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Library List No. 49 Washington 25, D. C., August 1949

PHYSICAL RISKS IN FARM PRODUCTION

Selected References, 1930-1948

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CONTENTS

INTRODUCTION

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The risks of farm production are a major source of instability in American agriculture with far-reaching effects on the economic organization and financial success of individual farms. Weather risks, in particular, have given rise to serious problems. In the Great Plains, during the period of the 1930's, the repeated occurrence of unfavorable weather caused economic survival to become critical for many of the farms in this area. In all farming areas a wide variety of natural hazards must be assumed by those engaged in farm production.

Agricultural risk, as a field of research, is in need of further development. Previous studies in this field have dealt with the problems involved in insuring farm risks, but little attention has been directed to risk from the standpoint of the individual farm. The effects of risk on the organization and functioning of the farm business, and on the income of the farm family deserve careful study. It is hoped that this bibliography will prove useful to those who become actively interested in these problems.

PREFACE

This bibliography is intended to serve students and research workers who are interested in the economic problems that arise from the risks of farm production. Yield risks from insects, diseases, and adverse weather, the risk of livestock losses, property losses from fire and lightning, and the personal risks of accident and sickness constitute major classes of natural hazards that are of economic importance in farm operation.

Two types of references have been included. One type consists of references with information on the nature of the hazards, their frequency of occurrence, and the extent of the losses realized under various conditions of farming. These are listed by specific risks. The other type concerns the economic incidence of risk and its effect on the structure and functioning of the farm enterprise. The references in the latter category were selected largely in terms of whether they appeared to have value for those interested in research on the economic implications of risk. Hence this category includes a rather complete listing of references from the current literature of economic theory.

The United States Department of Agriculture has previously issued three lists of references on crop and livestock insurance: Agricultural Economics Bibliography No. 67, Crop and Livestock Insurance, a Selected List of References to Literature issued since 1898; Economic Library List No. 24, Crop and Livestock Insurance, 1937-1940; and Library List No. 47, Crop and Livestock Insurance, 1941-1948, A Selected List of References. References on insurance, therefore, have not been included in the present list.

The literature from 1930 to 1948, inclusive, has been searched for references in the English language. The principal sources consulted were as follows:

Card catalog, U. S. D. A. Library
Agricultural Economics Literature, 1930-1942.
Agricultural Index, 1931/33-December, 1948.
Bibliography of Agriculture, July 1942-December 1948.
Experiment Station Record, 1930-1946.
Cumulative Book Index, 1928/32-November 1948.
Index to the Publications of U. S. D. A., 1931/35, 1936/40.
Industrial Arts Index, 1931-November 1948.
Public Affairs Information Service Bulletin, 1930-1948.
Agricultural Economics Bibliography No. 67, 59, 70, 85.
Economic Library List No. 24
Index to the Literature of American Economic Entomology, 1935/39-1945/48.
Library List No. 2 (rev.), 14.
American Economic Review, 1930-1948.
American Society of Farm Managers and Rural Appraisers Journal, 1937-1948.
Economic Annalist, 1931-1948.
Economica, 1930-1948.
Journal of Farm Economics, 1930-1948.
Journal of Political Economy, 1930-1948.
Monthly Weather Review, 1930-1948.
Plant Disease Reporter and Supplements, 1930-1948.
Halcrow, H. Selected bibliography on crop insurance. (From Ph.D. Thesis, unpublished, 9-28-48).
Malin, J. C. The grassland of North America; prolegomena to its history. Lawrence, Kans., 1947. 398 p. Ref. 463.89 M29
U. S. Bur. of Agricultural Economics. Div. of Farm Population and Rural Welfare. Social security for farm people; a list of references, compiled by J. C. Folsom. Washington, 1944. 9 p. 1.941 R7So12
U. S. Bur of Plant Industry. Div. of Dry Land Agriculture. Publications containing information on soil moisture and soil erosion issued as a result of cooperative investigations by the Division of Dry Land Agriculture of the Bureau of Plant Industry and State Agricultural Experiment Stations, compiled by J. S. Cole. [Washington, 1940] 14 p. 1.965 D3P96
U. S. Library of Congress. Div. of Bibliography. Safety measures; a selected list of recent references on accident prevention in its various aspects, compiled by A. L. Baden. Washington, 1942. 56 p. 241.3 Un3S
U. S. Special Committee on Farm Tenancy. Farm tenancy; report of the President's Committee. Washington, 1937. 108 p. Ref. 173.2 F22F
U. S. Weather Bur. Library. Selected bibliography on meteorology and related subjects. Washington, 1943. 31 p. 157.991 Se4

THE CONCEPT OF RISK

Risk in Economic Theory

1. DOMAR, E. D., and MUSGRAVE, R. A. Proportional income taxation and risk-taking. Q. J. Econ. 58: 388-422. May 1944. 280.8 Q2

2. FELLNER, W. Monetary policies and hoarding in periods of stagnation. J. Polit. Econ. 51: 191-205. Ref. June 1943. 280.8 J82

Sect. 111, Entrepreneur expectations and probability judgments.

3. FRIEDMAN, M., and SAVAGE, L. J. The utility analysis of choices involving risk. J. Polit. Econ. 56: 279-304. Aug. 1948. 280.8 J82

"The purpose of this paper is to suggest that an important class of reactions of individuals to risk can be rationalized by a rather simple extension of orthodox utility analysis."

4. HAHN, F. H. A note on profit and uncertainty. Economica (n. s.) 14: 211-225. Aug. 1947. 280.8 Ec73

5. HARDY, C. O. Risk and risk-bearing. Chicago, U. Chicago Press, 1937. 364 p. 280 H22R

Partial contents: Ch. 1, Forms and extent of business risk; Ch. 2, Ways of dealing with risk: elimination of the risk; Ch. 3, Ways of dealing with risk: transfer to owner-managers; Ch. 4, Ways of dealing with risk: transfer to specialists.

6. HART, A. G. Anticipations, business planning and the cycle. Q. J. Econ. 51: 273-297. Feb. 1937. 280.8 Q2

Includes a discussion of the implications of market uncertainty for business planning.

7. HART, A. G. Anticipations, uncertainty, and dynamic planning. J. Business U. Chicago 13(4, pt. 2), 98 p. Oct. 1940. 280.8 J825

Formulates the theory of the firm under conditions of uncertainty, including a detailed analysis of "capital rationing" and flexibility.

8. HART, A. G. Risk, uncertainty, and the unprofitability of compounding probabilities. In Studies in mathematical economics and econometrics in memory of Henry Schultz, p. 110-118. Ref. Chicago, U. Chicago Press, 1942. 280 St93

9. HART, A. G. Uncertainty and inducements to invest. Rev. Econ. Studies 8: 49-53. Oct. 1940. 280.8 R329

See also item 32.

10. HICKS, J. R. The theory of uncertainty and profit. Economica 11: 170-189. Ref. May 1931. 280.8 Ec73

"There are thus three main ways by which, in organised society, risks may be dealt with. (1) As a result of economic organization, the risks inhering in particular processes may be reduced. (2) The resultant or effective risks may be borne by certain persons in return for fixed payment. (3) The effective risks may be borne for a payment whose amount will vary with the return given by the operation in question," (p. 173).

11. HICKS, J. R. Value and capital; an inquiry into some fundamental principles of economic theory. Oxford, Clarendon Press, 1939. 331 p. 284 H522

In developing a theory of dynamic economics, the author discusses the significance of risk on p. 125-126, 134, 200 and 225.

12. HURWICZ, L. Theory of the firm and of investment. Econometrica 14: 109-136. Ref. Apr. 1946. 280.8 Ec78

13. KALDOR, N. The equilibrium of the firm. Econ. J. 44: 60-76. Mar. 1934. 280.8 Ec72

"The term 'entrepreneurship' as a factor of production is somewhat ambiguous - or rather more than ambiguous, possessing as it does at least three distinct meanings. What is generally called the 'entrepreneurial function' can be either (1) risk - or rather uncertainty-bearing; or (2) management, which consists of two things: (a) supervision, (b) co-ordination" (p. 67).

14. KALECKI, M. The principle of increasing risk. Economica (n. s.) 4: 440-447. Nov. 1937. 280.8 Ec73

The marginal rate of risk is an important factor in determining the size of investment undertaken by an entrepreneur.

Risk in Economic Theory--Continued.

Comment by N. S. Buchanan and R. D. Calkins in Economica 5: 455-458. Nov. 1938; reply, p. 459-460.

A revision appears as Ch. 4 of his Essays in the Theory of Economic Fluctuations. London, 1939. 280 K12

15. KNIGHT, F. H. Risk. Encyclopedia of the Social Sci. 13: 392-394. Ref. Nov. 1937. 280 En1

In agriculture "the unpredictability of the course of nature introduces serious technological risks. Such risks, however, tend to cancel out in the course of time or can be largely eliminated by some form of insurance" (p. 392).

16. KNIGHT, F. H. Risk, uncertainty, and profit. London, 1933. 381 p. (London School of Econ. and Polit. Sci. Reprints of Scarce Tracts in Econ. and Polit. Sci. 16) Libr. Cong.

Preface to the re-issue, p. xi-xxxvi.

Since the appearance of the first edition in 1921, this work has been widely accepted as a formulation of the theory of risk and uncertainty.

17. LACHMANN, L. M. A note on the elasticity of expectations. Economica (n. s.) 12: 248-253. Ref. Nov. 1945. 280.8 Ec73

18. LACHMANN, L. M. The role of expectations in economics as a social science. Economica (n. s.) 10: 12-23. Feb. 1943. 280.8 Ec73

19. LANGE, O. R. Price flexibility and employment. Bloomington, Ind., Principia Press, 1944. 114 p. (Cowles Comn. for Res. in Econ. Monogr. 8) 280 L262P

Partial contents: Ch. 6, Uncertainty; Ch. 12, Innovations. Part of the latter chapter was published under the title "A Note on Innovations" in Rev. Econ. Statis. 25: 19-25. Feb. 1943. 251.8 R32

20. LINDAHL, E. Studies in the theory of money and capital. New York, Farrar & Rinehart, 1939. 391 p. 284 L643

Uncertainty and planning is discussed (p. 40-51, 348-350).

21. LITTLE, L. T. Economics and insurance. Rev. Econ. Studies.5: 32-52. Ref. Oct. 1937. 280.8 R329

"The theory of risks can be applied to the problem of the determination of the demand and supply conditions of insurance" (p. 32).

22. MAKOWER, H., and MARSCHAK, J. Assets, prices and monetary theory. Economica (n. s.) 5: 261-288. Aug. 1938. 280.8 Ec73

Uncertainty is defined. "People do not know, they can only guess at, the yields they will be able to get from their properties, whether by productive activity or by future exchange. The yields must be expressed as an array of more or less probable quantities, that is as a frequency distribution".

23. MARSCHAK, J. Money and the theory of assets. Econometrica 6: 311-325. Oct. 1938. 280.8 Ec78

Includes a section on uncertainty.

24. MARSCHAK, J. Neumann's and Morgenstern's new approach to static economics. J. Polit. Econ. 54: 97-115. Apr. 1946. 280.8 J82

Reviews and appraises some of the types of analysis presented in "The Theory of Games and Economic Behavior," by John Von Neumann and Oskar Morgenstern (Princeton, Princeton U. Press, 1944).

Application of the analysis to problems of risk and uncertainty is considered in Sect. 3, "Risk, Uncertainty and Utility."

25. MOWBRAY, A. H. Insurance, its theory and practice. Ed. 2. New York, McGraw-Hill, 1937. 634 p. 284.6 M87

Ch. 1, Risk, Its Nature and Economic Significance, contains a definition of risk. Risks in agriculture are mentioned, p. 138-144, 557.

26. PIGOU, A. C. The economics of welfare. Ed. 4. London, Macmillan, 1938. 837 p. 280 P62

Appendix 1, Uncertainty-bearing as a Factor of Production.

