of departure, during flight, at ports of call en route, and at ports of destination.

COGGESHALL, L. T. (939)
MALARIA CONTROL ALONG AN AIR ROUTE THROUGH AFRICA. N. J. Mosquito Extermin. Assoc. Proc. (1943) 13: 32–38. 420 N46

"Malaria was the outstanding medical problem of the airline." *Anopheles gambiae* is indicated as principal vector. Recognized measures, if energetically and continuously applied, will keep the disease under control. Otherwise all activities may be brought to a standstill.

DAUBERSCHMIDT. (940)
SCHÄDLINGSBEKÄMPFUNG DURCH FLUGZEUG-VERNEBELUNG. Forstwiss. Centbl. u. Tharandter Forstl. Jahrb. No. 6, pp. 247–259. December 1943. 99.8 F775

Preliminary experiments in spreading an insecticidal fog by airplane were made by the Luftwaffe in June 1942 over forest areas in Neuburg, Bayern. The material used was a mixture of sulfur trioxide and chlorosulfonic acid. Favorable results indicated the advisability of further tests. Fog substances require less plane space and will permit the use of faster machines of a smaller, less complicated design.

DUGAS, A. L. (941)
DUSTING WITH CRYOLITE PROVES A SUCCESSFUL CONTROL FOR THE SUGARCANE BORER [DIATRAEA SACCHARALIS]. La. Agr. Expt. Sta. Rpt. 1942/43: 68–71. 100 L93

Cryolite applied by plane, ground machine, and handgun resulted in an increase of 20 to 30 lb. of sugar per ton of cane. The average cost of ground work was about $5 per acre; of plane, about $6.50. The difference is negligible when set against the many advantages of plane application. A high toxicity was shown by both natural and synthetic cryolite, the effectiveness depending on the dusting properties. Some attention should be given to a slight increase in sugarcane aphid populations after the 1943 operations.

DUNNAHOO, G. L. (942)
INSECT CONTROL ON AIRCRAFT. Soap and Sanit. Chem. 19 (2): 111, 113. February 1943. 307.8 So12

Lists results of inspections at Trinidad, Maracaibo, and Barranquilla and recommends the use of pyrethrum aerosols in plane disinfestation.

FOSDICK, R. B. (943)
PRESIDENT'S REVIEW. Rockefeller Found. Ann. Rpt. 1943: 5–40. 500 R592

The Gambiae Mosquito Comes Back, pp. 17–19. Discusses report that *Anopheles gambiae* had been brought back to Brazil by a plane from Africa, and stresses need for international supervision of airplane traffic.

GORDON, W. M. (944)
AIRPLANE RUNWAYS DAMAGED BY ANTS. Jour. Econ. Ent. 36 (2): 354. April 1943. 421 J822

Damage by *Pogonomyrmex barbatus* var. *molefaciens* at several auxiliary naval air stations near Corpus Christi, Tex. Carbon disulfide or granulated calcium cyanide was poured into the nests.

——— (945)
MAKING MOSQUITO SURVEYS WITH A JEEP AND THE PBY–5. Science 97 (2529): 555. June 18, 1943. 470 Sci2

The patrol bomber (PBY–5) has "glass blisters" in the fuselage, which make it possible to survey the ground in all directions. Its ability to fly at low speeds facilitates sketch mapping.

GREAT BRITAIN DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH. (946)
FOREST PRODUCTS RESEARCH BOARD.
RECOGNITION OF DECAY AND INSECT DAMAGE IN TIMBERS FOR AIRCRAFT AND OTHER PURPOSES. 18 pp., illus. London, His Majesty's Stationery Off., 1943. 423 G7925

Contents: Pt. I. Notes for the Use of Timber Inspectors; Pt. II. List of Certain Timbers in General Use, with Notes on Their Resistance to Decay and Insect Attack.

HARTMAN, C. W. (947)
THE DANGERS OF AIRPLANE DUSTING. Amer. Bee Jour. 83 (11): 421. November 1943. 424.8 Am3

Cites damage from indiscriminate application of insecticides, and quotes statement furnished by Dr. J. E. Eckert.

HUSMAN, C. N. (948)
A HOPPER AND MECHANISM FOR DISTRIBUTION OF BAITS AND DUST BY AIRPLANES FOR INSECT CONTROL. U. S. Bur. Ent. and Plant Quar. ET–212, 6 pp., illus. Washington, D. C., 1943. [Processed.] 1.9 En83ET

Description accompanied by 7 diagrams, showing apparatus and method of attachment.

INGRAM, J. W., BYNUM, E. K., HALEY, W. E., and CHARPENTIER, L. J. (949)
AIRPLANE DUSTING OF SUGARCANE WITH SYNTHETIC CRYOLITE FOR CONTROL OF SECOND-GENERATION BORERS. Sugar Bul. 21 (17): 129–131. June 1, 1943. 65.9 Am32

Report on experiments carried out in Louisiana in 1942. Second-generation borers of *Diatraea saccharalis* appear late in June when the cane is too high and the ground apt to be too muddy for satisfactory use of ground

machinery. In the three experiments a total of 742 acres was dusted. The planes flew 3 to 5 ft. above the cane and laid a dust swath 30 ft. wide. All work was done in the early morning. Comparative tests were made with handguns, and results were gauged by examination of 100 stalks cut from each dusted and each check area 3 weeks after dusting and again at harvest time. Tables are given. In these tests airplane dusting proved fully as effective as ground dusting against second-generation borers.

LEIKIND, M. C. (950)
ESTAÇÃO DE QUARENTENA DE MIAMI, FLÓRIDA. Actas Ciba [Rio de Janeiro] 10 (1/2): 29–36, illus. January/February 1943. Army Med. Libr.

Inspection and disinfestation of clipper planes coming from South America to Miami. Illustrations are interesting.

LUMLEY, G. F., and TAYLOR, F. H. (951)
DENGUE. PART I–II. Sydney. Univ. School Pub. Health and Trop. Med. Serv. Pub. 3, 171 pp., illus. Glebe, N. S. Wales, 1943. 448.9 Sy2

Includes survey of the factors that affect abundance of *Aedes aegypti*. Risk of aerial transport is dealt with on pp. 132–134.

MCINTIRE, R. T. (952)
DISINSECTIZATION OF AIRCRAFT. (U. S. BUREAU OF MEDICINE AND SURGERY. FORM LETTER NO. 28.) Contact [Naval School of Aviation Medicine, Pensacola, Fla.] 2 (4): 117–118. May 1, 1943. Libr. Cong.

MUNSON, D. H. (953)
DIXIE DUSTERS. Flying 32 (3): 84, 98, 100, illus. March 1943. Libr. Cong.

Reviews briefly the history of airplane dusting for the control of *Anthonomus grandis* and other cotton insects. A pilot attached to a commercial dusting service receives an average of $300 per mo. plus a bonus of a penny an acre. A good day's work is 600 acres, about 100 acres being covered in 12 to 15 min. Hazards of low flying and danger of fire make the death rate rather high. Firms choose their men as carefully as the Army selects its pilots. It takes three full seasons' experience to develop a good duster pilot.

POOS, F. W. (954)
CONTROL OF HAY INSECTS IN THE EASTERN UNITED STATES. 12 pp. [Washington, D. C.] U. S. Bur. Ent. and Plant Quar. [1943. Processed.] 1.967 C2C76

Cites successful use of calcium arsenate (alone or mixed with paris green) against *Cirphis unipuncta*, p. 4.

SCHEDL, K. E. (955)
DER FORSTLICHE PFLANZENSCHUTZ IN DER UKRAINE. Forstarchiv 19 (3/8): 85–95. Mar. 15, 1943. 99.8 F7723

Includes discussion of calcium arsenite, sodium fluosilicate, and pyrethrum as materials for use in airplane dusting.

SMITH, F. (956)
LITTLE KNOWN FLIGHTS BY WORKADAY AIRMAN, MOSQUITO BOMBER CIRCA 1932. U. S. Air Serv. 28 (3): 15, 52. March 1943. Libr. Cong.

Refers to pilot who flew plane used in first mosquito-control work around Quantico, Va.

SOPER, F. L., and WILSON, D. B. (957)
ANOPHELES GAMBIAE IN BRAZIL 1930 TO 1940. 262 pp., illus. N. Y., Rockefeller Found., 1943. 428 So6

Authors believe that the mosquitoes which originated the infestation discovered at Natal in 1930 were brought from Africa on fast French destroyers, rather than by airplanes. Aircraft are, however, a potential source of infestation; their disinfestation is discussed on pp. 136–141. Table 18 lists the arthropods collected from planes arriving in Brazil by way of Africa. Prevention of transfer of disease vectors is also dealt with on pp. 227–229. References, pp. 248–253.

STETSON, D. (958)
LA TECNICA EFICAZ DE LA SEABROOK EN LA PRODUCCIÓN DE ALIMENTOS AYUDA A GANAR LA GUERRA. Hacienda 38 (1): [10]–[14], 18, illus. January 1943. 6 H11

The airplane is used by Seabrook Farms, N. J., to control crop pests.

WINTERS, S. R. (959)
AIR WAR ON THE GRASSHOPPER. Flying 33 (6): 32–33, 136, illus. December 1943. Libr. Cong.

Airplane distribution of poisoned bait (sawdust, bran, water, and liquid sodium arsenite) for control of grasshoppers and *Anabrus simplex*. From 1934 to 1941 about 600,000 tons of bait were spread over 122,000,000 acres, and $564,000,000 worth of food and feed crops were saved.

ZUMPT, F. (960)
DER FLUGZEUGEINSATZ IN DER MEDIZINISCHEN SCHÄDLINGSBEKÄMPFUNG. Deut. Tropenmed. Ztschr. 47 (13/14): 360–368. July 1, 1943. 449.8 Ar22

Gives historical summary of mosquito control by airplane. German work began in 1941 when malarial sections of Greece, Siberia, and the Ukraine were occupied. Reviews this work and information gained. In 1942 the author worked on the control of *Anopheles* in the Ukraine near the mouth of the Dnepr. Oiling by airplane proved unsatisfactory. A dust mixture (1 part paris green to 20 parts street dust) covered about 37 acres, an average of 100 kg. per 2½ acres (about 4.5 gm. of paris green per 2½ acres). If a lighter diluent (talc) had been used, a larger area could have been covered with a less concentrated mixture. Concludes that the least amount of mixture per 2½ acres should be about 20 kg. With paris green about 18 to 19 parts of diluent should be used, and with calcium arsenite about 15 parts. Suggests the use of the airplane method against culicine larvae (*Aedes*, etc.) and the possibility of controlling *Glossina* spp. in the savannah country of Africa.