27. ROSENSTEIN-RODAN, P. N. The role of time in economic theory. Economica (n. s.) 1: 77-97. Feb. 1934. 280.8 Ec73

28. SHACKLE, G. L. S. An analysis of speculative choice. Economica (n. s.) 12: 10-21. Feb. 1945. 280.8 Ec73

Risk in Economic Theory--Continued.

29. SHACKLE, G. L. S. The expectational dynamics of the individual. Economica (n. s.) 10: 99-129. May 1943. 280.8 Ec73

30. SHACKLE, G. L. S. Expectations, investment, and income. London, Oxford U. Press, 1938. 119 p. Libr. Cong.

31. SHACKLE, G. L. S. Nature of the inducement to invest. Rev. Econ. Studies 8: 44-48. Oct. 1940. 280.8 R329

32. SHACKLE, G. L. S. A reply to Professor Hart. Rev. Econ. Studies 8: 54-57. Oct. 1940. 280.8 R329
See item 9.

33. STEINDL, J. Capitalist enterprise and risk. Oxford Econ. Papers 7: 21-45. Ref. Mar. 1945. 280.8 Ox2

34. STEINDL, J. On risk. Oxford Econ. Papers 5: 43-53. Ref. June 1941. 280.8 Ox2

35. STIGLER, G. Production and distribution in the short run. J. Polit. Econ. 47: 305-327. June 1939. 280.8 J82
A modification of the short-run theory of costs to take into account "divisibility" and "adaptability" of fixed plant. The problem of building flexibility into the plant is discussed.

36. SWEEZY, P. M. Expectations and the scope of economics. Rev. Econ. Studies 5: 234-237. Ref. June 1938. 280.8 R329

37. TINTNER, G. A contribution to the nonstatic theory of production. In Studies in mathematical economics and econometrics in memory of Henry Schultz, p. 92-109. Ref. Chicago, U. Chicago Press, 1942. 280 St93

38. TINTNER, G. The pure theory of production under technological risk and uncertainty. Econometrica 9: 305-312. July-Oct. 1941. 280.8 Ec78

39. TINTNER, G. The theory of production under nonstatic conditions. J. Polit. Econ. 50: 645-667. Ref. Oct. 1942. 280.8 J82
Supplements his "A Contribution to the Nonstatic Theory of Production."

40. VALGREN, V. N. The farm-risk problem. J. Amer. Ins. 22(1): 16-17, 22-23. Jan. 1945. 284.68 J822
"By risk is meant... a greater or less probability or chance of loss," caused by an unfriendly agency usually called a hazard. Hazards affecting buildings include fire, lightning, windstorm, hail, explosion, and, in some localities, earthquake. Those affecting equipment include, in addition, robbery or theft. Livestock losses are caused by disease or accident, in addition to hazards mentioned above. Crops may fail because of weather conditions, disease, insect pests or animal pests. The farmer also has personal risks of death, accident or loss of health. Insurance against such risks is discussed.

41. VALGREN, V. N. Insurance and the farm-risk problem. Agr. Finance Rev. 7: 1-8. Nov. 1944. 1.9 Ec78Af
Farm risks and hazards are briefly summarized.

42. VICKREY, W. Measuring marginal utility by reactions to risk. Econometrica 13: 319-333. Oct. 1945. 280.8 Ec78

The Risk Problem in Agriculture

43. BARBER, E. L., and HORTON, D. C. Measuring and interpreting farm production risks. Agr. Finance Rev. 11: 28-38. Nov. 1948. 1.9 Ec78Af

44. BARBER, E. L. Modifying the Federal income tax to promote greater stability of farm income. J. Farm Econ. 30: 331-339. May 1948. 280.8 J822

45. BARBER, E. L. Production risks of the individual farmer, with particular reference to weather risks. Agr. Finance Rev. 10: 47-54. Nov. 1947. 1.9 Ec78Af
Discusses types of risks and their economic significance, and relation of weather risks to land values, especially in the Great Plains.

46. BOUCHER, G. P. Risk and uncertainty in agricultural entrepreneurship. Econ. Annalist 18: 85-88. Nov. 1948. 281.8 Ec72

47. BROWNLEE, O. H. Some consideration on forward prices. J. Farm Econ. 25: 495-504. May 1943. 280.8 J822
Discusses the possible results of shifting the uncertainty of price changes from the firm to a central agency; for example, from the farm to the Government.

The Risk Problem in Agriculture--Continued.

48. HEISIG, C. P. Income stability in high-risk farming areas. J. Farm Econ. 28: 961-972. Nov. 1946. 280.8 J822
The effect of wheat yield variations, with stable price and cost rates, on the income of a typical wheat farm in the Great Plains is illustrated by data from Sheridan County, Mont. The effect of reserves and crop insurance in stabilizing income is illustrated.

49. JOHNSON, D. G. Forward prices for agriculture. Chicago, U. Chicago Press, 1947. 259 p. Ref. 284.3 J63
Partial contents: Ch. 4, Uncertainty and resource use; Ch. 5, Farm size, risk aversion, and capital rationing.

50. RUDD, R. W., and MACFARLANE, D. L. The scale of operations in agriculture. J. Farm Econ. 24: 420-433. May 1942. 280.8 J822
The thesis is developed that, in agriculture, risk increases with scale of enterprise and is a major factor in determining size.

51. SCHULTZ, T. W. Agriculture in an unstable economy. New York, McGraw-Hill, 1945. 299 p. (Com. for Econ. Development. Res. Study) 281.12 Sch82A
Includes discussion of policies to lessen the instability of farm income, including crop insurance for areas of high climatic risk.

52. SCHULTZ, T. W. Capital rationing, uncertainty and farm-tenancy reform. J. Polit. Econ. 48: 309-324. June 1940. 280.8 J82
"Taking the family farm as an ideal, an end which society desires, we have sketched the economic effects of capital rationing and uncertainty upon two classes of farmers: (a) those who supplement their limited assets by borrowing funds and (b) those who do so by renting the resources. Within the framework of present institutions and practices, farmers who hire funds from outside sources in order to establish a firm are more likely to obtain sufficient capital to do this by renting than by borrowing. Furthermore, ownership of a farm results in the farm family bearing a much larger share of the economic uncertainty that lies ahead than it does when the farm real estate is being rented" (p. 323).

53. SCHULTZ, T. W. Redirecting farm policy. New York, Macmillan, 1943. 75 p. 281.12 Sch82
Includes a brief discussion of the importance of capital rationing in agriculture.

54. SCHULTZ, T. W. Theory of the firm and farm management research. J. Farm Econ. 21: 570-586. Aug. 1939. 280.8 J822
"It is in the imperfections of expectations that we come into contact with the more important real production problems and also the more difficult analytical problems of economics. This paper has been in a sense preliminary to an examination of the nature of expectations" (p. 586).
Discussion by H. C. M. Case, S. W. Warren, G. W. Forster, D. C. Mumford, and R. S. Kifer, J. Farm Econ. 22: 111-137. Feb. 1940.

55. SCHULTZ, T. W., and BROWNLEE, O. H. Two trials to determine expectation models applicable to agriculture. Q. J. Econ. 56: 487-496. May 1942. 280.8 Q2
Based on corn-yield and hog-price expectations of Iowa farmers.

56. SOCIAL SCIENCE RESEARCH COUNCIL. ADVISORY COMMITTEE ON SOCIAL AND ECONOMIC RESEARCH IN AGRICULTURE. Research in agricultural insurance: scope and method. Social Sci. Res. Council 14, 63 p. Oct. 1932. 281.29 So1
Includes detailed methodology for the following research projects: 1, Risks connected with farming, by S. E. Johnson; 2, Risks of agricultural marketing enterprises, by V. N. Valgren; 3, Personal risks of farm people.

57. U. S. BUR. OF AGRICULTURAL ECONOMICS. Adaptation of the farm capital structure to uncertainty, by D. C. Horton. Washington, 1948. 13 p. 1.941 F2Ad1
"For informal discussion in a seminar...University of Chicago, June 3 and 4, 1948."
Presents two illustrative cases: 1, Apparent adaptation of capital structure to uncertainty arising from variation in yields, based on data from 15 Wheat Belt counties; and 2, Apparent adaptation of capital structure to uncertainty associated with the crucial importance of management in financial success.

SPECIFIC AGRICULTURAL RISKS

Crop Production Risks

Yield Variability

58. ABBOTT, E. V. Some observations on weather and diseases in relation to the sugarcane yield curve in Louisiana since 1935. Sugar B. 26: 305-310. Ref. June 15, 1948. 65.9 Am32

Fig. 1, Tons of cane per acre, and accumulated rainfall and temperature departures for the months of January through March at four stations in Louisiana for the years 1935-47. Relation of weather to diseases affecting sugarcane is discussed.

59. AMERICAN NATIONAL LIVESTOCK ASSOCIATION. If and when it rains; the stockman's view of the range question. Denver, Colo. 1938. 60 p. 60.1 Am3

Charts give range condition, mean temperature, and average precipitation 1932-36, for each of the Range States.

60. BELL, M. A. The effect of tillage method, crop sequence, and date of seeding upon the yield and quality of cereals and other crops grown under dry-land conditions in north-central Montana. Mont. Agr. Expt. Sta. B. 336, 123 p. Ref. Feb. 1937. 100 M76B

Investigations at Northern Montana Branch Station, 1917-35. Discusses variation of crop yields because of seasonal conditions, tillage methods, previous crop, date of seeding, weeds, and soil moisture.

61. BOGUE, A. H. Estimating the yield of grain from the weather. Monthly Weather Rev. 62: 334-337. Sept. 1934. 1 W37M

Table compares yield of spring wheat in Saskatchewan with rainfall of the growing period (April to July) for 1904-30.

62. BOLLINGER, C. J. The cycle pattern of wheat yields in the Great Plains. Tex. Geog. Mag. 11(1): 19-25. Ref. Spring 1947. 331.8 T31

This analysis of precipitation and wheat yield data for the Southern Great Plains suggests a 22-year cycle of precipitation of solar origin and also a 22-year cycle of wheat yields, 9 years below normal and 13 years above, with variations.

63. BOSWELL, R. Citrus included in trial insurance. Citrus 7(1): 6-8, 14. July 1944. 80 C498

Includes R. R. Botts' plan for measuring the risk involved for any particular grove by comparing the actual yield during a period of years with the "normal" or average yields for trees of the same age. A table gives "normal" yields of oranges, grapefruit and tangerines for trees of 5-year age groups from 5 years to 50 years. Another table applies the plan to seasons from 1932/33 to 1937/38.

64. BOTTS, R. R. Development of "normal" citrus fruit yields by tree ages for use in a yield insurance plan. J. Farm Econ. 23: 867-872. Nov. 1941. 280.8 J822

Basis for measuring risks.

65. BOTTS, R. R. Some problems in connection with crop insurance for citrus fruits. Agr. Finance Rev. 3(1): 11-17. May 1940. 1.9 Ec78A

Low temperature is considered the most important hazard. Others are drought, wind, and insects. Tables give yields per 100 trees in 13 orange groves, 1929/30-1938/39; Age of trees, actual, normal and expected yields, and annual loss cost for one grove; and approximate coverage and loss costs for 24 orange groves in Florida and California.

66. BRENNEN, C. A. Receipts and costs on Nevada range cattle ranches for the years 1928, 1929 and 1930. Nev. Agr. Expt. Sta. B. 126, 25 p. Mar. 1932. 100 N41S

Includes discussion of the relation of precipitation to the quantity and price of feeds purchased by ranchers and consequently to the cost of raising cattle.

67. CHILCOTT, E. C. The relations between crop yields and precipitation in the Great Plains area. U. S. D. A. Misc. C. 81(sup. 1), 163 p. Oct. 1931. 1 Ag86Cm

Analyzes statistical data collected on 23 farms, 1918-26. Supplements analyses published in 1927.

68. CLAWSON, M., SAUNDERSON, M. H., and JOHNSON, N. W., Farm adjustments in Montana. Study of area IV: its past, present, and future. Mont. Agr. Expt. Sta. B. 377, 66 p. Ref. Jan. 1940. 100 M76

Causes of variability of wheat yields are given as low and variable precipitation, grasshoppers, rust, hail, and frost. Variations exist between localities and from farm to farm, as well as from year to year.

69. CLAWSON, M. Range and livestock condition in relation to annual precipitation. Amer. Cattle Prod. 25(8): 12, 14, 16, 18-19. Jan. 1944. 49 P94

Based on an analysis of range condition reports to the U. S. Bur. of Agricultural Economics by livestock producers, 1923-41. Includes formulas for estimating range condition from precipitation data in each of the 17 States included in the study.

Yield Variability--Continued.

70. CLAWSON, M. Range forage conditions in relation to annual precipitation. Land Econ. 24: 264-280. Ref. Aug. 1948. 282.8 J82

Presents a method of forecasting forage production in the central and northern Great Plains. Suggests adaptation of cattle marketing to precipitation. "For instance, if some year has been average or drier, only unusually favorable moisture the following year will produce above-average range. If cattle numbers are unusually high, there is a serious gamble involved in failing to reduce them to at least average levels" (p. 279).

71. CLENDENIN, J. C. Federal crop insurance in operation. Stanford U. Food Res. Inst. Wheat Studies 18: 229-290. Mar. 1942. 59.8 F73

Causes of wheat losses in certain areas are given in percentages. The most important is drought, followed by winterkilling, frost, cold and freezing; insects; plant diseases; hail; and heat.

72. CLENDENIN, J. C. Is Federal crop insurance worth its cost? West. Farm Econ. Assoc. Proc. 15: 95-104. 1942. 280.83 W53

Table I.-Frequency of good, average, and poor wheat yields in sample counties (62 farms for 9 years in each county). The evidence indicates that yields below 75 percent of a normal crop occur on almost one-third of our wheat farms each year. About one-third of these shortages are very small and fully 40 percent occur in isolated years, preceded and followed by satisfactory crops.

73. COLE, J. S. Correlations between annual precipitation and the yield of spring wheat in the Great Plains. U. S. D. A. Tech. B. 636, 39 p. Dec. 1938. 1 Ag84Te

Data obtained since 1906 by the Division of Dry Land Agriculture, Bureau of Plant Industry, are presented.

74. COLE, J. S., and MATHEWS, O. R. Relation of the depth to which the soil is wet at seeding time to the yield of spring wheat on the Great Plains. U. S. D. A. C. 563, 19 p. Ref. May 1940. 1 Ag84C

"Under the limited precipitation of the Great Plains, the initial water content of the soil, which can be approximated by the depth to which the soil is wet, is a strong determinant of the yield that will be produced" (p. 13). Seeding on soils wet only 1 ft. deep is not warranted, on soils wet 2 ft. deep results are more favorable, and good yields are assured on soils wet 3 ft. deep or more.

75. CRADDOCK, G. W., and FORSLING, C. L. The influence of climate and grazing on spring-fall sheep range in southern Idaho. U. S. D. A. Tech. B. 600, 42 p. Feb. 1938. 1 Ag84Te

"The influence of climate and grazing on (1) the periods of range use, (2) forage production, and (3) the condition and yields of range sheep was investigated at the United States Sheep Experiment Station near Dubois, Idaho, during the period 1924-32." The results of these studies are summarized.

76. ENGENE, S. A. Variability of crop yields in Minnesota. Minn. U. Divs. Agr. Econ. and Agr. Ext. Farm Business Notes 184: 1-3. Apr. 20, 1938. 275.29 M663

Coefficient of variation of yield for each county is given.

77. FRANKLIN, H. J., and STEVENS, N. E. Weather and water as factors in cranberry production. Mass. Agr. Expt. Sta. B. 433, 51 p. June 1946. 100 M38H

Supplement to B. 402 (item 78).

Tables and charts correlate sunshine, temperature and rainfall with production, 1880-1940.

78. FRANKLIN, H. J., BERGMAN, H. F., and STEVENS, N. E. Weather in cranberry culture. Mass. Agr. Expt. Sta. B. 402, 91 p. Apr. 1943. 100 M38H

The chapter entitled Cranberry Ice, by H. J. Franklin, gives history of losses from hail, winterkilling, and frosts in Massachusetts, New Jersey, and Wisconsin.

79. GILLETTE, J. M. North Dakota weather and the rural economy. N. Dak. U. Dept. Sociol. and Anthrop. B. 11, 98 p. 1945. 281.065 G41

Reprinted from North Dakota History 12(1-2), Jan.-Apr. 1945.

Discusses the relation of temperature and precipitation to wheat yields and the impossibility of predicting the weather.

80. HALLSTED, A. L. Reducing the risk in wheat farming in western Kansas. Kans. State Bd. Agr. Biennial Rpt. (1935-1936) 30: 98-111. 2 K13R

Yield Variability--Continued.

Reports results of experiments at the Fort Hays Branch Experiment Station, 1910-35, on the relation between soil moisture and yields of wheat. Wheat sown on 28 plots having less than 1.5 inches of available moisture in the soil produced 21 yields of less than 10 bushels and only one yield of as much as 20 bushels; 36 plots having 1.5-2.9 inches of available moisture produced 15 yields of less than 10 bushels and 3 yields of 30 bushels or more; 34 plots having 3 or more inches of available moisture produced no yield of less than 10 bushels and 5 yields of 40 bushels or more. Wheat seeded in dry soil on 14 plots resulted in 9 yields of less than 5 bushels and no yield of as much as 20 bushels; 24 plots of soil wet 1 foot deep resulted in 13 yields of less than 10 bushels and 3 yields of 20-25 bushels; 29 plots of soil wet 2 feet deep resulted in 11 yields of less than 10 bushels and 3 yields of 30 bushels or more; 30 plots wet 3 or more feet deep resulted in only 1 yield of less than 10 bushels and 5 yields of 40 or more.

81. HALLSTED, A. L., and MATHEWS, O. R. Soil moisture and winter wheat with suggestions on abandonment. Kans. Agr. Expt. Sta. B. 273, 46 p. Jan. 1936. 100 K13S

The effect of the quantity of moisture in the soil at seeding time on the yield of wheat is analyzed from experiments conducted at Fort Hays, Colby, and Garden City, Kans. At Colby: "There were 20 cases when the quantity of available water in the soil at seeding time was 3 inches or more, 16 of these being on the fallowed plot. This shows how seldom any method of cultivation other than fallow is capable of storing that much water. Of the 20 cases, there were five with yields less than 10 bushels per acre, one of these being a total failure, six with yields of from 10-19 bushels, four with yields of 20 to 29 bushels, and five with yields of more than 30 bushels per acre, the maximum being 43 bushels. ...The total failure in this group indicates that conditions following seeding may be severe enough to cause failure, even with as much as 6 inches of water in the soil at seeding time" (p. 29).

82. HAMPSON, C. M., and CHRISTOPHERSEN, P. An economic study of farms in the spring wheat area of South Dakota. S. Dak. Agr. Expt. Sta. C. 19, 19 p. May 1934. 100 So82

Crop indexes for the years 1930-33 were 83, 40, 108, and 15 respectively, as compared with an average crop index of 100 for a long period. The low index of 1931 was due to grasshoppers and drought, that of 1933 to extreme and wide-spread drought. Livestock production of 1933 was curtailed because drought caused a great shortage of feed.

83. HOYT, J. C. The drought of 1930. Amer. Water Works Assoc. J. 23: 1822-1864. Nov. 1931. 292.9 N44

Vegetation, p. 1838-1844. Crop yields by States in 1930 are expressed as percentages of average yields and are related to precipitation.

84. IOWA. STATE COLLEGE OF AGRICULTURE AND MECHANIC ARTS. EXTENSION SERVICE. 1934 farm business record report. Iowa State Col. Ext. Serv. FM-193, 30 p. 1935. 275.29 Io9F

Compares returns and yields in the drought area (40 counties in the southern and southwestern part of the State) with those in non-drought areas.

Similar reports for earlier years show effects of drought on returns.

85. KIFER, R. S. Farm relief and rehabilitation problems in the loess hills of central Nebraska (as typified by Sherman County, Nebraska). U. S. Works Prog. Admin. Res. B. K-1, 36 p. Mar. 1936. 173.2 W89Rek

Table 3 gives proportion of years damage was reported from drought, hail, soil blowing, rust, frost, flood, grasshoppers, and other insects, together with degree of loss. Variations in crop yields and the drought of 1934 are discussed (p. 6-7).

86. KLAGES, K. H. Geographical distribution of variability in the yields of field crops in the States of the Mississippi Valley. Ecology 11: 293-306. Ref. Apr. 1930. 410 Ec7

"A low variation in the yields of a crop over a period of years serves as a measure of stability of production in so far as the returns from a given acreage can be ascertained in advance with a reasonable degree of certainty. An excessively high degree of variability in the yields of one or more crops in a given area indicates that certain hazards, most likely climatic, are encountered in the production of that particular crop or series of crops" (p. 293). Tables show average yields, range in yields, degree of variability of yields and trends in yields of corn, oats, wheat, barley, and rye by States. Degrees of correlation between the yields of the separate crops are also shown.

Yield Variability--Continued.

87. KLING, W. Determination of relative risks involved in growing truck crops. J. Farm Econ. 24: 694-698. Aug. 1942. 280.8 J822

The degree of variability of fifteen fresh market truck crops was measured by subtracting annual crop prices, yields and value per acre, 1918-40, from the preceding year's price, yield and value per acre and expressing the standard deviation of these changes or first differences as a percentage of the average (arithmetic mean) price, yield or value per acre. The degree of variability of value per acre indicates the risk involved in growing the crop.

88. LANTOW, J. L., and FLORY, E. L. Fluctuating forage production; its significance in proper range and livestock management on southwestern ranges. Soil Conserv. 6: 137-144. Ref. Dec. 1940. 1.6 So3S

Chart compares deviations of forage production and of precipitation from the average, 1924-35.

Importance of timely adjustments in livestock numbers because of variations in available forage is discussed.

89. MACY, L. K., ARNOLD, L. E., and MCKIBBEN, E. G. Changes in technology and labor requirements in crop production: corn. U. S. Works Prog. Admin. Natl. Res. Proj. Rpt. A-5, 181 p. Ref. June 1938. 173.2 W89St

Includes discussion of trends in acreage, production, and yields of corn and of causes of fluctuations. Statistics cover varying periods during 1909-36 for the major farming areas of the United States.

90. MACY, L. K., and others. Changes in technology and labor requirements in crop production: sugar beets. U. S. Works Prog. Admin. Natl. Res. Project Rpt. A-1, 48 p. Ref. Aug. 1937. 173.2 W89St

L. E. Arnold, E. G. McKibben, and E. J. Stone, joint authors.

Fig. 4 shows yields for 1924-36 in California, Colorado and Idaho. Causes of fluctuations in yields, particularly diseases, are discussed.

91. MALIN, J. C. Winter wheat in the golden belt of Kansas; a study in adaption [sic] to subhumid geographical environment. Lawrence, Kans., U. Kans. Press, 1944. 290 p. Ref. p. 257-284. 30.9 M292

Winter wheat hazards, p. 16. Acreage abandoned because of winter-kill, in four counties, 1879-1884, p. 264. For discussion of winter-kill in the crop records, consult references in the index.

92. MATHEWS, O. R., and BROWN, L. A. Winter wheat and sorghum production in the southern Great Plains under limited rainfall. U. S. D. A. C. 477, 59 p. Ref. July 1938 1 Ag84C

Frequency of wheat crop failure is estimated by precipitation level for the southern Great Plains.

93. PASCHAL, J. L., NELSON, A. G., and ROGENESS, O. Planning minimum sized farms for the Beadle County area in central South Dakota. S. Dak. Agr. Expt. Sta. B. 341, 63 p. Jan. 1940. 100 So82

Precipitation and Crop Production, p. 19-21. Discusses the relation between precipitation and grain production, 1889-1938.