References, pp. 367–368.

——— (961)
MALARIA BEKÄMPFUNG IN DER UKRAINE 1942. PT. III. ERFAHRUNGEN UND BEOBACHTUNGEN WÄHREND DER ANOPHELES-BEKÄMPFUNG IN GENERALBEZIRK NIKOLAJEW. Deut. Tropenmed. Ztschr. 47 (11): 265–283, illus. June 1, 1943. 449.8 Ar22

Includes an account of Russian and German experiments in airplane control of *Anopheles* larvae. German work began in August 1942 using one plane equipped for liquid spraying and one for dusting. The spraying method proved useless, but satisfactory results were obtained from dusting with paris green. A lighter dust with finer particle size would be more efficient as a carrier for the poison than the road dust customarily used.

1944

ANONYMOUS. (962)
BETTER DUST WITH MORE NICOTINE TO KILL MORE PESTS. Ariz. Farmer 23 (4): 4. Feb. 12, 1944. 6 Ar44

A new free-flowing nicotine dust for application by airplane has been developed by the laboratory of Arizona Fertilizers, Inc. It contains 8 percent of nicotine, which is released very slowly, preventing dissipation in the air, and is extremely toxic to aphids and all soft-bodied insects.

——— (963)
BOMBER SPRAYS DDT, FOR THE FIRST TIME IN MEDICAL HISTORY AN ENTIRE ISLAND HAS BEEN SPRAYED, SUGGESTING THE IDEA THAT IN THE FUTURE THIS METHOD MAY BE USED TO KILL MOSQUITOES BEFORE TROOPS LAND. Sci. News Letter 46 (20): 310. Nov. 11, 1944. 470 Sci24

A mixture of DDT in oil was sprayed from a specially rigged Marine Corps bomber, which flew at 125 miles per hr. at a height of 150 ft. Ten gal. can be sprayed per min., and it is estimated that an acre can be covered with 2 qt.

——— (964)

BUDWORM [ARCHIPS FUMIFERANA]. Timber of Canada 4 (11): 49–50, map. July 1944. 99.81 T487

Includes discussion of use of autogiro for aerial dusting with DDT over test area in Algonquin Park.

——— (965)

CANADA TO RENEW FIGHT ON SPRUCE BUDWORM [ARCHIPS FUMIFERANA]. Paper Trade Jour. 118 (26): 10. June 29, 1944. 302.8 P196

In May 1944 the Ontario Department of Lands and Forests began spraying infested forests with DDT from an autogiro.

——— (966)

FIGHTING MOSQUITOES IN ITALY. U. S. Army Med. Dept. Bul. 82, pp. 17–18. November 1944. 152.9 Ar52

Refers to the use of airplanes over the marshlands and flooded areas of the Italian Peninsula, Sardinia, and Corsica. Dust is applied from A–20 Havocs flying 20 to 30 ft. from the ground. Other types of planes are used to spray oil on small areas such as canals.

——— (967)

FIRES, BUDWORM [ARCHIPS FUMIFERANA] DEPLETE CANADIAN TIMBER. Paper Trade Jour. 119 (9): 14. Aug. 31, 1944. 302.8 P196

The United States and Canada are carrying on experiments in budworm control with DDT applied by airplane.

——— (968)

GIPSY MOTH [PORTHETRIA DISPAR] WIPED OUT. D. D. T., USED BY THE ARMY IN COMBATTING MOSQUITOES AND TYPHUS-CARRYING LICE, HAS ADDED ANOTHER CONQUEST TO ITS STRING OF TRIUMPHS. Sci. News Letter 46 (5): 68. July 29, 1944. 470 Sci24

Reprinted in part *in* Science 100 (2589, sup.): 10. Aug. 11, 1944. 470 Sci2

——— (969)

MOSQUITOES FOUGHT BY CROP DUSTING METHODS. Sci. News Letter 46 (12): 185. Sept. 16, 1944. 470 Sci24

The U. S. Army Air Forces are combatting malarial mosquitoes in the flooded areas of the Italian Peninsula, Sardinia, and Corsica by dusting from low-flying A–20 Havoc bombers.

——— (970)

NEW METHOD EMPLOYED BY SWEDEN TO FIGHT MENACING FOREST PEST [BUPALUS PINIARIUS]. U. S. Dept. Com. Foreign Com. Weekly 17 (6): 35. Nov. 4, 1944. 157.54 F763

DDT (Gesarol) sprayed from airplane in 80-ft. strips. First tests made in Province of Vastergotland.

——— (971)

PLANE BATTLES ENEMY, AND WE MEAN GRASSHOPPERS—NOT JAPS. Prairie Farmer, Gen. Ed. 116 (22): 10. Oct. 28, 1944. 6 P883B

Broadcasting bait in Greene County, Ill.

——— (972)

SE TRASLADAN AVISPAS POR AVIÓN DE CUBA A MÉJICO PARA COMBATIR LAS PLAGAS INSECTILES. Hacienda 39 (9): 436, illus. September 1944. 6 H11

Airplane transmission of *Eretmocerus serius*.

——— (973)

SPRAYING INSECTICIDES FROM AIRCRAFT MAY PREVENT SPRUCE BUDWORM D-DAY. Du Pont de Nemours, E. I. & Co. Agr. News Letter 12 (6): 95. November/December 1944. 6 D92

Cooperative experiment between the United States and Canada to control *Archips fumiferana* by spraying from a biplane and an autogiro.

*——— (974)

TALLMÄTARKAMPANJEN HAR GIVIT GOTT RESULTAT [THE PINE LOOPER CAMPAIGN HAS GIVEN GOOD RESULTS]. Skogen 31: 291. 1944. [In Swedish.]

In the summer of 1944, three large forest areas in Sweden were successfully dusted with DDT (Gesarol) to control *Bupalus piniarius*.—Abstract *in* Forestry Abs. 7: 103. 1945.

ALLEN, W. H. (975)

WHEN THE FARMER FLIES. THE DEMANDS OF AIR-MINDED AGRICULTURE WILL MEAN JOBS FOR PLANES AND PILOTS. Natl. Aeronaut. 22 (1): 14, 56. January 1944. Libr. Cong.

Mentions the New Jersey work in dusting blueberries, cranberries, peas, and beans. Disabled men, refused commercial flying jobs, are making a living custom-flying dusting airplanes. Development of new aerial methods will further expand the field.

ANNAND, P. N. (976)

ENTOMOLOGISTS HELP INCREASE CROP YIELDS. U. S. Bur. Agr. Econ. Agr. Situation 28 (8): 11–14. August 1944. 1 Ec7Ag

Spraying by aircraft, pp. 13–14.

BAILEY, H. L. (977)

REPORT OF THE DIVISION OF PLANT PEST CONTROL. Vt. Dept. Agr. Bien. Rpt. (1943/44) 22: 42–50. [Processed.] 283.9 V59

On July 7, 1944, airplane spraying was tested against *Anisota rubicunda* feeding on sugar and rock maples. Five acres were treated with DDT, and dead or dying larvae were collected after 6 hr. Untreated check trees were almost completely defoliated at the end of September, whereas little damage was noticed on the sprayed trees. Twenty acres were sprayed with cryolite. Although of slower action than DDT, it had greatly reduced larval feeding by July 18.

BARNUM, C. C. (978)

CONTROL OF APHIS. AIRPLANE DUSTING USED. Diamond Walnut News 26 (4): 8. July 1944. 94.68 D34

Nicotine sulfate dust, used 25 to 35 lb. per acre, will effectively control *Chromaphis juglandicola*. Dusting should be done when there is no wind.

BROWER, G. K. (979)

FUMIGATING THE AIRLINERS. Air Transport 2 (8): 117–118. August 1944. Libr. Cong.

Includes insect control by hydrocyanic acid gas and aerosol bombs.

BROWN, A. C. (980)

QUARANTINE INSPECTION DEPARTMENT. [REPORT.] Fla. State Plant Bd. Bien. Rpt. (1942/44) 15: 32–35. 464.9 F662R

Points out the great increase in aircraft arrivals from foreign countries and the probability of further increase after the war. States that during the past fiscal year 404 determinations have been made of insects intercepted. Of these, 18 were fruit flies and 22 were insects either new or rare in this country. Cites qualifications of a good aircraft inspector.

BROWN, R. C., and SHEALS, R. A. (981)

THE PRESENT OUTLOOK ON THE GYPSY MOTH [PORTHETRIA DISPAR] PROBLEM. Jour. Forestry 42 (6): 393–407, illus. June 1944. 99.8 F768

Refers to the use of an autogiro to distribute concentrated sprays and oil-coated insecticides. In 1942 excellent results were obtained over rough country in Connecticut, New York, and Pennsylvania with a slow-speed biplane capable of carrying a load of 1,000 lb. Cryolite appears to be very well suited to aircraft distribution as a concentrated spray since it adheres to foliage very well in this form.

References.

CALIFORNIA BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE. (982)

[REPORT OF] H. M. ARMITAGE, CHIEF. Calif. Dept. Agr. Bul. 33 (4): 228–275. October/December 1944. 2 C12M

Airplane use in pest control, pp. 239–240; insecticidal poisoning of bees, p. 254; airplane inspection, p. 273.

Consult previous reports for earlier records, beginning with the Report of W. C. Jacobsen in the December 1928 issue of the Monthly Bulletin.