94. PENGRA, R. F. Correlation analysis of precipitation and crop yield data for the sub-humid areas of the northern Great Plains. Amer. Soc. Agron. J. 38: 848-850. Sept. 1946. 4 Am34P

Based on data for eight counties in three areas, 1919-43, and yields of corn, wheat, oats, and barley.

95. PENGRA, R. F. Crop production in the semi-arid regions an insurable risk. J. Farm Econ. 29: 567-570. May 1947. 280.8 J822

Based on a study of precipitation and wheat yields in central South Dakota for 1919-43.

96. PEVEHOUSE, H. M. Conditions in the southwestern wheat area which affect the rehabilitation program (as typified by Perkins County, Nebraska). U. S. Works Prog. Admin. Res. B. K-3, 39 p. May 1936. 173.2 W89Rek

Table 5 gives proportion of years damage was reported from drought, hail, soil blowing, rust, frost, flood, grasshoppers, and other insects, together with degree of loss, by type of soil.

97. PEVEHOUSE, H. M. Natural and economic factors affecting rehabilitation in the upper south plains of the Texas Panhandle and the high plains of eastern New Mexico (as typified by Curry County, New Mexico). U. S. Works Prog. Admin. Res. B. K-10, 49 p. Dec. 1936. 173.2 W89Rek

Discusses variations in crop yields (p. 8-9). Table 3 gives percent of years damage was reported from drought, hail, insects, soil blowing, frost, flood, and rust, in the row-crop and the grain section, together with degree of loss.

Yield Variability--Continued.

98. PEVEHOUSE, H. M. Natural and economic factors affecting rural rehabilitation on the south plains of the Texas Panhandle (as typified by Hale County, Texas). U. S. Works Prog. Admin. Res. B. K-12, 38 p. Jan. 1937. 173.2 W89Rek

Discusses variations in crop yields (p. 7). Table 3 gives proportion of years damage was reported from drought, hail, insects, frost, soil blowing, flood, and rust, together with degree of loss.

99. PEVEHOUSE, H. M. Natural and economic factors which affect rural rehabilitation in the high plains area of eastern Colorado (as typified by Cheyenne County, Colorado). U. S. Works Prog. Admin. Res. B. K-6, 38 p. July 1936. 173.2 W89Rek

Discusses variations in crop yields (p. 6-7). Table 5 gives proportion of years damage was reported from drought, hail, rust, flood, soil blowing, frost, grasshoppers, and other insects, together with degree of loss.

100. PEVEHOUSE, H. M. Natural and economic factors which affect rural rehabilitation on the north plains of Texas (as typified by Dallam County, Texas). U. S. Works Prog. Admin. Res. B. K-5, 44 p. July 1936. 173.2 W89Rek

Discusses variations in crop yields (p. 6-7). Table 3 gives proportion of years damage was reported from drought, soil blowing, excess moisture, hail, insects, smut and rust, and frost on 37 farms in the grain section and 43 farms in the row-crop section, together with the extent of damage.

101. RASKOPF, B. D., and FICKEL, E. B. Cotton crop insurance in Tennessee and United States. Tenn. Agr. Expt. Sta. Rural Res. Ser. Monog. 198, 29 p. Ref. May 8, 1946. 173.2 W89Co

Table 3 gives percentage of indemnified losses caused by various hazards, by States, 1942. Table 5 shows trends in cotton yields by counties in Tennessee, 1932-43.

102. RASKOPF, B. D. Tobacco crop insurance in Tennessee. Tenn. Agr. Expt. Sta. Rural Res. Ser. Monog. 202, 29 p. Ref. June 15, 1946. 173.2 W89Co

Table gives estimated percentage reduction from full yield per acre for the United States for each year, 1909-25, from plant diseases, insect pests, and specified climatic conditions. Average reduction for the 11 years, 1916-25, was 21 percent, ranging from 14.2 percent in 1918 to 28.5 percent in 1925. Insurance loss experience is also discussed.

103. RASKOPF, B. D., and FICKEL, E. B. Wheat crop insurance in Tennessee and United States. Tenn. Agr. Expt. Sta. Rural Res. Ser. Monog. 197, 36 p. Ref. Apr. 20, 1946. 173.2 W89Co

Table 5 gives percentage of indemnified loss, by hazards, in Tennessee and the United States, 1940-42. Table 8 gives loss experience on 320 east Tennessee wheat farms, 1935-41.

104. RHODES, N. Weather damage to Florida crops. For Sale, Want and Exch. B. 2(5): 1, 4. June 1, 1944. 280.38 F74

Reports percentage of loss of bean, pepper, and tomato crops from weather damage for each season, 1926/27-1942/43.

105. RHODES, N. What price the weather. For Sale, Want and Exch. B. 9(1): 1. Oct. 15, 1947. 280.38 F74

The effect of the weather on Florida vegetable crops is summarized for each season, 1925/26-1946/47.

106. ROBB, A. D. The critical period of corn in northeastern Kansas. Monthly Weather Rev. 62: 286-289. Aug. 1934. 1 W37M

Tables give correlation coefficients of rainfall and corn yields at various periods, based on data for 1901-33. The critical period is the tasseling period which occurs about July 14 in northeastern Kansas. Rainfall of 2-1/2 inches or more near that period practically insures a crop of 25 bushels per acre.

107. ROGLER, G. A., and HAAS, H. J. Range production as related to soil moisture and precipitation on the northern Great Plains. Amer. Soc. Agron. J. 39: 378-389. Ref. May 1947. 4 Am34P

A high correlation is shown.

108. SCHILLETTER, J. C., ELWOOD, R. B., and KNOWLTON, H. E. Changes in technology and labor requirements in crop production: vegetables. U. S. Work Proj. Admin. Natl. Res. Proj. Rpt. A-12, 131 p. Ref. Sept. 1939. 173.2 W89St

Discusses acreage, production and yields of sweetpotatoes, tomatoes, lettuce, muskmelons, onions, and cabbage, and mentions causes of fluctuations in yields.

Yield Variability--Continued.

109. SCOVILLE, O. J., and GIBSON, J. W. The Great Plains and the supply of wheat. U. S. Bur. Agr. Econ. Farm Mangt. Rpt. 23, 27 p. Ref. May 1941. 1.941 L6F22

Table 1.- Frequency of occurrence of wheat fields which were good, medium, poor, and failures in various counties in the Great Plains. Table 2.-Relative importance of various types of damage to wheat. Types of damage are drought, insects, hail, soil blowing, smut and rust, frost and excess precipitation.

110. SMITH, M. G., and ROBERTSON, L. An economic analysis of the production of peppermint and spearmint oils in Indiana. Ind. Agr. Expt. Sta. B. 459, 31 p. Mar. 1941. 100 In2P

Effects of diseases, insects, frost, and wind on yields of peppermint and on profits are given.

111. STEWART, H. L. The agricultural situation in the intensive livestock production area of southeastern South Dakota (as typified by Moody County, South Dakota). U. S. Works Prog. Admin. Res. B. K-11, 37 p. Dec. 1936. 173.2 W89Rek

Variations in crop yields are discussed (p. 8). Table 5 gives percent of years damage was reported from drought, hail, frost, grasshoppers, rust, soil blowing, and flood, together with degree of damage.

112. STEWART, H. L. Natural and economic factors affecting rural rehabilitation in central North Dakota (as typified by Sheridan County, North Dakota). U. S. Works Prog. Admin. Res. B. K-8, 38 p. Aug. 1936. 173.2 W89Rek

Discusses variations in crop yields (p. 6-7). Table 5 gives percentage of years damage was reported from drought, grasshoppers, hail, rust, soil blowing, and frost, together with degree of loss.

113. STEWART, H. L. Natural and economic factors affecting rural rehabilitation in southeastern Wyoming (as typified by Goshen County). U. S. Works Prog. Admin. Res. B. K 13, 45 p. Mar. 1937. 173.2 W89Rek

Discusses variations in crop yields (p. 7-8). Table 4 gives proportion of years damage was reported from drought, hail, soil blowing, frost, plant disease, excessive moisture, and insects, on 29 irrigated farms and 43 non-irrigated farms, together with degree of loss.

114. STEWART, H. L. Natural and economic factors affecting rural rehabilitation problems in central South Dakota (as typified by Hyde County, South Dakota). U. S. Works Prog. Admin. Res. B. K-2, 41 p. Mar. 1936. 173.2 W89Rek

Table 5 gives the following causes of crop damage in order of importance: Drought, grasshopper, hail, soil blowing, rust, frost, other insects. Discussion of causes (p. 8-9).

115. STEWART, H. L. Natural and economic factors affecting rural rehabilitation problems in northwestern North Dakota and northeastern Montana (as typified by Divide County, North Dakota). U. S. Works Prog. Admin. Res. B. K-7, 42 p. Aug. 1936. 173.2 W89Rek

Discusses variations in crop yields (p. 6-7). Table 4 gives proportion of years damage was reported from drought, hail, grasshoppers, soil blowing, rust, frost, flood, and other insects, together with degree of loss.

116. STEWART, H. L. Natural and economic factors affecting rural rehabilitation problems in southwestern North Dakota (as typified by Hettinger County). U. S. Works Prog. Admin. Res. B. K-4, 39 p. May 1936. 173.2 W89Rek

Table 3 gives proportion of years damage was reported from drought, grasshoppers, hail, rust, soil blowing, frost, flood, and other insects, together with degree of loss.

117. STEWART, H. L. Natural and economic factors affecting the possibility of closer settlement in the Red River Valley of eastern North Dakota (as typified by Traill County, North Dakota). U. S. Works Prog. Admin. Res. B. K-9, 30 p. Sept. 1936. 173.2 W89Rek

Discusses variations in crop yields (p. 6). Table 5 gives proportion of years damage was reported from drought, grasshoppers, smut and rust, hail, soil blowing, and frost, together with degree of loss.

118. STRASZHEIM, R. E. Corn and hay yields for 1930. Ohio Agr. Expt. Sta. Bimonthly B. 150: 113-115. May 1931. 100 Oh3S

Precipitation for this drought year is compared to normal and yields of corn, wheat, oats, hay and potatoes are compared to average.

119. SWIFT, E. L., and CLELAND, F. A. The effect of climate on sugar beet yields in western Montana.

Yield Variability--Continued.

Amer. Soc. Sugar Beet Technol. Proc. (1946) 4: 135-140. Ref. 1947. 66.9 Am35

Each degree of annual variation in the average of October-September daily mean temperatures produces approximately one ton difference in sugar beet yields. Annual rainfall is also associated with yield but not to the same extent as mean temperature.

120. TIMOSHENKO, V. P. Variability in wheat yields and outputs. Stanford U. Food Res. Inst. Wheat Studies 18: 291-338. Apr. 1942. 59.8 F73

"Periodic fluctuations in weather conditions, if they exist, account for only a small portion of the total variability of crops; and factors other than weather elements, such as soils, plant diseases, insect pests, and many other biological factors connected with the growth of plants, are of importance. The influences of weather elements on yields depend not only on variations in any one of these elements separately, but also on their coincidence in time among themselves as well as with certain stages in the growth of plant. Under such circumstances, much more place is left for chance than for regularity in fluctuations in yields" (p. 297).

121. U. S. BUR. OF AGRICULTURAL ECONOMICS. Analysis of variations in rice yields in Arkansas, Louisiana, and Texas, by R. R. Botts. Washington, 1946. 12 p. 1.941 S2R36

Records of yield from 1272 rice farms in these States are analyzed statistically. Results indicate that yields do not vary greatly on rice farms. They may be reduced on individual farms by insects, plant diseases, windstorm, or salt-water damage.

122. U. S. BUR. OF AGRICULTURAL ECONOMICS. Cotton: factors accounting for reduction from full yield, United States, 1909-41. U. S. Bur. Agr. Econ. Cotton Situation 69: 1. July 1942. 1.9 Ec752F

Chart. Causes of reduction are boll weevil, deficient moisture, excessive moisture, other climatic, other insect, and all other.

123. U. S. BUR. OF AGRICULTURAL ECONOMICS. Economic use and administration of a fluctuating forage supply; preliminary memorandum describing a current research project. By M. Clawson and H. Hochmuth. Berkeley, Calif., 1941. 26 p. 1.941 H2F74

Discusses relation between precipitation and forage production.

124. U. S. BUR. OF AGRICULTURAL ECONOMICS. Economic use and administration of a fluctuating forage supply; second preliminary memorandum describing a current research project. By M. Clawson. Berkeley, Calif., 1943. 26 p. 1.941 H2F74

Relation of precipitation to forage supply.

125. U. S. DEPT. OF AGRICULTURE. Agricultural statistics, 1947. Washington, 1948. 688 p. 1 Ag84Yas

Issued annually.

Table 91, Cotton: percentage reduction from full yield per acre from stated causes, by States, 1945 and 1946; Table 540 includes death loss of chickens by States, 1945; Table 560 includes death loss of turkeys by States, 1945.

126. U. S. DEPT. OF AGRICULTURE. Soils & men. Yearbook of agriculture 1938. Washington, 1938. 1232 p. 1 Ag84Y

Partial contents: The problem: subhumid areas, by J. B. Bennett, F. R. Kenney, and W. R. Chapline (risks from variations in rainfall in the Great Plains), p. 68-76; The causes: price relations and economic instability, by L. H. Bean, J. P. Cavin, and G. C. Means (includes instability in acreage and yields), p. 171-197; Special dry-farming problems, by O. R. Mathews and J. S. Cole, p. 679-692.

127. U. S. DEPT. OF AGRICULTURE. Yearbook of agriculture, 1937. Washington, 1937. 1497 p. 1 Ag84Y

Effect of the drought of 1936 on crop production is discussed, p. 32-44. Drought and heat combined reduced canning crop yields about 10 percent below those of the preceding year (p. 56). Yield of potatoes was 97 bus. per acre compared with a 10-year average of 112.7 bus. The apple crop was the smallest since 1921 (p. 56). Annual loss from late blight of potatoes has averaged 9,000,000 bus. for the past 10 years (p. 406).

128. U. S. FEDERAL CROP INSURANCE CORPORATION. Report of the manager, 1943. Washington, 1943. 32 p. 1 Ag84

Table 5.-Indemnified losses, percentage caused by various hazards on insured wheat crops, 1940, 1941, and 1942, by wheat area and State.

Yield Variability--Continued.

129. U. S. FEDERAL CROP INSURANCE CORPORATION. Report of the manager, 1944. Washington, 1944. 22 p. 1 C88R

Table 1 gives percentage of indemnified losses on insured 1942 cotton crops caused by various hazards. Losses in 1943 to both wheat and cotton were caused by the Mississippi River flood. The other major losses to wheat in 1943 were caused by winterkill and greenbugs.

130. U. S. FEDERAL CROP INSURANCE CORPORATION. Report of the manager, 1946. Washington, 1946. 37 p. 1 C88R

Tables give loss ratios and primary causes of loss for wheat, flax, corn, and tobacco, by States.

131. U. S. FEDERAL CROP INSURANCE CORPORATION. Report of trial insurance on tobacco and corn, by G. F. Geissler. Washington, 1946. 7 p. 1.952 R29

Following are the causes of loss reported: On tobacco, excessive moisture and flood, 44 percent; frost 20 percent; drought, 6 percent; windstorm, 5 percent; miscellaneous, 25 percent; on corn, excessive moisture, 72 percent; frost, 13 percent; miscellaneous, 15 percent.

132. U. S. GREAT PLAINS COMMITTEE. The future of the Great Plains. Washington, 1936. 194 p. 173.2 G79F

Mentions climate variability and crop yields. Charts show yields of corn and wheat by selected States, 1866-1935.

133. VISHER, S. S. Weather influences on crop yields. Econ. Geog. 16: 437-443. Oct. 1940. 278.8 Ec7

Describes a "climograph" or diagram for plotting temperature and rainfall, by means of which the relation between weather and yields of corn, wheat, oats, and hay are studied. "For wheat, Februaries which are drier than normal for Indiana are advantageous, as are warmer Marches, cooler Mays, and winters with about 25 inches of snowfall; for oats, relatively cool Mays are advantageous as are cooler and wetter Junes and Julys. For hay, relatively warm springs, wet Mays, and cool wet Junes are advantageous. For corn, May and June which are warmer than usual in Indiana are desirable as are a July and August which are less hot than usual; also, more rainfall than Indiana's average amount is desirable for corn, especially in July and August" (p. 443).

134. WARD, R. E. Adjusting wheat acreage in the Northern Great Plains to wartime demand. J. Land and Public Util. Econ. 20: 344-360. Nov. 1944. 282.8 J82

Natural Hazards to Wheat Production, p. 353-354. Includes discussion of a "risk factor" which was calculated for each county from data on county average yield of wheat and premium rates for "75 percent insurance" obtained from the Federal Crop Insurance Corporation. The factor varied from 5 to 35 percent.

135. WHEAT CROP INSURANCE CONSULTING COMMITTEE. [Report of an examination, study and analysis of the activities of the Federal Crop Insurance Corporation in wheat insurance]. Chicago, 1942. 425 p. 284.6 W56R

The percentage of acreages damaged by specified causes in the United States, Great Plains, spring wheat area, Middle East, Far West, and East is given for 1940 (p. 274).

136. WILLIAMSON, P. S. Economic aspects of sugarcane production in Louisiana, 1941. La. Agr. Expt. Sta. Mimeog. C. 26, 94 p. June 1942. 100 L935

Quotes E. V. Abbott's statement that chlorotic streak reduced the yield of variety C. P. 28/19 by 9 percent, and of variety C. P. 29/320 by 26 percent. Quotes A. L. Dugas' statement that cane borers reduced the yield of cane per acre by an average of 64 percent and the sucrose content per ton of cane by 83 percent. Figure 8 shows the relation between rainfall in January, February and March and the yield of sugarcane the following fall, 1906-41. The effect of wind damage on weight of cane and on sugar per ton of cane, as reported by G. Arceneaux, is given in Table 70 for three varieties of cane.

Plant Diseases

137. BUCHHOLTZ, W. F. Diseases of small grains, flax, and several vegetable crops in South Dakota in 1942. S. Dak. Acad. Sci. Proc. (1943) 23: 65-76. 1944. 500 So82

Table 1 gives estimated percentage of yield loss and total loss from specified diseases of wheat, barley, oats, rye, and flax.

Plant Diseases--Continued.

138. EDSON, H. A., and WOOD, J. I. Crop losses from plant diseases in the United States in 1939. Plant Dis. Rptr. Sup. 127: 177-209 Dec. 31, 1940. 1.9 P69P

Tables give estimates of percentage reduction in yield of each specified crop caused by each specified disease, by States.

Issued annually beginning with 1932 (Sup. 83) which covered the years 1928-30. No later reports were issued.

139. FOX, D. C., CHAMBERLIN, J. C., and DOUGLASS, J. R. Factors affecting curly top damage to sugar beets in southern Idaho. U. S. D. A. Tech. B. 897, 29 p. Ref. Aug. 1945. 1 Ag84Te

Results of 8 years' studies (1930-37) of the factors which determine the source, magnitude, and time of dispersal of the beet leafhopper (Eutettix tenellus (Bak.)) which transmits the virus of curly top, and of the effect of curly top on sugar-beet yields. Tables give acreage planted, percentage abandoned, and yield per acre harvested.

140. JOHNSTON, C. O., MELCHERS, L. E., and MILLER, J. O. The wheat stem rust epidemic of 1937 in Kansas. Plant Dis. Rptr. Sup. 107: 83-94. Aug. 1, 1938. 1.9 P69P

Includes magnitude and types of losses, p. 89-91.

141. TEHON, L. R., and STOUT, G. L. Epidemic diseases of fruit trees in Illinois 1922-1928. Ill. Natl. Hist. Survey B. 18: 414-509. 1930. 410.9 Il6

Prevalence of five diseases of apples, four of peaches, one of pears, two of cherries and two of plums is indicated by index numbers developed from surveys made each year, 1922-1928.

Insects

142. ARNASON, A. P., and MCDONALD, H. Estimates of damage by the major field crop pests: 1946. Saskatchewan. Dept. Agr. Rpt. 42: 91-92. 1947. 7 Sa73

Similar reports are issued annually. Average percentage reduction in yield of all grain and feed crops by specified insects is shown, by districts, in a table.

143. BRITNELL, G. E. The wheat economy. Toronto, U. of Toronto Press, 1939. 259 p. (Political Econ. Ser. 4) 281.359 B772

Discussion of the general economic effects of drought in Saskatchewan in the 1930's. Table (p. 63) gives percentage reduction of grain yields from major insect pests in Saskatchewan, 1927-37.

144. CHAPMAN, R. N. Insect population problems in relation to insect outbreak. Ecol. Monog. 9: 261-269. Ref. July 1939. 410 Ec72

Summarizes the literature that reports studies of insect outbreaks and states the problems on which research is needed.

145. HOPE, E. C. Weather and crop history in western Canada. C. S. T. A. Rev. [Canada] 16: 347-358. Mar. 1938. 7 C167C

History is summarized for each year, 1813-1937, noting wet and dry years, condition of the crop, and grasshopper infestation.

146. HYSLOP, J. A. Losses occasioned by insects, mites, and ticks in the United States. U. S. Bur. Ent. & Plant Quar. E-444, 57 p. July 1938. 1.9 En83

Includes estimates of percentage reduction from a full yield of various crops by specified insects for specified States and years.

147. MINNEMAN, P. G., and HILL, E. B. Organization of farms in southeastern Michigan. Mich. Agr. Expt. Sta. Spec. B. 254, 51 p. Dec. 1934. 100 M58S

Based upon the records of 121 farms in 1930, 105 farms in 1931, and 63 in 1932. In 1931 78 percent of the farmers reported corn-borer damage to the corn crop. Damage was estimated to amount to an average of 6 percent reduction in yield, but amounted to as much as 33 percent on some farms.

148. PATCH, L. H., and others. Factors determining the reduction in yield of field corn by the European corn borer. J. Agr. Res. 65: 473-482. Nov. 15, 1942. 1 Ag84J

G. W. Still, M. Schlosberg, and G. T. Bottger, joint authors.

Discusses relation between yield of corn and borer population, and effects of weather, soil fertility, type of soil, stage of plant development, and strain of corn on yield.

149. SMITH, G. D. Weather and weevils, a new cycle of heavy damage years. Manchester Guardian (World Textiles Sup.) 1932: 9. Oct. 1, 1932. 304.9 M31W

Discusses the relation of weather conditions during the crop year to risk of weevil damage to the American cotton crop. Explains why the cyclical theory of weevil damage broke down in 1932

Insects--Continued.

150. U. S. CONGRESS. HOUSE. COMMITTEE ON APPROPRIATIONS. Department of agriculture appropriation bill, 1949. Hearings, 80th Cong., 2nd sess. Washington, 1948. 2 v. 1 Ag81Hes

Estimate of losses caused by certain insects injurious to agriculture, by U. S. Bur. of Entomology and Plant Quarantine (v. 2, p. 874-877). Table lists losses to specified crops for specified areas and periods, in dollars.

Weather: Drought, Rainfall and Wind

151. BAKER, O. E. Government research in aid of settlers and farmers in the northern Great Plains of the United States. Amer. Geog. Soc. Spec. P. 14: 61-79. Ref. 1932. 282.2 Am34

Mentions the problems created by the drought years 1916-23 and notes the Government programs developed to aid in solving them.