DAUBERSCHMIDT. (983)
ZUR FLUGZEUGBEKÄMPFUNG DES MAIKÄFERS. Forstwiss. Centbl. u. Tharandter Forstl. Jahrb. 1944, No. 1, pp. 64–68. March 1944. 99.8 F775

After preliminary experiments, the first practical work was carried out on the Johannisburg heath against *Melolontha* spp. in the spring of 1941 by the Flieger Forstschutzverband in cooperation with the Forstschutzstelle Ost. Following tests made in 1942, the Flieger Forstschutzverband and the Pflanzenschutzamt München dusted 450 ha. in the Altmühltal area during 1943. Describes the nature of the terrain and cites difficulties experienced by the pilots because of the narrow valley. Dinitro-o-cresol (K–3 from Borchers, Goslar) was used and proved most satisfactory when applied at the rate of 100 kg. per ha. Ground dusters were used on the edges of the forests and on steep slopes. Since all beetles did not emerge at the same time, repeated dustings were necessary. The average mortality was 70 percent. Tests were also made with F 114 (a stomach poison) and DDT (Gesarol, a contact poison) from Schering, Berlin. Both proved effective and caused no damage to vegetation or to warm-blooded animals. The best results were obtained during cool weather.

DAVIAULT, L. (984)
LA LUTTE CONTRE LA TORDEUSE [ARCHIPS FUMIFERANA]. Forêt Québecoise 8 (4): 277. November 1944. 99.8 F79

Refers to airplane dusting with DDT.

DOEHLERT, C. A. (985)
WORK OF THE CRANBERRY RESEARCH LABORATORY. Amer. Cranberry Growers' Assoc. Proc. (1944) 75: 17–21. 81 Am35C

In airplane tests of cryolite bait vs. lead arsenate bait for grasshopper control, very little difference was noted in results. Cryolite has the advantage of being safe to use in much larger quantities per acre.

ECKERT, J. E. (986)
MORE EFFICIENT CONTROL OF THE USE OF INSECTICIDES IS URGENTLY NEEDED. Iowa State Apiarist. Rpt. (1943) 25: 62–67. 1944. 424.9 Io9

Reviews the problem of poisoning from the application of insecticides by ground machines or aircraft, with particular reference to the effect on apiculture. Lists the principles which should be embodied in necessary county and State regulations; urges organization of the beekeeping industry to meet the danger.

GEETE, E. (987)
FLYGMASKINEN I SKOGSVÅRDENS TJÄNST [THE AIRPLANE IN THE SERVICE OF FORESTRY]. Skogsbrukeren 19 (20): 149–153. Oct. 15, 1944. [In Swedish.] 99.8 Sk54

On August 23, 1944, a Junker plane (type W–34) was used to treat pine forests in Västergötland with DDT (Gesarol) against *Bupalus piniarius*. The plane flew at a speed of 140 km. per hr., and the width of the dust cloud varied from 25 to 50 m. Dust fell at the rate of 13.5 m. per sec. A load of 500 kg. lasted for 500 sec. and was sufficient to cover 500 acres.

GINSBURG, J. M. (988)
MOSQUITO OILS, LARVICIDES, REPELLENTS, OUTDOOR SPRAYS AND THEIR APPLICATION. N. J. Agr. Expt. Sta. Bul. 711, 12 pp. New Brunswick, 1944. 100 N46S

Refers briefly to use of airplanes for dusting paris green over breeding places, and to limited use for spraying with oil or liquid larvicides.

GREAT BRITAIN MINISTRY OF HEALTH. (989)
DISINFESTATION OF AIRCRAFT AND AERODROMES. REPORT OF THE BRITISH WEST INDIAN QUARANTINE CONFERENCE, TRINIDAD, NOV., 1943. Emergency Pub. Health Lab. Serv. [London]. Monthly Bul. 3: 108–110. July 1944. Army Med. Libr.

Methods of spraying, administrative action, especially dangerous areas, vectors of plant disease.

GUBESHE [pseud.]. (990)
THESE ITALIANS ARE FAMOUS—BUT THEY ARE BEES. Farmer [Pietermaritzburg] 33 (4): 10. Jan. 28, 1944. 24 F227

By arrangement with the U. S. Department of Agriculture queens of *Apis mellifera* were shipped by airplane to the Union of South Africa.

HAYES, F. L. (991)
[NEW MACHINES OR EQUIPMENT APPLICABLE TO MOSQUITO CONTROL.] Calif. Mosquito Control Assoc. Proc. and Papers (1944) 13: 91–93. [Processed.] 428 C763

Predicts extensive use of the helicopter for spraying mosquito breeding waters. States that it is more satisfactory than either the airplane or the autogiro. Its advantages are its ability to go straight up or down, to hover, and to fly either forward or backward. When equipped with pontoons, it can land on water or soft ground.

HERMS, W. B., and GRAY, H. F. (992)
MOSQUITO CONTROL. PRACTICAL METHODS FOR ABATEMENT OF DISEASE VECTORS AND PESTS. Ed. 2, rev., 419 pp., illus. N. Y., Commonwealth Fund, 1944. 428 H422M

Airplane Application of Oils and Dusts, pp. 235, 259–265, 339. Transportation of Mosquitoes by Aircraft, pp. 9, 292–296.

HODELL, C. M. (993)
AERIAL PHOTOGRAPHY FOR MOSQUITO AND ALL SANITATION PROBLEMS. N. J. Mosquito Extermin. Assoc. Proc. (1944) 31: 29–31, illus. 420 N46

Cites the value of topographic maps made from aerial photographs in planning control operations.

HOLLIS, M. D. (994)
ENGINEERING ASPECTS OF MOSQUITO CONTROL. II. MALARIA CONTROL IN WAR AREAS. Civ. Engin. 14 (11): 467–[470], illus. November 1944. 290.8 C49

Includes statement on eight airplane dusting projects which were carried out in six States. About 400,000 lb. of a 25-percent paris green mixture were applied over 66,000 acres at an average cost of $1.12 per application per acre. Reduction in *Anopheles quadrimaculatus* varied from 90 to 99 percent.

HUFF, C. G. (995)
INSECTS, DISEASE, AND MODERN TRANSPORTATION. *In* Taliaferro, W. H., ed., Medicine and the War, pp. 76-88. Chicago, Univ. Chicago Press, 1944. (Charles R. Walgreen Foundation Lectures.) 448 T14

Discusses insect distribution by aircraft, with especial reference to *Anopheles gambiae*.

Hunt, J. C. (996)
THE MORMON CRICKET WAR. Amer. Forests 50 (9): 438–439, 454, illus. September 1944. 99.8 F762

Includes account of airplane distribution of poison bait (bran, sawdust, and sodium fluosilicate) against *Anabrus simplex* in northeastern California.

INGRAM, J. W., BYNUM, E. K., HALEY, W. E., and CHARPENTIER, L. J. (997)
RESEARCH ON INSECTICIDAL CONTROL OF THE SUGARCANE BORER [DIATRAEA SACCHARALIS] IN 1943 BY THE HOUMA, LOUISIANA, LABORATORY. Sugar Bul. 22 (15): 115–117. May 1, 1944. 65.9 Am32

Under 1943 conditions, airplane dusting was as effective against first-generation borers as ground-machine dusting. Various insecticides were tested, but none gave as good results as cryolite (both synthetic and natural). DDT, at 16 percent strength in pyrophyllite dust, gave only 74 percent control as opposed to 97 percent for cryolite. Large acreage experiments in airplane dusting against second-generation borers resulted in 50 percent less injury at harvesttime than on untreated fields. Author concludes that cryolite dusting should be a common agricultural practice, but it cannot be expected to pay unless the borer infestation is heavy.

KHATUNTSEV, I. I., BLAKHOV, A. A., and KUPTSOVA, A. D. (998)
K VOPROSU O PRIMENENII PARIZHSKOĬ ZELENI I NEFTI NA RISOVYKH POLIAKH ASTRAKHANSKOGO RAĬONA [IN REGARD TO THE USE OF PARIS GREEN AND PETROLEUM ON THE RICE FIELDS OF THE ASTRAKHAN REGION]. Med. Parazitol. i Parazitar. Bolezni 13 (2): 61–63. 1944. [In Russian.] 448.8 M469

In order to set up an effective system of control for malarial mosquitoes the Astrakhan Agricultural Experiment Station and the Astrakhan Branch of the Institute of Malaria and Tropical Diseases conducted observations in 1939 on the effect of larvicides on rice varieties at different stages of growth. Airplane dusting with paris green was carried out at time of stalk formation and flowering (0.33 kg. of paris green plus 0.67 kg. of tripoli earth per ha.). No damage to plants resulted. Yields were normal except for the Kendzo variety which gave 1 cwt. less per ha. in the dusted plots than in those untreated. This difference, however, may have been caused by other factors.

*KNIES, P. T. (999)
QUARANTINE AND DISINSECTIZATION OF AIRCRAFT. Air Surgeon's Bul. 1 (10): 16–18. October 1944. Army Med. Libr. (Restricted war material)

KRUSE, C. W., HESS, A. D., and METCALF, R. L. (1000)
AIRPLANE DUSTING FOR CONTROL OF ANOPHELES QUADRIMACULATUS ON IMPOUNDED WATERS. Natl. Malaria Soc. Jour. 3 (3): 197–209, illus. September 1944. 448.9 N213

Erratum to p. 208 (specifications for paris green) appears *in* Natl. Malaria Soc. Jour. 4 (1): 8. March 1945. 448.9 N213

Deals with airplane dusting on reservoirs of the Tennessee Valley Authority since 1938. Major advances are in: (1) mechanical improvements in the duster, (2) methods of dust valve calibration, dust mixing, and tagging, (3) application and evaluation of general field treatment practices, and (4) specifications for paris green with particular reference to particle size. Gives detailed description and diagrams of dusting plane, dust hopper, agitators, release valve, Venturi tubes, etc. Dusting was carried out in the early morning by planes flying at a height of 20 to 30 ft. Observations showed that the dust distribution curve skewed markedly to the left, that 20 percent of paris green released falls in central 100 ft. of swath, 8 percent on second 100 ft., remainder drifts away from treatment area and is lost. Chart shows effective swath widths for 70 percent and 90 percent larval kills under varying conditions. Studies indicated that for airplane dusting it is desirable to get paris green of a larger particle size than most commercial types. Outlines a tentative revision for paris green specification.

References.

MCCORMICK, A. O'H. (1001)
NAZI MALARIA MOSQUITO CAMPAIGN HALTED BY AIRPLANE DUSTING OF DDT. Engin. News-Rec. 133 (14): 427–428. Oct. 5, 1944. 290.8 En34

Reprinted from the New York Times, Sept. 13, 1944.

Refers to the deliberate flooding of the Agro Romano, near Rome, to create a breeding place for *Anopheles* mosquitoes. The malaria control branch of the Allied Control Commission combated the menace successfully by airplane dusting with DDT.

Partial translation *in* Rev. Nac. de Cien. Polít.-Econ.-Sociales 3 (36): 26. November 1944. 280.8 R3295

MCDONALD, J. E. (1002)
URGES MEASURE TO STEM TIDE OF PINK BOLLWORM [PECTINOPHORA GOSSYPIELLA]. Cotton Digest 17 (1): 6, 14. Sept. 30, 1944. 286.82 C822

Discusses use of DDT for joint airplane dusting project between the United States and Mexico.

MENUSAN, H., JR. (1003)
AIRPLANE DUSTING FOR INSECT CONTROL. Natl. Shade Tree Cong. Proc. (1944) 20: 161–165. 99.9 N218

Gives brief history of airplane dusting, citing advantages and disadvantages of the method. The greatest promise for future work lies in the application of concentrated sprays by either airplane or autogiro. Discusses cooperative

experiments with DDT against *Porthetria dispar* carried out near Scranton, Pa., during 1944 by the U. S. Department of Agriculture and the Pennsylvania Department of Agriculture.

Discussion, pp. 165–169.

METCALF, R. L., and HESS, A. D. (1004)

THE RELATION OF PARTICLE SIZE TO THE EFFECTIVENESS OF PARIS GREEN USED IN AIRPLANE DUSTING FOR MOSQUITO CONTROL. U. S. Pub. Health Rpts. 59 (45): 1458–1465. Nov. 10, 1944. 151.65 P96

Because the fine particle size of standard paris green causes 75 percent to drift away, studies were made with coarser dusts. In laboratory tests, 1st- to 4th-instar larvae of *Anopheles quadrimaculatus* were able to ingest particles with maximum diameters of 29, 51, 68, and 106 μ, respectively. A particle of about 40 μ in diameter (0.05 mg. per gm. of body weight) was a lethal dosage for a 4th-instar larva. Special paris green, with particles 20 to 50 μ in diameter constituting 84 percent by weight, was compared (in airplane tests) with standard paris green (48 percent by weight in the same size range). In field tests with the coarser dust, the amount reaching the treated areas increased 60 percent. The larval kill was 90 to 100 percent. It is no more expensive to manufacture than the standard dust. A change in specifications for paris green is recommended.

MILLER, J. N. (1005)

BUGS IN THE BLUE. Sat. Evening Post 216 (39): 39. Mar. 25, 1944. 110 S

Airplane trap collection.

MOLDENKE, H. N. (1006)

STRATEGIC PLANTS. SCIENTIFIC RESEARCH PROMPTED BY WORLD CONDITIONS LEADS TO NEW ADAPTATIONS AND NEW LOCALITIES FOR PLANTS PROVIDING VITAL INSECTICIDES, DYES, AND TANNING AGENTS. Nat. Hist. 53 (4): [154]–159, illus. April 1944. 500 N483J

Refers to spread of insects by aircraft, and illustrates spraying of plane with aerosol bomb.

MURRAY, W. C., and KNUTSON, H. (1007)

AIRPLANE DUSTING WITH PARIS GREEN FOR CONTROL OF ANOPHELES QUADRIMACULATUS SAY IN WATER-CHESTNUT COVERED AREAS OF THE POTOMAC RIVER DURING 1943. U. S. Pub. Health Serv. Rpts. 59 (18): 573–583, illus. May 5, 1944. 151.65 P96

Weekly dustings, using 2 Stearman biplanes, were carried out during the breeding season. Special dusting equipment is described. Paris green (40,277 lb.) was applied over 32,536 acres at an average cost of $1.20 per application. The over-all control was 96.93 percent. Factors involved in the success of operations were: careful preplanning, close supervision during operations, coordination of engineering and entomological services, correlation of dust applications with entomological findings, and the skillful work of the pilots.

NATIONAL COTTON COUNCIL OF AMERICA. PRODUCTION, PROCESSING AND MARKETING DIVISION. (1008)

INSECT AND DISEASE CONTROL. Natl. Cotton Council Amer. Ann. Rpt. of Activ. 5: 45–47. Jan. 1, 1944. 281.3729 N212

Airplane Dusting, p. 17. States that the Council acted as a clearing house for unorganized airplane crop dusters.

OSSOWSKI, L. L. (1009)

THE CHEMICAL DESTRUCTION OF FOREST PESTS. Endeavour 3 (9): 32–37, illus. January 1944. 472 En2

A review of previous work, including airplane dusting, with stomach and contact insecticides.

References, p. 37.

PECK, S. (1010)

AIRBORNE PLAGUES? Flying 35 (6): 28–29, 140, 142, illus. December 1944. 333.8 F673

Tropical diseases and their vectors may be imported by aircraft. Refers to disinfestation of planes and airports.

PEMBERTON, C. E. (1011)
ENTOMOLOGY. A REPORT. Hawaiian Sugar Planters' Assoc. Com. Charge Expt. Sta. Rpt. 1942/43: 14–18. *In* Hawaiian Sugar Planters' Assoc. Ann. Mtg. (1943) Rpt. 63. Honolulu, 1944. 65.9 H314

Quarantine—Project E–9, pp. 17–18. The Entomology Department of the Experiment Station handled the identification of all insects taken on planes by the Army, Navy, and U. S. Public Health Service. Many mosquitoes were collected. *Prodenia litura* was the most dangerous crop pest found during the year. Aerosol bombs are now used to disinfest planes.

——— (1012)
INSECTS CARRIED IN TRANSPACIFIC AIRPLANES, A REVIEW OF QUARANTINE WORK PRIOR TO DECEMBER 7, 1941. Hawaiian Planters' Rec. 48 (3): 183–186. 1944. 25 H311

Gives a historical summary of the inspection and disinfestation of trans-Pacific service planes arriving at Honolulu. Includes brief records on insects of especial interest, which were collected.

R., E. F. (1013)
DDT KILLS GYPSY MOTH. Amer. Nurseryman 80 (7): 22–23. Oct. 1, 1944. 90 Am371

Describes the successful airplane-spraying experiment with DDT over 20-acre woodlot near Scranton, Pa., May 3, 1944. Eggs started to hatch on May 4, and between May 3 and 16 there was no evidence of feeding by larvae. It was later discovered that DDT will kill *Porthetria dispar* in the pupal state. There was no sign of injury to birds or livestock.

RONEY, J. N. (1014)
HINTS FOR CONTROL OF COTTON INSECTS. Ariz. Agr. Col. Ext. Folder W–30, [5] pp. March 1944. 275.29 Ar42Ext

Airplane dusting hints, p. 5.

RUBIN, N. N. (1015)
CALCULATION OF THE TURNING RADIUS OF AN AIRCRAFT. Aero Digest 45 (6): 116–117, illus. June 15, 1944. 333.8 Ae82

SASSCER, E. R. (1016)
INFLUENCE OF THE WAR ON PLANT QUARANTINE. Jour. Econ. Ent. 37 (3): 356–359. June 1944. 421 J822

Includes discussion of the danger of insect dissemination as a corollary to the expansion of air transportation and rapid establishment of landing fields for foreign planes.

SCAMAN, J. (1017)
USE OF THE AIRPLANE IN THE ORCHARD. Wash. State Hort. Assoc. Proc. (1944) 40: 53–54. 81 W273

Recommends use of hormone sprays, and advises experiments in the application of dormant sprays. This method is not satisfactory against *Carpocapsa pomonella*. Stresses need for intelligent and competent pilots.

STAGE, H. H. (1018)
SABOTEUR MOSQUITOES. Natl. Geog. Mag. 85 (2): 165–179, illus. February 1944. 470 N213

Mentions aerial mapping in the campaign against *Anopheles gambiae* in Brazil. Illustrations show a Tennessee Valley Authority plane applying paris green near Decatur, Ala., and also the use of a pyrethrum spray to disinfest an airliner.

STAROSTIN, S. (1019)
AVIAKHIMMETOD BOR'BY S VREDNOĬ CHEREPASHKOI [CONTROL OF EURYGASTER INTEGRICEPS BY AIRCRAFT]. Vsesoĭuzn. Akad. Sel'sk. Khoz. Nauk im. V. I. Lenina. Dok. 9 (4): 25–27. 1944. [In Russian.] 20 Ak1

The biological method of control, proposed by T. D. Lysenko, is the most effective under conditions in Uzbekistan. A shortage of the necessary fowls prevented its practice, and in 1941 the Plant Protection Station of the All-Union Scientific Research Cotton Institute conducted a study of chemical control measures. Further tests in 1942 gave the following results when 5 kg. of calcium arsenite was used per ha.: Samarkand region—43.1 percent;

Tashkent—65.2 to 91.8 percent; Kashka Dar'îâ—65 to 100 percent. A detailed account is given of two tests in the Kashka Dar'îâ region. Success depends on the presence of dew or other moisture in the air, and dusting must be completed 15 days before harvesting time. There was no injury to the wheat. A mortality of 95 to 100 percent can be obtained among the nymphal forms. Tests were also made with a solution of sodium arsenite (2 percent) and of sodium nitrate (15 percent). Both were applied at the rate of 100 l. per ha. Conditions were not favorable, and there was considerable injury to the wheat. In 1943 satisfactory work was done in Uzbekistan and in the Kirgizskaîâ SSR with a calcium arsenite dust applied at the rate of 4 or 5 kg. per ha.

——— (1020)

AVIAOPRYSKIVANIE V BOR'BE S VREDITELÎÂMI KHLOPCHATNIKA [AIRPLANE SPRAYING IN COTTON PEST CONTROL]. Vsesoîûzn. Akad. Sel'skokhoz. Nauk im. V. I. Lenina. Dok. 9 (5/6): 36–40. 1944. [In Russian.] 20 Ak1

An account of experiments by NIIGVF (Nauchno-Issledovatel'skii Institut Grazhdanskogo Vozdushnogo Flota) on the application of sprays against cotton pests. Work was done in August and September 1941 in the Krasnodar region; in 1942, in Azerbaidzhan. Against "khlopkovaîâ sovka" (*Heliothis armigera*) a 5-percent suspension of calcium arsenate was almost as effective as a dust, and a 10-percent suspension more effective. Both were applied at the rate of 60 l. per ha. The amount of insecticide saved was 70 and 40 percent respectively. Judged on the basis of 1 hr. of flight, a greater area can be covered with a dust; on a daily or seasonal basis the sprays, which are independent of weather conditions, make a better showing. A water solution of anabasine sulfate (2.5 kg. anabasine sulfate, 2.5 kg. soap, 100 l. water) gave 100-percent mortality of aphids in 48 hr. Either this dosage or one reduced by one-half proved more effective when used as a dust. A 4-percent solution of anhydrous sodium carbonate (soda ash) and soap caused 68.7-percent mortality of *Epitetranychus althaeae* on the 6th day; a 10-percent suspension of sulfur and soap gave 77.2 percent. Since the infestation was light, further experiments are needed. None of the insecticides used caused burning or other injury of the cotton plants.