152. BARNETT, R. J., and AMSTEIN, W. G. What the droughts of the '30's did to apple orchards in the Arkansas River Valley in Kansas. Amer. Soc. Hort. Sci. Proc. (1939) 37: 116-118. 1940. 81 So12

These orchards were surveyed in 1929 and again in 1939, during which period annual rainfall was below average. Acreage in orchards had decreased from 3,051 to 791 acres, number of trees from 111,726 to 28,950. Rainfall in 1933, 1934, and 1936 averaged 19.39, 20.33 and 17.56 inches, respectively. The normal annual average rainfall for the period ending in 1930 was 33.5 inches.

153. BLUMENSTOCK, G., JR. Drought in the United States analyzed by means of the theory of probability. U. S. D. A. Tech. B. 819, 63 p. 1942. Ref. 1 Ag84Te

"This bulletin develops a statistical method for the description of occurrence of drought and shows how drought hazard can be expressed in terms of probability or chance" (p. 61).

154. BOLLINGER, C. J. The 22-year solar pattern of rainfall in Oklahoma and Kansas. Amer. Meteorological Soc. B. 26: 376-383. Ref. Nov. 1945. 340.8 Am32

"The climate of Oklahoma and Kansas during the period of reliable meteorological record, 1886-1944, has exhibited a 22-year cycle of solar pattern. The recurrent series of wet and dry, 'good' and 'poor' crop years are not, as thought by some meteorologists, purely fortuitous, nor terrestial, but mainly solar in origin, cyclic in character and hence roughly predictable" (p. 382).

155. BOWMAN, I. Jordan country. Geog. Rev. 21: 22-55. Jan. 1931. 500 Am35G

Hazards of the Great Plains dry-farming region as illustrated by this area in Montana.

156. BROWN, L. H. Drouth. Mich. State Col. Agr. Ext. Mich. Farm Econ. 46: 2-3. Oct. 1946. 275.29 M58A

Rainfall in Michigan for June through August 1946 was 84 percent of normal. Compared with the 1935-44 average, the hay crop was 13 percent smaller, the wheat and oats crops 32 and 74 percent larger, and barley 13 percent smaller. The corn crop was poor.

157. CALL, L. E. Cultural methods of controlling wind erosion. Amer. Soc. Agron. J. 28: 193-201. Mar. 1936. 4 Am34P

"In the future, soil erosion by wind may be expected to become a serious problem whenever climatic conditions re-occur similar to the conditions that prevailed in Thomas County, Kansas, from 1911 to 1915 and throughout the Central Great Plains from 1931 to 1935" (p. 197).

158. CALL, L. E. Safeguards against drouth: storing surplus feed. Kans. State Bd. Agr. Rpt. 56(221-A): 53-61. Mar. 1937.

Discusses definitions of drought, Kansas weather records, experiences in storing feed in good years for use during drought years, and farm management practices.

159. CHOUN, H. F. Duststorms in the southwestern Plains area. Monthly Weather Rev. 64: 195-199. June 1936. 1 W37M

Describes effects of the storms on the agriculture of the region. Table 1 gives date, visibility, and duration of duststorms at Amarillo, Tex., Jan. 1933-Mar. 1936.

160. CLAWSON, M. Sequence in variation of annual precipitation in the western United States. J. Land & Pub. Util. Econ. 23: 271-287. Aug. 1947. 282.8 J82

Development of a formula to assist in forecasting precipitation so that farming may be expanded and contracted with less risk.

Weather: Drought, Rainfall and Wind--Continued.

161. CLEMENTS, F. E., and CHANEY, R. W. Environment and life in the Great Plains. Carnegie Inst. Wash. Supplementary P. 24, 54 p. Aug. 15, 1936. 500 C21Sp

"Land classification, utilization, and conservation all rest squarely upon the basic principle of cycles, and no permanent and scientific system of production is possible without taking it into full account....No more dramatic test of the risk attending controlled production through curtailment could be asked than that afforded by the recent drought period throughout the West" (p. 45).

162. CONDRA, G. E. Drouth, its effects and measures of control in Nebraska. Nebr. U. Conserv. and Survey Div. Nebr. Conserv. B. 25, 43 p. Apr. 1944. 279.9 N272B

163. CROWE, P. R. The rainfall regime of the western plains. Geog. Rev. 26: 463-484. July 1936. 500 Am35G

The variability of monthly rainfall is indicated by "dispersion diagrams" for some 200 stations in the western Great Plains.

164. DALE, T. When drought returns to the Great Plains. U. S. D. A. Farmers' B. 1982, 14 p. Mar. 1947. 1 Ag84F

Describes methods of controlling wind erosion that proved successful during the long drought of the thirties. Droughts occur from time to time in the Great Plains and are not predictable.

165. DANIEL, H. A. Study of certain climatic factors that may affect crop yields in the high plains of Oklahoma. Okla. Agr. Expt. Sta. Panhandle B. 57: 3-10. Ref. June 1935. 100 Ok42

Study of seasonal evaporation, mean maximum, mean minimum and mean temperature, average annual wind velocity and total rainfall.

166. DUMM, L. D., and LIDDELL, W. J. Preliminary climatological study of relationship between amount of rainfall and drought occurrences in Georgia. Ga. Col. Agr. Ann. Rpt. 1945/46: 5-19. 1946. 276 G29An

Chart shows drought periods at Athens, Ga., 1920-44. Drought occurrences at other locations are given in tables.

167. EVANS, W. S., STATISTICAL SERVICE. Drought areas of the Prairie Provinces, 1929 to 1934. Extensive areas of the prairies have suffered crop failure because of drought in each of the last six years. A survey of the effects upon farm income, and possibilities for 1935. Winnipeg, 1935. 8 p. 281.13 Ev1

Tables give, for each drought district, total wheat production for each year 1929-34 and possible increases for 1935 in bushels and in value at 60¢ per bushel over 1934 and over the average of 1929-34.

168. FLORA, S. D. Climate of Kansas. Kans. State Bd. Agr. Rpt. 67(285), 320 p. June 1948. 2 K13Re

Compilation of Weather Bureau records for the State with some comparisons for other States. The earliest record was begun in 1836. Total damage from tornadoes, hail storms, and floods is given in dollars.

169. FOSCUE, E. J. The climate of the lower Rio Grande Valley of Texas. Monthly Weather Rev. 60: 207-214. Ref. Nov. 1932. 1 W37M

Chart gives yearly rainfall at Brownsville, 1871-1930. Effects of drought periods are noted.

170. FOSTER, E. E. Evaluation of flood losses and benefits. Amer. Soc. Civ. Engin. Proc. 67: 805-828. May 1941. 290.9 Am3P

Includes a "crop-loss" curve developed by the author.

Discussion, Amer. Soc. Civ. Engin. Proc. 67: 1377-1382, 1591-1602, 1933-1934, Sept.-Dec. 1941; 68: 332-338, Feb. 1942.

171. GREGORY, SIR R. Weather recurrences and weather cycles. Monthly Weather Rev. 58: 483-490. Ref. Dec. 1930. 1 W37M

Address before the Royal Meteorological Society, Jan. 15, 1929.

Survey of the literature including that relating to weather and crop forecasting. Concludes that results of studies of weather cycles are either indefinite or, if they are expressed precisely, they break down when tested over long periods.

Reprinted from Royal Met. Soc. London Q. J. 56: 103-120. Apr. 1930. 340.9 R81

Abstracts in Nature 125(3143): 132-134. 1930. 472 N21; Sci. Abs. Sec. A-Phys. 33: 558. 1930. 334.8 Sci2

Weather: Drought, Rainfall and Wind--Continued.

172. HOYT, J. C. Drought of 1936; with discussion on the significance of drought in relation to climate. U. S. Geol. Survey Water-Supply Paper 820, 62 p. 1938. 407 G29W

Tables 3 and 10 and figures 9 and 10 compare precipitation by months or groups of months with yields, expressed as a percent of the 10-year average, by States. A discussion of "climatic risks" appears on p. 52-53.

173. HOYT, J. C. Droughts of 1930-34. U. S. Geol. Survey Water-Supply Paper 680, 106 p. 1936. 407 G29W

Tables give annual precipitation by States, 1881-1934, precipitation and composite yields of crops per acre, 1929-34, by States; and years when large areas of the humid and semiarid States had deficiency in precipitation of 15 percent or more. Such deficiency is considered to indicate drought.

174. JOEL, A. H. Soil conservation reconnaissance survey of the southern Great Plains wind-erosion area. U. S. D. A. Tech. B. 556, 68 p. Jan.1937. 1 Ag84Te

Tables 14 and 15 give observations on dust storms at Amarillo, Texas, January 1933-February 1936, including date of storm, visibility, wind direction and velocity, duration of storm, number of storms per month and number causing erosion.

175. JOHNSON, M. B. Ranch organization and management in Western North Dakota. N. Dak. Agr. Expt. Sta. B. 237, 78 p. 1930. 100 N813

Includes analysis of weather conditions over the past 30 years.

176. KIENHOLZ, J. R. Weather cycles and fruit diseases at Hood River, Oregon. Plant Dis. Rptr. 27: 77-81. Ref. Feb. 1, 1943. 1.9 P69P

A 95-year rainfall cycle has been shown by studies of tree rings. Records for 1917-35 indicate the end of a dry cycle. During that period deficiency and physiological diseases came into prominence. Records for 1936-42 indicate the beginning of a wet cycle. Increased losses from fungous diseases are reported for those years. An estimated 2 to 3 percent of the apple crop was lost from scab (Venturia inaequalis) in 1942. Approximately 5 percent of the sweet cherries delivered to packers in 1942 were discarded because of brown rot (Monilinia spp.)). Some orchards producing more than 50 percent rotted fruit were left unpicked.

177. KIFER, R. S., and STEWART, H. L. Farming hazards in the drought area. U. S. Works Prog. Admin. Div. Social Res. Res. Monog. 16, 219 p. 1938. 173.2 W89Re

Causes of crop damage reported were drought, hail, soil blowing, smut and rust, insects, frost, excessive precipitation. Tables give percent of years each was reported and relative importance of each for selected farms in representative counties of the Northern, Central, and Southern Great Plains, based on farmers' experiences reported in the survey of 1935.

178. KINCER, J. B. Probable frequency of serious nation-wide droughts in the United States. Agr. Engin. 13: 145-147. June 1932. 58.8 Ag83

Variations in distribution of precipitation make comparisons on a national basis almost impossible. However, studies indicate that the drought of 1930-31 was the worst of record and that four others approaching it in severity occurred in 1894-95, 1910-11, 1917-18, and 1925-26. Records used cover 41 years, 1891-1931.

179. MCCOMAS, P. S., MULLINS, T., and LANGSFORD, E. L. Farming new land in the Yazoo-Mississippi Delta; problems of small, family-sized farms in the backwater area. U. S. Bur. Agr. Econ. F. M. 35, 46 p. June 1942. 1.941 L6F22

Table 6 gives frequency, dates, and duration of floods in this area. Flood damages are discussed and are summarized in Table 7.

180. MALIN, J. C. Dust storms. Kans. Hist. Q. 14: 129-144, 265-296, 391-413. May-Nov. 1946. Natl. Archives.

Pt. 1, 1850-60; Pt. 2, 1861-80; Pt. 3, 1881-1900.

181. MATTICE, W. A. Precipitation in the northern Great Plains. Monthly Weather Rev. 62: 445-447. Dec. 1934. 1 W37M

Charts show average annual and warm-season precipitation, and the percentage of the years 1894-1933 with less than 15 inches of precipitation.

182. MYRICK, D. C. Climate: the limiting factor in Hand County agriculture. U. S. Bur. Agr. Econ. FM 25, 50 p. June 1941. 1.941 L6F22

Weather: Drought, Rainfall and Wind--Continued.

The weather, especially dry and wet seasons and storms, is reported for most of the years 1881-1939 for Hand County, S. Dak. Tables and charts give precipitation by periods, 1893-1939, and daily for April-August, 1902-1939; temperatures daily for April-August, 1902-1939; frost-free periods; and droughts. Table 13 gives tentative annual estimates of rust losses of wheat in North Dakota, Minnesota, South Dakota and Nebraska, 1909-1936. Grasshopper and Russian thistle infestations are discussed.