UNITED STATES CONGRESS. SENATE. COMMITTEE ON APPROPRIATIONS (1021)

FIRST SUPPLEMENTAL APPROPRIATION BILL FOR 1945. HEARINGS . . . 78TH CONG., 2D SESS. ON H. R. 5587. 294 pp. Washington, D. C., U. S. Govt. Print. Off., 1944. 148.7 Ap6

Statements by Wallace H. White, Jr., Ralph O. Brewster, P. N. Annand, and E. I. Kotok on projected airplane spraying experiments against *Archips fumiferana*, using DDT as the insecticide, pp. 119–132.

UNITED STATES NAVAL MEDICAL SCHOOL, BETHESDA, MD. (1022)

ARTHROPODS OF MEDICAL IMPORTANCE WITH SPECIAL REFERENCE TO MALARIA CONTROL. 211 pp. Bethesda, Md., 1944. [Processed.] 153.56 Ar7

Discussion of airplane distribution, with diagrams of dusting equipment, p. 124.

UNITED STATES PUBLIC HEALTH SERVICE. (1023)

ANNUAL REPORT, 73D, 1943/44. 120 pp. Washington, D. C., 1944. 151.65 An7

Submitted by Thomas Parran.

Airplane inspection, pp. 60–61; DDT for disinfestation of aircraft, p. 62; airplane dusting with paris green, p. 77.

UNITED STATES TENNESSEE VALLEY AUTHORITY. (1024)

AIRPLANES IN MALARIA CONTROL. U. S. Tenn. Val. Authority. Ann. Rpt. (1943/44) 11: 40–41. 1944. 173.2 T25A

Submitted by G. R. Clapp.

Refers to dusting and spraying of mosquito breeding places. DDT was tested in the form of dust, spray, and aerosols.

UNITED STATES WAR DEPARTMENT. (1025)

USE OF DDT AS AN INSECTICIDE TO KILL ADULT MOSQUITOES. U. S. War Dept. Tech. Bul. TB Med 110, 5 pp. Washington, 1944. 152.1 Us2

Includes discussion of airplane application of oil solutions. Describes technique applicable to Cub-type planes and to faster, heavier planes.

WELLENSTEIN, G. (1026)
SICHTBALLONE ZUR ERLEICHTERUNG DER FLUGZEUGBEGIFTUNG. Forstarchiv 20(1/2): 33–35. Jan. 15, 1944. 99.8 F7723

Discusses the use of balloons for signaling since the unsuccessful tests of H. Leineweber in 1934. In 1936 the author experimented with small balloons of india rubber. Although inexpensive and requiring only a small amount of hydrogen, they could not be used because they burst easily from the effects of rain and air or wind pressure. The thin cords also became tangled in the treetops, or broke. In later cooperative experiments with the firm of August Stelling, a new type was developed, made of a rubberized cotton material, with a buoyancy of from 3 to 6 kg. A 40 m. hemp cord was attached and the weight was from 2.3 to 3.5 kg. The oval shape permitted it to rise rapidly, while a special valve prevented bursting from the sudden decrease in air pressure. This type of balloon was successfully used in work against *Lymantria monacha* in the Thüringen forest.

YOLLES, T. K., YOLLES, S. F., and BYRD, D. A. (1027)
ON THE OCCURRENCE OF ANOPHELES PESSÔAI IN TRINIDAD, B. W. I. Science 100(2607): 547–548. Dec. 15, 1944. 470 Sci2

This South American species has never before been reported from the West Indies. Evidence indicates that it was introduced to Trinidad by airplane.

ZUMPT, F. (1028)
FLUGZEUGEINSATZ ZUR STECHMÜCKENBEKÄMPFUNG. Deut. Tierärztl. Wchnschr./Tierärztl. Rundschau 52/50(31/32): 299–300, illus. July 29, 1944. 41.8 D482

Summarizes work done in various countries. Before 1941, German use of the airplane was confined to forest insect control, but the movement of troops into malarial sections of occupied territories necessitated its adoption for mosquito control. Calcium arsenite, used in the Dnepr Valley in 1942, gave 100 percent mortality of *Anopheles* larvae but proved very injurious to warm-blooded animals. In 1943 large-scale work was carried out with a thiodiphenlyamine dust which was effective and was practically harmless to animals. For 100 percent mortality of *Anopheles* larvae 2 kg. of thiodiphenylamine per ha. of swamp surface was necessary. With a load of 1500 kg. at least 100 ha. could be dusted, thus depositing about 15 kg. on each ha. Since only 2 kg. of poison is needed, 13 kg. of filler could be substituted. The formula decided on was 3 parts of filler to 1 part of insecticide, giving 3–4 kg. of poison per ha. Talc could not be obtained and the contact poisons Effusan and Lipan were, therefore, substituted as fillers. The combination of stomach and contact poisons proved highly effective against both larvae and adults of species of *Anopheles*, *Culex*, *Aedes*, and *Mansonia*.

1945

ANONYMOUS. (1029)
AERIAL ATTACK ON INSECTS. Food in Canada 5(12): 26–28, illus. December 1945. 389.8 F7323

Experimental dusting of pea fields against *Macrosiphum pisi* was carried out by Stokely-Van Camp of Canada, Ltd., in cooperation with Leavens Bros. Air Service, Ltd., of Toronto. A rotenone and Pyrax mixture gave 90 percent mortality. Expense of airplane application is high, about $10 per acre. A device, attached to the outside of the plane for the purpose of providing power to agitate the dust in the hopper, is illustrated.

——— (1030)
AERIAL WAR ON LOOPER [LAMBDINA FISCELLARIA]. Timberman 46(10): 92, 94, illus. Aug. 1945. 99.81 T484

Discusses the spraying of 12,000 acres of forest in Clatsop Co., Oreg. In comparative tests, a mixture of lead arsenate and fish oil was applied at a cost of $5.00 per acre while DDT and fuel oil cost $3.00 per acre.

——— (1031)
DUST CROPS AND REAP PROFITS. Aviation 44(8): 166–167, 246, 248–249, 251, illus. August 1945. Libr. Cong.

Discusses crop dusting as a business. Includes detailed list of construction materials required for dusting units. Shows diagrams of the conveyor box and of the dust hopper designed by the U. S. Department of Agriculture.

——— (1032)
FIGHTING MALARIA. Hygeia [Chicago] 23(1): 14. January 1945. 449.8 H993

The U. S. Army Air Forces use airplane dusting and spraying against malarial mosquitoes in the Mediterranean war theater.

——— (1033)
INVESTIGATIONS TO CONTROL TSETSE FLY [GLOSSINA SPP.] BY SPRAYING FROM THE AIR. RESULTS OF PRELIMINARY TRIALS AT MKUZI. Farmer [Pietermaritzburg] 34 (47): 10. Nov. 23, 1945. 24 F227

Quotes official statement from the Department of Agriculture, Union of South Africa, on work in northern Zululand. Valuable information gained in regard to technique and equipment will be applied to future large-scale experiments.

——— (1034)
PRELIMINARY ATTACK ON SPRUCE BUDWORM [ARCHIPS FUMIFERANA] RECENTLY COMPLETED. PROBLEM BEING APPROACHED FROM VARIOUS ANGLES, INCLUDING SPRAYING OF 64,000 ACRES WITH DDT. Canada Lumberman 65 (15): 10–11, illus. Aug. 1, 1945. 99.81 C16

Brief report on first large-scale spraying project carried out in the Nipigon Lake area. Illustrations show planes (specially adapted Canso flying boats) and spray spar used to release DDT into plane's slipstream. Results, although not final, appear encouraging.

——— (1035)
SPRAYING PEAS BY PLANE. Family Herald and Weekly Star 76 (34): 6. Aug. 22, 1945. 7 F21

Brief account of first Canadian attempt to control *Macrosiphum pisi* by airplane dusting.

——— (1036)
VICTORY OVER ONION THRIPS [THRIPS TABACI]. HARD-TO-CONTROL PEST CONQUERED BY LETHANE B–71. Rohm & Haas Rptr. 3 (1): 3, illus. March 1945. 381 R63

Airplane experiments were made over 300 acres of onion fields in the Gun Swamp region near Kalamazoo. The dusts used were based on Lethane B–71. A mortality of from 95 to 98 percent was obtained with the dusts, and the dusting program was extended to cover 4,000 acres. Two applications, a week apart, gave the best results. Surrounding grain acreage and ditches were also treated.

BATCHELDER, C. H., and QUESTEL, D. D. (1037)
EXPERIMENTS WITH DDT FOR THE CONTROL OF THE EUROPEAN CORN BORER [PYRAUSTA NUBILALIS] INFESTING SWEET CORN AT TOLEDO, OHIO, IN 1944. U. S. Bur. Ent. and Plant Quar. E–659, 11 pp. [Washington, D. C.] 1945. [Processed.] 1.9 En83

A concentrated spray (8.9 percent of DDT in white oil), applied by airplane to the variety Evergreen at the rate of about 2.25 gals. per acre, reduced borer populations 98 percent. The rows in the center of the treated strip produced ears which were all of salable size and borer free. Four applications were made, from 3 to 5 days apart. DDT dust treatments reduced borers 82.3 percent, and 85.6 percent of the yield was grade No. 1 and borer free.

BECHTOLD, P. G. (1038)
OXYGEN EQUIPMENT IN THE DISPERSAL OF INSECTICIDES, A PRELIMINARY REPORT. Air Surgeon's Bul. 2 (3): 68–70, illus. March 1945. Army Med. Libr. (Restricted war material.)

*BERNSTRÖM, N. (1039)
FLYGET RÄDDER SKOGEN [THE AIRPLANE SAVES THE FOREST]. Svenska Skogsvärdsför. Tidskr. 43: 79–83. 1945. [In Swedish.]

Dusting was carried out at Hökensås, Sweden, against *Bupalus piniarius*. Gesarol was used at the rate of 8 kg. per ha. Balloons were used as markers and the airplane, which flew at heights from 5 to 10 m. above the tree tops, was directed by radio. Discusses the effect of weather conditions and the type of apparatus used on the behavior of the dust. Includes description of a new type of dusting apparatus designed for this work.—Abstract *in* Forestry Abs. 7: 358. 1946.

CRAIGHEAD, F. C., and BROWN, R. C., comp. (1040)
SUMMARY OF TESTS WITH DDT IN 1944 FOR CONTROL OF FOREST INSECTS. U. S. Bur. Ent. and Plant Quar. E–649, 7 pp. [Washington, D. C.] 1945. [Processed.] 1.9 En83

Includes a summary of aerial experiments with DDT against *Porthetria dispar* in Connecticut and Massachusetts; *Anisota rubicunda* in Vermont; *Neodiprion lecontei* in New York, and *Archips fumiferana* in Canada and Colorado. Also discusses results of tests to determine DDT residue remaining after a rain in a 3-acre reservoir at Pittston, Pa., following treatment of a surrounding wooded watershed.

DEONIER, C. C., and BURRELL, R. W. (1041)
AIRPLANE APPLICATION OF DDT LARVICIDES. Jour. Econ. Ent. 38(4): 425–427. August 1945. 421 J822

Although DDT in its present dust forms has been successfully used, it is not recommended for airplane application because of certain undesirable physical characteristics. The high toxicity of DDT makes it possible to use sprays in amounts small enough to be economically feasible. A high degree of control over droplet size is possible, extremely low flying is not required, and adequate coverage is easily obtained. The spray unit developed by C. N. Husman and O. M. Longcoy for the Piper Cub plane can be adapted to other types of planes. It proved very satisfactory when a 5 percent DDT spray was used in a dosage as low as 1 qt. per acre. Both a kerosene solution and a Xylene emulsion proved effective against either anopheline or culicine larvae.

DETHIER, V. G. (1042)
THE TRANSPORT OF INSECTS IN AIRCRAFT. Jour. Econ. Ent. 38(5): 528–531. Oct. 1945. 421 J822

Aerial fauna does not gain entry to aircraft during flight but is for the most part directed away from the plane by action of airflow and slipstream. In grounded aircraft the majority of insects are found in the cabin because of greater ease of access and more favorable conditions for survival. Wing and tail spaces and the nacelles are of minor importance for control programs. Tables of collections made in Africa seem to warrant the conclusion that it is possible to find almost any type of insect in aircraft. Most important factors are the abundance and behavior of the species in the immediate vicinity of airstrips. Recommends proper sanitation at airports and the parking of planes away from edges of jungles, fields, or watercourses. Aerosol bombs, properly used, are adequate for disinfestation of cabins.

DOWDEN, P. B., WHITTAM, DONALD, TOWNES, H. K., and HOTCHKISS, NEIL. (1043)
DDT APPLIED AGAINST CERTAIN FOREST INSECTS IN 1944, PARTICULARLY WITH AERIAL EQUIPMENT. U. S. Bur. Ent. and Plant Quar. E–663, 13 pp., illus. [Washington, D. C.] 1945. [Processed.] 1.9 En83

Gives results from aerial spraying tests against *Porthetria dispar*, *Anisota rubicunda*, *Neodiprion lecontei*, and *Archips fumiferana*. Various formulas are given for the DDT oil sprays which were distributed in the form of finely atomized mists. Good residual toxicity was obtained with all formulas. All test plots, except one where a Piper Cub was used, were sprayed from a White Standard biplane equipped with a spinner-disk distributing apparatus. Illustrations show the biplane and the apparatus. Analysis of water samples taken from a reservoir 3 days after spraying the watershed, and after a rainfall of 0.75 in., showed less than 1 part of DDT in 100 million parts of water. Bird life was not adversely affected although there was some mortality among fish and bullfrogs. Three days after spray application enough insect specimens remained to repopulate the area.

EAKIN, W. E. (1044)
DDT TRIALS WITH COTTON. Farm and Ranch 64 (7): 10. July 1945. 6 T31

Report on a cooperative dusting experiment by the Goodyear Tire & Rubber Co. and the U. S. Bureau of Entomology and Plant Quarantine. DDT applied by airplane for the control of hemipterous insects, greatly increased yield of cotton per acre.

FISHER, E. H. (1045)
AIRPLANE DUSTING OF CANNING PEAS. 7 pp. Madison, 1945. (Wis. Agr. Col. Ext. Spec. Cir.) [Processed.] 275.29 W75S

A general discussion including suitable insecticides and planes, planning of operations, and technique of dusting.

GRAHAM, K. (1046)
THE CURRENT OUTBREAK OF DEFOLIATING INSECTS IN COAST HEMLOCK FORESTS OF BRITISH COLUMBIA. PT. III. CONSIDERATIONS OF CHEMICAL CONTROL. Brit. Columbia Lumberman 29 (4): 38–39, 60, 62, 64, 118, 120, 122, 124, 126, illus. April 1945. 99.81 B77

Includes a review of technical developments in aerial dusting and spraying against forest insects, with a discussion of types of aircraft, equipment, and insecticides. Describes the rotary and nonrotary types of atomizers developed to meet the requirements of concentrated sprays. Illustrations show rotating disc atomizer, alone and mounted on a White Standard biplane.

HALL, D. G. (1047)
AERIAL DDT, EMERGENCY MEASURE FOR CONTROL OF MOSQUITO-BORNE EPIDEMICS. Air Surgeon's Bul. 2 (3): 71–73, illus. March 1945. Army Med. Libr. (Restricted war material)

HOLBROOK, S. (1048)
LOOPERS IN THE BIG TIMBER. WHAT HAPPENED THIS SUMMER IN THE OREGON WOODS WHEN DDT WAS TURNED AGAINST THE HEMLOCK LOOPER [LAMBDINA FISCELLARIA], HUNGRY ENEMY OF BIG TIMBER. Amer. Forests 51 (10): 476–479, 519–520. Oct. 1945. 99.8 F762

In September of 1944, following reports from the Crown Zellerbach Corporation, Robert Furniss of the U. S. Bureau of Entomology and Plant Quarantine mapped the infested areas by airplane. When the spring-laid eggs had hatched in May and June of 1945, the commercial firm, Central Aircraft, was engaged to start spraying work. Waco biplanes were used. Twenty minutes after application of DDT (1 lb. DDT to 2 gals. fuel oil), small, green worms began to fall on the test screens. Average mortality per acre is estimated at over 4,000,000 larvae. In comparative tests, arsenate of lead proved effective but much slower in action. One pound of DDT will cover an acre of forest. There was no damage to birds or bees.

JONES, H. A., LINDQUIST, A. W., DEONIER, C. C., and HUSMAN, C. N. (1049)
DISPERSION OF DDT SPRAYS FROM FAST COMBAT AIRCRAFT. Jour. Econ. Ent. 38 (6): 691–693. December 1945. 421 J822

Preliminary tests were made between Dec. 3, 1943 and Mar. 1, 1944 to prove the feasibility of controlling houseflies and mosquitoes in forward combat areas. A detailed description is given of the Chemical Warfare Service M–10 tank which can be attached to any type of fast combat plane. Nine flights were made to test DDT sprays and five to study spray distribution. Effective swath widths varied from 150 to 400 yds. Under test conditions, a plane flying at right angles to the wind gives good control of insects over about 30 acres if one tank (27.5 gals.) of 5-percent DDT solution is released to lay a 200 yd. effective swath and a linear coverage of 700 to 800 yds. A better control was obtained with a 10-percent solution which compensated for the uneven deposit with this type of equipment. The increased toxicity to wildlife would not be of importance under combat conditions. Although not entirely suitable, the equipment described was readily available and satisfactory for use until a special type could be designed.

KERNAN, H. S. (1050)
FIGHTING TREE KILLERS WITH DDT; A MIRACLE INSECTICIDE PROMISES GREAT THINGS IN THE CONTROL OF TREE INSECTS. Amer. Forests 51 (1): 111–112, 143, 144, illus. March 1945. 99.8 F762

Successful airplane applications of DDT were made in 1944 against *Archips fumiferana* and *Porthetria dispar*. In the spring of 1945 experiments will be made (over 5,000 acres of Canadian woodland) in which the U. S. Bureau of Entomology and Plant Quarantine and the U. S. Forest Service will cooperate. Refers to a special device developed by the U. S. Bureau of Entomology and Plant Quarantine by which the spray mixture is atomized as it is fed from the tank. Problems to be solved are: (1) locating the most

suitable type of plane, (2) improving spraying devices, (3) establishing correct dosages and proper seasons for each insect pest, (4) developing a scheme for marking swaths to avoid overlapping.

LESLIE, A. P. (1051)
DDT IN ONTARIO'S FORESTS. Canad. Geog. Jour. 31 (4): 186–197, illus. October 1945. 470 C162

In 1944 the Ontario Department of Lands and Forests started experiments in Algonquin Park using an autogiro and an airplane loaned by the U. S. Department of Agriculture. These preliminary tests against *Archips fumiferana* attempted to determine the toxicity to animal life and to insects other than *Archips*, of DDT in solutions of varying strength. Detailed results are given. A special spray device was developed by Dr. T. R. Loudon to solve the problem created by the low viscosity of DDT sprays. Large-scale work was begun in May 1945 over spruce and balsam stands in the Nipigon Park area of Port Arthur. The R. C. A. F. used four Canso amphibian planes equipped with the Loudon device in making all flights. All personnel handling DDT solution were provided with masks, gloves, and overalls. Plane crews, all experienced men, were given photographic maps with the 64,000 acres to be sprayed marked in strips. Plots were marked with meteorological balloons. Spraying was found impracticable with wind velocities over 15 miles per hr., and unfavorable weather conditions delayed the work. In 300 hrs. of operational flight, 7,000 gals. of spray (DDT in kerosene or Diesel oil) were used at the rate of slightly over 1 gal. per acre. Final results are not known but a 66 to 70 percent kill is indicated. The importance of regular airplane surveys to spot insect outbreaks in early stages is emphasized. Illustrations show planes, spray device, accessory ground equipment, and maps of areas treated.