183. RUSSELL, R. J. Dry climates of the United States, I-II. Calif. U. P. in Geog. 5: 1-41, 245-274. 1931-32. 500 C125G

I. Climatic map; II. Frequency of dry and desert years, 1901-20.

184. SARVIS, J. T. Grazing investigations in the northern Great Plains. N. Dak. Agr. Expt. Sta. B. 308, 110 p. Ref. 1941. 100 N813

Effects of drought upon the vegetation, p. 33-34.

185. SOUTH DAKOTA. STATE COLLEGE OF AGRICULTURE AND MECHANIC ARTS. EXTENSION SERVICE. The farm situation in the 1931 drought and grasshopper areas of South Dakota. S. Dak. State Col. Agr. Ext. Serv. Spec. C. 20, 56 p. 1932? 275.29 So85Sp

Table 2.-Number of years previous to 1930-31 when rainfall for the crop year and for the early growing season has been as low or lower than in 1930-31. Two stations gave five such years in more than 30 years of record. Other stations reported less than five years, one reporting no year in 56 years of record when rainfall was less than 1930-31.

The grasshopper outbreak was considered by entomologists to be the most wide-spread and devastating one in North America in 50 years.

186. STEPHENS, P. H. Why the dust bowl? J. Farm Econ. 19: 750-757. Aug. 1937. 280.8 J822

Tables give precipitation by decades at Leavenworth, Kansas, 1836-1936, and Las Animas, Colorado, 1867-1936. Chart gives annual precipitation at Dodge City, Kansas, 1875-1936. The agricultural development of the area is discussed.

187. STRASZHEIM, R. E., and FALCONER, J. I. The drought of 1930 in Ohio. Ohio State U. Dept. Rural Econ. Mimeog. B. 37, 19 p. 1931. 281.9 Oh32

Precipitation in 1930 was 27.00 ins. compared with the 1883-1929 average of 38.25 ins. or 71 percent of normal. Table 3, p. 10, gives the estimated yields of the major crops in Ohio for 1930 compared with the 10-year average.

188. TANNEHILL, I. R. Drought, its causes and effects. Princeton, Princeton U. Press, 1947. 264 p. Ref. 340 T15D

Includes effects on agriculture.

189. THORNTHWAITE, C. W., HOLZMAN, B., and BLUMENSTOCK, D. I. Climatic research in the Soil Conservation Service. Monthly Weather Rev. 66: 351-368. Rev. Nov. 1938. 1 W37M

Rainfall data from three eastern stations and six stations in the southern Great Plains and southern prairies are analyzed with regard to seasonal variations in rainfall intensity, storm duration, storm frequency, diurnal variations in rainfall, and length of rainless periods.

190. U. S. DEPT. OF AGRICULTURE. Climate and man. Yearbook of agriculture. Washington, 1941. 1248 p. 1 Ag84Y

Causes and results of floods, p. 566; Average annual number of days with thunderstorms and hail p. 729-730; Average dates of last killing frost in spring and first in fall, p. 744-745.

191. U. S. WORKS PROGRESS ADMIN. DIV. OF SOCIAL RESEARCH. Social problems of the drought area. U. S. Works Progress Admin. Res. B. (ser. 5) 1-3. 1937. 173.2 W89Ref

Contents: 1, Areas of intense drought distress, 1930-36, by F. D. Cronin and H. W. Beers, 54 p.; 2, The people of the drought States, by C. Taeuber and C. C. Taylor, 81 p.; 3, Relief and rehabilitation in the drought area, by I. Link, 57 p.

The first report includes tables giving distribution of counties in the Great Plains drought area by average percent of departure from normal rainfall, by average percent of normal crop and pasture conditions, by average percent change in the number of cattle; and indices of drought intensity and of drought effect in high-intensity areas.

192. VISHER, S. S. Drouths and floods in the United States. Econ. Geog. 19: 1-15. Jan. 1943. 278.8 Ec7

Includes discussion of the frequency of wet and dry crop seasons.

Weather: Drought, Rainfall and Wind--Continued.

193. WHITE, G. F. Human adjustment to floods; a geographical approach to the flood problem in the United States. Chicago, Ill., 1945. 225 p. Ref. 290 W583

Thesis (PhD) - Univ. of Chicago, 1942.

Includes discussion of agricultural losses from floods, summaries of surveys leading to recommendations by the U. S. Department of Agriculture under flood-control acts and noting value of flood-damage reduction, suggestions for changes in crops on flood plains, and discussion of possibility of insurance.

194. YARNELL, D. L. Rainfall intensity-frequency data. U. S. D. A. Misc. P. 204, 68 p. Aug. 1935. 1 Ag84M

Maps show maximum precipitations for periods of 5, 10, 15, and 30 minutes and 1, 2, 4, 8, 16, and 24 hours that may be expected to occur on an average of once in 5, 10, 25, 50, and 100 years, based on U. S. Weather Bureau data for about 30 years.

Hail

195. BOWMAN, E. K. Are there "hail belts" in Montana? Mont. Farmer-Stockman 1947: 39. June 1, 1947. 6 M764

Maps, based on reports of hail losses to the State Board of Hail Insurance and to all stock companies, show ratio of loss to risk written, by counties, 1919-40 and 1919-46. The study reveals no "hail belt."

196. COLORADO. STATE HAIL INSURANCE DEPT. Nineteenth report. Denver, 1947. 9 p. In Colo. Div. Agr. Ann. Rpt. 1947. 2 C713

Tables show number of acres insured and amount of losses paid, by counties and by crops.

197. COOKE, G. W. North Dakota state hail insurance, 1911-36. J. Business, U. Chicago 11: 277-307. July 1938. 280.8 J825

The eastern third of the State has an annual rainfall of about 20 inches but very little hail, except in four counties. Crop failures are infrequent and are then caused by rust or insects. The central part of the State has about a 17-inch rainfall and about twice as much hail. The western part has about a 15-inch rainfall and about four times as much hail. In some western counties "crop failures occur in about two out of every three years, although, because of the high productivity with correct climatic conditions, the average wheat yield over the 1919-33 period was only three bushels less in the western counties" than in the eastern (p. 285-286).

198. ILLINOIS. AGRICULTURAL EXPERIMENT STATION. A year's progress in solving farm problems of Illinois... Forty-fourth report for year ended June 30, 1931. Urbana, 1931. 304 p. 100 I16S

"A little less than one-half of 1 percent loss to crops in Illinois is attributed to hail each year" (p. 57-58).

199. KOCH, G. D. Meteorological aspects of hailstorms in Nebraska. Monthly Weather Rev. 65: 236-237. June 1937. 1 W37M

Tables give number of hailstorms by months and by hours of the day, based on data for 1924-36.

200. LEMONS, H. Hail as a factor in the regional climatology of the United States. Geog. Rev. 32: 471-475. July 1942. 500 Am35G

Maps show frequency of hail storms by months and seasons. Damage to crops is greatest in the Great Plains and Central Lowlands because the period of maximum frequency coincides with the main period of growth of the principal crops. On the Pacific Coast the hail period occurs in the off season for crops. Elsewhere hail storms are infrequent but unpredictable.

201. LEMONS, H. Hail in American agriculture. Econ. Geog. 18: 363-378. Oct. 1942. 278.8 Ec7

Table I gives losses from hail, annually, 1909-25, to specified crops. Distribution of hailstorms and injury to crops are discussed.

202. LEMONS, H. Semimonthly distribution of hail in the United States. Monthly Weather Rev. 71: 115-122. July 1943. 1 W37M

Maps show distribution by half months, based on data for 1899-1938. Charts give hourly distribution and width of track, based on data collected during 1926-39.

203. MONTANA. STATE BD. OF HAIL INSURANCE. Annual report, 32nd, 1948. Helena, Mont., 1949. 8 p. 284.69 M762

Shows location of destructive hail areas on the basis of the total loss claims against the State Hail Fund and all stock companies (p. 8).

Reports for 1945-47 give similar information.

Hail--Continued.

204. NORTH DAKOTA. HAIL INSURANCE DEPT. Annual report, 29th, 1947. Bismark, 1948. 70 p. 284.69 N814

Statistics include daily number and amount of losses reported to the Department, June-September each year, as well as acreage insured, cost, risk, and indemnity allowed by counties.

Issued annually. The report for 1930 summarizes data for the 12-year period, 1919-30.

205. REED, C. D. Hail damage in Iowa. Monthly Weather Rev. 59: 229-230. June 1931. 1 W37M

Assessors in Iowa collected reports of hail damage each year for eight years prior to 1931. Table gives for each year the total damage in the State, total amount of risk, percent of damage, number of townships reporting damage, largest county damage, largest township damage, and counties reporting no damage.

206. SASKATCHEWAN. MUNICIPAL HAIL INSURANCE ASSOCIATION. Directors' and auditor's reports ...for the year ended January 31, 1947 (season 1946). Regina, 1947. 19 p. 284.69 Sa7

Gives the number of hail storms for which claims were filed.

Issued annually.

Miscellaneous

207. ALLRED, C. E., ATKINS, S. W., and NESKAUG, S. R. Human and physical resources of Tennessee. Ch. XI. Plant diseases, animal diseases, insects, microbes. Tenn. Agr. Expt. Sta. Rural Res. Ser. Monog. 57, 184 p. Ref. Oct. 1, 1937. 173.2 W89Co

Includes statements from various sources of estimated losses in quantity or value from diseases or insect pests of plants and animals.

208. BEESON, K. E., ed. A study of the factors in successful corn growing reported by five-acre corn club members - 1942. Ind. Corn Growers' Assoc. Ann. Rpt. 43: 34-36. 1943. 59.9 In2

Of 1,216 growers reporting damage to their crops from all causes, 963 reported damage from corn borer; 255 damage from hail, floods or wet weather, 106 damage from other insects; 59 disease injury, mostly from leaf blight or wilt; 13 reported storm or wind damage, 15 injury from drought, and 9 injury from rodents.

209. BOSMAN, G. J. Successful farming depends on many factors. Farmer [Pietermaritzburg] 34(20): 6. May 18, 1945. 24 F227

Among the factors the farmer has to contend with are droughts, excessive rains, stock and plant diseases, untimely frost, destruction by hail, insect pests, and shortage of labor.

210. HUNTER, B., COCKERILL, P. W., and PINGREY, H. B. Type of farming and ranching areas in New Mexico. N. Mex. Agr. Expt. Sta. B. 261, 68 p. May 1939. 100 N465

The following biological factors causing losses and inconveniences are listed: Animal diseases, plant diseases, insect pests, internal parasites, rodents, predatory animals, and weeds.

Livestock Mortality

211. BURDICK, R. T., and PINGREY, H. B. Profits from winter feeding in northern Colorado. Colo. Agr. Expt. Sta. B. 394, 75 p. Oct. 1932. 100 C71S

Death loss for lambs averaged 2.7 percent over the 8-year period; for steers the average loss was 0.59 percent.

212. CARPENTER, G. A., CLAWSON, M., and FLEMING, C. E. Ranch organization and operation in northeastern Nevada. Nev. Agr. Expt. Sta. B. 156, 81 p. Nov. 1941. 100 N41S

In 1937, cattle death loss or disappearance varied from 1 1/2 to 4 percent, exceeding 10 percent on a few ranches and 30 percent on one ranch. Loss of mature sheep averaged about 15 percent and of lambs about 10 percent.

213. DISQUE, N. Know what livestock losses cost you. Successful Farming 46(10): 172, 174. Oct. 1948. 6 Su12

Summary of a survey by the Iowa State College Statistical Laboratory shows that one in five pigs farrowed died before they were 8 weeks old; losses of pigs past the weaning stage were 3.5 percent; about 9.8 percent of calves died within one month of birth but above that age the death rate was 2.2 percent; among chickens the death rate was about one in four.