LINDQUIST, A. W., MADDEN, A. H., HUSMAN, C. N., and TRAVIS, B. V. (1052)
DDT DISPERSED FROM AIRPLANES FOR CONTROL OF ADULT MOSQUITOES. Jour. Econ. Ent. 38 (5): 541–544, illus. October 1945. 421 J822

A report on experiments made on the Keys near Key West, Fla., during November and December of 1943. An attempt was made to estimate the value of sprays against adult mosquitoes in jungle areas. Five percent DDT sprays, dispersed from a Cub plane at the rate of 2 to 3 qts. per acre, proved very effective against *Aedes taeniorhynchus* in dense cover. A reduction of 99 percent was obtained in some instances. Methods for estimating results are described. Data obtained indicate the possibility of controlling disease-bearing insects ahead of advancing troops. A DDT dust was not successful against adult mosquitoes. Author suggests that they were not sufficiently disturbed by airplane application to fly and thus contact the insecticide. Excellent results were obtained when 20-percent DDT in cyclohexane and motor oil was injected into a specially constructed exhaust pipe to form a combination smoke and spray. Five percent of DDT in motor oil was not satisfactory.

——— and MCDUFFIE, W. C. (1053)
DDT-OIL SPRAYS APPLIED FROM AN AIRPLANE TO CONTROL ANOPHELES AND MANSONIA MOSQUITOES. Jour. Econ. Ent. 38 (5): 545–548. Oct. 1945. 421 J822

In 1944, jungle forest areas in the Panama Canal Zone were treated with 10 percent DDT in oil dispersed from a Cub airplane equipped with a portable spray unit. A mortality of 98 to 100 percent of adult *Anopheles albimanus* and 98 percent of *Mansonia* spp. was obtained during the first test in a 4-day period. Adults began to infiltrate from surrounding areas after 6 days, and 21 days after treatment there was no difference in the populations of the treated and untreated areas. The larvae of both *Anopheles* and *Culex* were also controlled. An adult mortality of 90 to 98 percent was observed 2 days after spraying in the second test. These experiments constituted the first proof of the value of airplane spraying against adult mosquitoes over jungle forests, established this method as a real factor in malaria control under certain military conditions, and acted as a stimulant to further research with all types of planes.

Lizer y Trelles, C. A. (1054)
LA AVIACIÓN Y LA LANGOSTA. Res 13: 17878–17879. Aug. 20, 1945. 286.85 R31

Urges organized locust control program by Argentine government using airplane distribution of a dinitro-o-cresol dust.

Loftin, U. C., comp. (1055)
RESULTS OF TESTS WITH DDT AGAINST COTTON INSECTS IN 1944. U. S. Bur. Ent. and Plant Quar. E–657, 6 pp. [Washington, D. C.] 1945. [Processed.] 1.9 En83

Includes results of airplane dusting experiments carried out in Arizona against mixed populations of several species of plant bugs and stinkbugs. Results were better with a DDT-pyrophyllite-sulfur dust than with arsenical-sulfur mixtures. Marked increases were noted in the number of lbs. of seed cotton produced per acre.

Logue, J. B. and O'Connell, H. V. (1056)
DDT; PRACTICALITY OF USE DURING INVASION. U. S. Bur. Med. and Surg. U. S. Nav. Med. Bul. 44 (4): 877–882. Apr. 1945. 153.45 Un3

Includes aerial spraying experiments. This method proved valuable for the control of mosquitoes and was a useful adjunct to sanitary measures against flies. It must be employed early in the campaign. Cub-type planes are not practical for large-scale operations. When combat planes TBF and TBM are used, there should be no delay waiting for captured airfields to become available, but work should be started from carriers prior to and during assault phases.

McClintock, J. A., and Fisher, W. B. (1057)
SPRAY CHEMICALS AND APPLICATION EQUIPMENT. 320 pp., illus. Chicago, Greenlee Co., Inc., in collaboration with Waddell Printing Co., Lagrange, Ind., 1945. 423 M13

The Airplane Duster, pp. 297–301. Defines and illustrates special equipment. Lists advantages and disadvantages of airplane dusting.

McPeak, D. H. (1058)
DDT SPRAYING; EXPERIMENTS IN THE FIELD. Air Surgeon's Bul. 2 (3): 74–76, illus. Mar. 1945. Army Med. Libr. (Restricted war material)

Madden, A. H., Lindquist, A. W., and Knipling, E. F. (1059)
DDT TREATMENT OF AIRPLANES TO PREVENT INTRODUCTION OF NOXIOUS INSECTS. Jour. Econ. Ent. 38 (2): 252–254. April 1945. 421 J822

Laboratory and field tests showed that under experimental conditions DDT residue treatments were effective against mosquitoes and houseflies for at least six weeks. Materials used in airplanes in operational use were: 5 and 20 percent DDT in various formulas in kerosene solutions; 20 percent DDT in an aqueous solution; 50 percent DDT in talc as a dust; aerosols (5 percent DDT, 0.2 percent pyrethrins). Although dusts were more easily applied, the toxic effects of sprays proved more lasting. A 2-hr. exposure of a 20-percent concentration of DDT, applied as a fine mist, gave the best results. The equipment used is described. Neither the occupants nor the interior of the plane were adversely affected by the treatments.

Magath, T. B., and Knies, P. T. (1060)
MODERN CONCEPTS OF INTERNATIONAL QUARANTINE WITH SPECIAL REFERENCE TO MILITARY TRAFFIC. Mil. Surg. 96 (3): 209–222. March 1945. 448.8 M59

Includes discussion of the transportation of insect disease vectors and the disinfestation of ships and aircraft. Stresses proper supervision of flight crews and education of the passengers.

Metcalf, R. L., Hess, A. D., Smith, G. E., Jeffery, G. M., and Ludwig, G. W. (1061)
OBSERVATIONS ON THE USE OF DDT FOR THE CONTROL OF ANOPHELES QUADRIMACULATUS. U. S. Pub. Health Serv. Rpts. 60: 753–774. July 6, 1945. 151.65 P96

A detailed report which includes airplane experiments carried out by the Tennessee Valley Authority during the summers of 1943 and 1944. It was

necessary to dilute DDT powder with 95 percent of soapstone to obtain a satisfactory dusting mixture. Although it gave 90 percent control over 200-ft. swaths with a low dosage rate (0.05 lb. per acre), the decrease in pay load caused by the high percentage of inert diluent made it unsatisfactory. Tests with sprays showed the need for a satisfactory solvent for DDT, and certain polymethylnaphthalenes (Velsicols) having a high boiling point proved ideal. A 90 percent kill over swaths 200 to 300 ft. wide was obtained with 15 to 20 percent solutions of DDT in Velsicol when applied at rates as low as 0.03 lb. Stearman planes, with their greater pay load and increased swath width, were more satisfactory than Cub planes. Thermal aerosols, produced from concentrated solutions of DDT in Velsicol by special equipment attached to a Stearman plane, gave at least 90 percent larval mortality over 300-ft. widths when used at the low rate of 0.4 lb. of DDT per acre. This equipment was also used successfully against adult mosquitoes by application of about 0.5 lb. of DDT per acre. Neither dusts nor aerosols caused injury to fish or other aquatic organisms at the rate of 0.1 lb. DDT per acre. Five percent solutions in kerosene used at 0.25 lb. DDT per acre killed many aquatic insects.

NORRIS, F. T. (1062)
THE FLYING FLIT GUN. Hosp. Corps Quart. 18 (4): 2–3. April 1945. 153.45 Un3

Spraying mosquito breeding places with DDT by airplane.

PALM, C. E. (1063)
NEW INSECT-CONTROL METHODS STUDIED. CONCENTRATED SPRAYS AND INSECTICIDE APPLICATION FROM PLANES SHOW PROMISE. Farm Res. [N. Y. State Sta.] 11 (4): 16, illus. Oct. 1, 1945. 100 N48A

PARKER, R. L. (1064)
LOCATE BEES BY AIRPLANE. Kans. Farmer 82 (5): 8. Mar. 3, 1945. 6 K13

Selection of summer apiary sites.

PEMBERTON, C. E. (1065)
ENTOMOLOGY. A REPORT. Hawaiian Sugar Planters' Assoc. Com. Charge Expt. Sta. Rpt. 1943/44: 17–21. *In* Hawaiian Sugar Planters' Assoc. Ann. Mtg. (1944) Rpt. 64. Honolulu, 1945. 65.9 H314

Quarantine—Project E–9, pp. 19–21. Planes from outside the Hawaiian Islands were inspected on arrival at Oahu airports. Between Oct. 1, 1943, and Sept. 30, 1944, a total of 5,125 insects were collected from Army and Navy planes. Of the 173 found alive, only 5 were species not known to Hawaii, and none were potentially dangerous. The injurious species found among the dead specimens are listed with comments. The U. S. Navy is much concerned over the possible transmission of new insect pests, especially mosquito vectors of malaria, and is assisting the Entomology Department in a cooperative survey of insects now found in the Oahu lowlands.

QUACKENBUSH, A. (1066)
MAN-MADE "BUG" SLAYS BUGS. Esso Farm News 4 (6): 18–19. November 1945. 6 Es72

Use of the helicopter to spray farm crops with DDT.

SCHREUDER, O. B., and SULLIVAN, W. N. (1067)
SPRAYING OF DDT FROM AIRPLANES. Air Surgeon's Bul. 2 (3): 67–68, illus. March 1945. Army Med. Libr. (Restricted war material)

SCOTT, L. B. (1068)
ARSENICAL RESIDUES IN STRAW AND GRAIN FROM WHEAT DUSTED BY AIRPLANE OR TREATED WITH POISONED BAIT. Jour. Econ. Ent. 38 (4): 464–466. August 1945. 421 J822

Either method was effective against *Cirphis unipuncta*, infestation being reduced by about 90 percent in 72 hrs. Deaths were later reported among cats, dogs, and other animals, and toxic effects from eating arsenical residues were also reported in cattle. Analyses of straw and grain from treated fields were made. Results are compared with known arsenical tolerances of cattle and horses. Residues were not found to approach dangerous amounts.

SHIKHOV, N. I. (1069)
PROTIVOMALÎARIĬNOE OPYLENIE RISA V FAZE T͡SVETENIÎA [ANTIMALARIAL DUSTING OF RICE DURING ITS BLOSSOMING TIME]. Med. Parazitol. i Parazitar. Bolezni 14 (3): 89–92. 1945. [In Russian.] 448.8 M469

In 1939 the Krasnodar Regional Malaria Station carried out tests at the All-Union Rice Experiment Station to determine the dosage which would kill mosquitoes and yet not injure rice plants nor reduce rice yields. Paris green in dosages of 0.3, 0.5, and 0.7 kg. per ha. was used to prevent mosquito breeding. The results showed that 0.3 kg. per ha. is effective and causes no injuries; 0.5 kg. injures the plant. The dust should be applied in the early morning hours.

SIGANUR and BAGIRA. (1070)
REZUL'TATY PRIMENENIÎA TIODIFENILAMINA V AVIAOPYLENIÎAKH PO KHAR'KOVSKOĬ OBLASTI [RESULTS OF USING THIODIPHENYLAMINE IN AIRCRAFT DUSTING OF ANOPHELES BREEDING PLACES IN THE KHAR'KOV REGION]. Med. Parazitol. i Parazitar. Bolezni 14 (4): 79–81. 1945. [In Russian.] 448.8 M469

In 1944 the Khar'kovskaîa Oblastnaîa Malîariĭnaîa Stant͡siîa conducted aircraft dusting experiments. The nature of the terrain and its effect on dusting technique and on dust coverage are discussed. Detailed table shows results of treating selected breeding places. It is concluded that, in areas of scant vegetation, effective mortality results from a dosage of 1 kg. per ha.; where heavy vegetation is present, the dosage should be increased to 1.2–1.5 kg. per ha.

STRONG, F. C., and RASMUSSEN, E. J. (1071)
COST STUDIES SHOW AIRPLANE DUSTING IS PRACTICAL. Food Packer 26 (13): 63–64, 66, illus. December 1945. 286.83 C165

Results of a year's experiments on airplane dusting of orchard trees. Discusses equipment and personnel required, comparative cost of airplane dusting and ground spraying, effect of wind on operations, improvements needed in apparatus and dusting materials. Concludes that satisfactory control of orchard insects and diseases can be obtained by airplane dusting at a reasonable cost.

TARABUKHIN, I. A., and VANSHTOK, A. P. (1072)
K OBOSNOVANIÎU AVIAOPYLITEL'NYKH RABOT NA PROTIVOPOLOZHNOM BEREGU NASELENNOGO PUNKTA, RASPOLOZHENNOGO NA BOL'SHOĬ REKE [AIRCRAFT DUSTING ON THE BANK OPPOSITE A POPULATED LOCALITY SITUATED ON A LARGE RIVER]. Med. Parazitol. i Parazitar. Bolezni 14 (2): 75–76. 1945. [In Russian.] 448.8 M469

Flight of marked mosquitoes from breeding places across the Ob river from the Berdsk village proved need for dusting operations in the Novosibirsk Region.

TRINCHIERI, G. (1073)
AIR TRANSPORT AND PHYTOSANITARY CONTROL. Internatl. Inst. Agr. Internatl. Bul. Plant Protect. 19 (1/2): 1M–16M. Jan./Feb. 1945. 464.8 In8

Reprinted from the International Review of Agriculture.

Points out the danger caused by relaxation of regulations under wartime conditions and by greatly increased transportation of foodstuffs and agricultural raw material from country to country. Reviews literature on transportation of plant pests and diseases by aircraft and on protective measures against them. Advocates international cooperation.

References.

UNITED STATES BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE. (1074)
REPORT OF THE CHIEF . . . BY P. N. ANNAND (1943/1944). 87 pp. Washington, D. C., U. S. Govt. Print. Off., 1945. 1 En82

Aerial application of concentrated sprays (including DDT) against *Porthetria dispar* on forest and shade trees, pp. 7–8, 34–35; airplane control of *Pyrausta nubilalis*, p. 12; dusting sugarcane with cryolite to control *Diatraea saccharalis*, p. 13; dusting cotton with nicotine preparations against *Aphis gossypii*, p. 16; airplane inspection, pp. 52–53.

Consult earlier reports for previous records, beginning with the report of L. O. Howard for 1922/23, which contains a statement on the inauguration of airplane dusting.

——— (1075)
THE USE OF AIRCRAFT IN THE CONTROL OF CROP PESTS, 4 pp. [1945? Processed.] 1.967 A2Us2

Brief summary which includes equipment, licensing of aircraft, and insecticidal materials.

——— AND LOUISIANA AGRICULTURAL EXPERIMENT STATION (1076)
RECOMMENDATIONS FOR THE CONTROL OF THE SUGARCANE BORER IN LOUISIANA IN 1945 BY DUSTING WITH CRYOLITE. Sugar Bul. 23 (13): 101. Apr. 1, 1945. 65.9 Am32

Includes airplane treatment of large-scale areas. For both first and second generation larvae of *Diatraea saccharalis*, dust should be applied 4 times at weekly intervals between 6 p. m. and 9 a. m., laying a swath not over 36 ft. wide. About 8 to 10 lb. of dust should be used per acre for first generation borers, and about 10 lb. for second.

UNITED STATES NAVY. BUREAU OF MEDICINE AND SURGERY. (1077)
MANUAL OF THE MEDICAL DEPARTMENT. U. S. Navy. Nav Med 117, rev., 605 pp. Washington, D. C., U. S. Govt. Print Off., 1945. 153.46 M31

Procedures relating to aircraft quarantines, including disinfestation of aircraft, pp. 410–414.

UNITED STATES PUBLIC HEALTH SERVICE. OFFICE OF MALARIA CONTROL IN WAR AREAS. (1078)
MALARIA CONTROL IN WAR AREAS 1944–45. 134 pp. illus. [Washington, D. C., 1945? Processed.] Natl. Inst. of Health Libr.

Includes accounts of mosquito control by: Airplane application of DDT "thermal aerosols," p. 45; airplane dusting with paris green or DDT, pp. 61–62, 67, 79, 111, 123; airplane spraying with DDT, p. 79.

UNITED STATES TENNESSEE VALLEY AUTHORITY. (1079)
ANNUAL REPORT 11 (1943/1944). 180 pp. [Washington, D. C., 1945?] 173.2 T25A

Control of *Anopheles quadrimaculatus* by use of dusts and sprays, including tests with DDT, applied by airplane, pp. 40–41.

UNITED STATES WAR DEPARTMENT. (1080)
DDT INSECTICIDES AND THEIR USES. U. S. War Dept. Tech. Bul. TB Med 194, 32 pp., illus. Washington, D. C., 1945. 152.1 D11

Summarizes results of experiments in the United States and in combat areas. Discusses and illustrates special equipment devised for airplane use including the Husman-Longcoy sprayer for the L–4 plane (Piper Cub), and a vertical discharge pipe for use with B–25 or C–47 planes. Special factors, such as meteorologic conditions and type of vegetation, are also considered. The following conclusions are reached: (1) Application of DDT sprays by aircraft is highly effective against both larvae and adults of mosquitoes, and to a lesser degree against flies; (2) present methods do not give a prolonged residual effect; (3) it is a necessary military weapon under certain stated conditions; (4) due regard should be paid to hazards to beneficial insects, agriculture, and wildlife except in combat areas. Includes brief reference to the use of DDT aerosols in the disinfestation of aircraft.

WELKER, J. (1081)
MORE COTTON WITH DDT. Ariz. Farmer 24 (4): 4–5, illus. Feb. 24, 1945. 6 Ar44

Airplane dusting with DDT on the Goodyear Farms, Litchfield Park, Ariz., in 1944, gave promising results. No definite conclusions can yet be drawn as to correct dosages. Quality of the cotton produced appeared slightly better than in untreated check plots. This was a cooperative experiment with the U. S. Bureau of Entomology and Plant Quarantine.

WHITE, H. R., and GRAFFEO, M. L. (1082)
USE OF DDT IN THE FIELD. Hosp. Corps Quart. 18 (12): 37–39, illus. December 1945. 153.45 Un3

States that the best all-purpose solution for field use is 5 percent of DDT powder in No. 2 Diesel oil, and gives directions for mixing. Includes detailed description of apparatus developed for use with PBJ type airplane. Test flights were made to establish procedure for aerial spraying.

WHITNALL, R. (1083)
AIRPLANE SPRAYING LATEST WAY TO GET WORK DONE EFFICIENTLY AND WITH AMAZING SPEED. Better Fruit 40 (5): [7]–9. November 1945. 80 B46

Concerns the development and work of Central Aircraft of Yakima, Washington. Includes brief details of operations against *Lambdina fiscellaria* carried out in Clatsop County, Oregon, during the 1945 season.

WISECUP, C. B., BROTHERS, W. C., and EIDE, P. M. (1084)
AIRPLANE SPRAYING OF RICE FIELDS WITH DDT TO KILL MOSQUITO LARVAE. Jour. Econ. Ent. 38 (6): 686–688. December 1945. 421 J822

Tests were made during the summer of 1944 over more than 700 acres of rice fields near Stuttgart, Ark., to control larvae of *Anopheles* and *Psorophora*. The liaison-type planes L–2 (Taylorcraft), L–3 (Aeronca), L–4 (Piper Cub) proved equally satisfactory when fitted with the Husman-Longcoy portable spray unit. An aqueous emulsion containing from 5 to 10 percent of DDT, made from a concentrate (25 percent of DDT, 68 percent of Xylene, and 7 percent of Triton X–100) was laid in swaths 40 ft. wide. Planes flew across the wind, working up wind, and the line of flight was marked by flagmen. Dosages of 0.1–0.2 lb. of DDT per acre gave good mortality of *Anopheles* and *Psorophora* larvae; over 0.5 lb. per acre gave control for about a month; preflooding treatments of less than 0.5 lb. per acre were not effective against the *Anopheles*, but were satisfactory for the *Psorophora*. Army Air Forces pilots had no difficulty in the type of flying required for mosquito control in open country. None of these applications caused damage to rice plants.

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