Livestock Mortality--Continued.

214. GABBARD, L. P., BONNEN, C. A., and TATE, J. N. Planning the ranch for greater profit. A study of physical and economic factors affecting organization and management of ranches in the Edwards Plateau grazing area. Tex. Agr. Expt. Sta. B. 413, 45 p. July 1930. 100 T31S

"Death losses in the breeding herds varied from 0 to 8 per cent for cattle, from 1 to 20 per cent for sheep, and from 4 to 15 per cent for goats."-p. 35.

215. HERTEL, J. P., and HENDERSON, P. Origin, sex, value, and cause of death of farm horses. N. Y. Agr. Col. Farm Econ. 104: 2541-2544. Dec. 1937. 280.8 C812

Table 6 gives causes of death on 439 farms, 1932-1936. The number that died, percent, average age, and range of ages for each disease are reported.

216. MOLLIN, F. E. Disease as a problem in animal production. Amer. Soc. Anim. Prod. Proc. 30: 277-286. 1937. 389.9 Am3R

Loss from disease and other causes up to 5 percent is expected on cattle ranches and a larger loss on sheep ranches. Interest of producers in disease control is described.

217. MOSHER, M. L. Death losses of livestock on Illinois farms. Ill. Farm Econ. 145: 530-533. June 1947. 275.28 IL5

Includes cattle, sheep and hogs. Based on reports from farms cooperating in the Illinois Farm Bureau Farm Management Service, 1940-45.

218. MOSHER, M. L., and others. Three-year report of the Farm Bureau Farm Management Service on 150 farms in northeast Illinois, 1942-1943-1944. Ill. Agr. Col. Ext. AE2342, 24 p. Sept. 1945. 275.29 IL62P

F. J. Reiss, E. M. Hughes, and H. L. Jepson, joint authors.

Tables 6-9 give death losses, in pounds and percent of total produced, for the feeder-cattle, hog, sheep and poultry enterprises.

219. MOSHER, M. L., REISS, F. J., and BUDDEMEIER, W. D. Three-year report on 174 farms in the Blackhawk Farm Bureau Farm Management Service, 1943, 1944, and 1945. Ill. Agr. Col. Ext. AE2414, 23 p. Sept. 1946. 275.29 IL62P

Death loss in the feeder cattle enterprise averaged 1.8 percent; dairy cattle, 9.5 percent; mixed cattle, 9.5 percent; hog enterprise, 2 percent; sheep, 16.5 percent.

220. NODLAND, T. R., and POND, G. A. Feed costs and returns from feeder cattle and feeder sheep, 1940-1943. Minn. U. Div. Agr. Econ.Mimeog. Rpt. 149, 16 p. Nov. 1944. 281.9 M66

Death loss, p. 14.

221. NORDQUIST, A. V. Estimating livestock losses. U. S. Livestock Sanit. Assoc. Proc. (1946) 50: 199-208. 1947. 49.9 Un3R

Tables give annual estimates of death losses, 1941-45, by regions of the United States, for horses and colts, mules and mule colts, cattle, calves, hogs, sheep, and lambs. Bases for these estimates are discussed.

222. RANNEY, W. P., and POND, G. A. Annual report [8th] of the farm management service for farmers in southeast Minnesota for the year 1935. Minn. U. Div. Agr. Econ. Mimeog. Rpt. 72, 32 p. Mar. 1936. 281.9 M66

Death loss of cattle averaged 7 percent, of sheep 12 percent, and of hens 15 percent. Death loss is also given by counties.

223. TOWNSEND, G. Mountain farming in the Ozark area of western Arkansas; with particular reference to goat dairying as a use for low-grade land. U. S. Bur. Agr. Econ. F. M. 31, 31 p. Mar. 1942. 1.941 L6F22

Winter death losses among milk goats usually average about 10 percent. Causes of loss are malnutrition, stomach worms, and other parasitic infestation. Death losses among sheep are high.

224. U. S. BUR. OF AGRICULTURAL ECONOMICS. Meat animals - farm production and income, 1941-1942. Washington, 1943. 20 p. 1.9 Ec71Fp

Includes statistics by States of deaths of cattle and calves, 1941; hogs, sheep and lambs, 1941 and 1942.

225. VALGREN, V. N. Livestock insurance and mortality data. Amer. Ins. 22(4): 16-17. Apr. 1945. 284.68 J822

Analysis of data pertaining to cows from a mutual livestock insurance company in Ohio shows an average annual loss rate for the 6-year period, 1936-41, of 2.38 per 100. For horses the loss rate was 3.9 per 100. Data from three mutual livestock insurance associations in the South Central States for 1939-41 showed a loss of 8.33 per 100 horses, and 5.87 per 100 mules. Tables give losses by age.

Cattle

226. AHALT, A. M., and HAMILTON, A. B. Cost and advisability of raising dairy heifers. Md. Agr. Expt. Sta. B. A17: 145-180. Sept. 1942. 100 M36S
One cow in every 5.5 had to be replaced annually, because of either sale or death. Cost of raising replacements is given.

227. BLACKSTONE, J. H. Cost of producing fluid milk in Alabama. Ala. Agr. Expt. Sta. B. 265, 71 p. June 1948. 100 AL1S
Death loss averaged 4.5 percent on wholesale dairy farms and 3.7 percent on retail farms. Appendix table 5 gives causes of cow deaths on 90 wholesale and 29 retail farms in Alabama, 1945, and percent of total deaths due to each cause.

228. BRENNEN, C. A. Cattle production costs in Nevada in the years 1928, 1929, and 1930. Nev. Agr. Expt. Sta. B. 124, 54 p. Oct. 1931. 100 N41S
Death loss was 3.10 percent for all bulls, and 16.5 percent for bulls 7 years old and over. Loss was attributed to poor range, poisonous plants, disease, predatory animals, and theft.

229. BRENNEN, C. A. The main reasons why range cattle ranchers succeed or fail. Nev. Agr. Expt. Sta. B. 133, 22 p. Sept. 1933. 100 N41S
Average death loss, 1928-30, was 3.08 percent, average for 1928-32 was 4.58 percent. "Death loss among calves or older cattle is largely a management factor, since it is consistently held in check by efficient operators. Outside of losses due to poisonous plants and disease, death loss is usually traceable to insufficient range or winter feed" (p. 18).

230. BURDICK, R. T., and REINHOLT, M. North Park cattle production: an economic study. Colo. Agr. Expt. Sta. B. 435, 87 p. July 1937. 100 C71S
Losses of all cattle except calves averaged 3.17 percent for the three years 1929-31; losses of calves averaged 5.63 percent. Table 16 gives losses by classes for each year. Causes included effects of calving, accidents such as drowning, poison weeds, bloat, woody tongue, big jaw, cancer eye, and old age. In many cases the cause was unknown and many cattle were reported "missing."

231. CANNON, C. Y., and HANSEN, E. N. Expectation of life in dairy cows. J. Dairy Sci. 22: 1025-1032. Ref. Dec. 1939. 44.8 J822
Based on records of a cow-testing association and the Iowa State College.

232. CULLEY, M. J. An economic study of cattle business on a southwestern semidesert range. U. S. D. A. C. 448, 24 p. Ref. Dec. 1937. 1 Ag84C
The following causes of death are listed: Poisonous plants, worms, accidental injury, predatory animals, blackleg, other diseases, lack of feed, lack of water. Percentage loss from each cause is given for each year, 1924-34, inclusive. The problem of dry years is discussed.

233. INGELS, J., and CANNON, C. Y. The mortality of calves in the Iowa State College dairy herd. Amer. Soc. Anim. Prod. Proc. 1936: 223-229. 389.9 Am3R
Mortality was 18.4 percent up to freshening.

234. JENSEN, E., and others. Input-output relationships in milk production. U. S. D. A. Tech. B. 815, 88 p. Ref. May 1942. 1 Ag84Te
J. W. Klein, E. Rauchenstein, T. E. Woodward, and R. H. Smith, joint authors.
Table 18 gives the number of cows that died during the feeding experiments and the causes of death.

235. MERRICK, F., and EFFERSON, J. N. Farmer experience with the beef cattle enterprise in Louisiana. La. Agr. Expt. Sta. B. 353, 31 p. Aug. 1942. 100 L93
Reports experiences on 197 farms in 5 areas of the State for the year ended August, 1940. Average mortality rates varied from 9 percent to 5 percent, by area. Farmers reported highest losses in the late winter months and indicated that losses could be reduced by proper management.

236. NELSON, A. G., and KORZAN, G. E. Profits and losses in ranching, western South Dakota, 1931-1940. S. Dak. Agr. Expt. Sta. B. 352, 31 p. June 1941. 100 So82
"Average death loss on cattle ranches studied from 1931 to 1940 was 4.2 percent, which probably is high largely due to an extremely high death loss (about 8 percent) in 1936 and 1937 as a result of the 1936 drouth. When these years are excluded the death loss was 3.5 percent" (p. 16).

Cattle--Continued.

237. SAUNDERSON, M. H., and CHITTENDEN, D. W. Cattle ranching in Montana; an analysis of operating methods, costs, and returns in western, central and eastern areas of the State. Mont. Agr. Expt. Sta. B. 341, 32 p. May 1937. 100 M76
Death losses averaged 2 1/4-2 1/2 percent in the three groups of ranches. Causes included poisonous plants, calving, accident, bloat, disease, severe wintering conditions, and feed shortage.

238. SELBY, H. E., BURRIER, A. S., and BRANDT, P. M. Cost and efficiency in dairy farming in Oregon. Oreg. Agr. Expt. Sta. B. 318, 93 p. Sept. 1933. 100 Or3
Average death loss was 2 1/2 percent of the average number of cows annually. Causes of deaths are given.

239. SELBY, H. E., and KUHLMAN, G. W. Cost and efficiency in raising dairy heifers in Oregon. Oreg. Agr. Expt. Sta. B. 324, 38 p. Ref. June 1934. 100 Or3
The number of deaths from each of the following causes, as given by dairymen, is reported: Scours, indigestion, colic, etc.; accidents (drowning etc.); bloat; exposure (starving, freezing, etc.); strayed or stolen; poisoning; calving; and blackleg. Total death loss was 13 percent.

240. THOMAS, W. P., BLANCH, G. T., and HAYBALL, E. A study of farm organization by type of farm in Sanpete and Sevier Counties. Utah Agr. Expt. Sta. B. 300, 75 p. Nov. 1941. 100 Ut1
Death loss of cows was 1.8 percent on beef-cattle farms having less than 25 cows and 4.6 percent on farms having more than 25 cows.

Sheep

241. ADAMS, R. L. Data illustrating factors affecting the capacity to repay. Berkeley? Calif., 1939. 23 p. 281.010 Ad1D
Table 24 gives average annual death losses of mature sheep in Solano and Yolo Counties, Calif., 1931-35, and Mendocino County, 1936-37. Average ranged from 4.6 percent to 11.9 percent.

242. AYLESWORTH, P. F. Lamb feeding costs and returns in Michigan. Mich. Agr. Expt. Sta. Q. B. 16: 26-30. Aug. 1933. 100 M58S
Mortality ranged from none to 6.8 percent.

243. AYLESWORTH, P. F., WRIGHT, K. T., and LAVOI, D. H. 1933-34 lamb feeding costs and returns on 50 Michigan farms, Mich. Agr. Expt. Sta. M-124, 15 p. Aug. 1934. 275.29 M581
Mortality averaged 4.2 percent, and ranged from none to 16.8 percent.

244. BELL, D. S. Dead lambs tell tales. Natl. Wool Grower 37(12): 20-21, 38-39. Dec. 1947. 45.8 N21N
A study of lost potential for flock profit through fetuses which failed to survive, based on records of two flocks at the Ohio Agricultural Experiment Station, 1939-44.

245. BROADBENT, D. A., BLANCH, G. T., and THOMAS, W. P. An economic study of sheep production in southwestern Utah. Utah. Agr. Expt. Sta. B. 325, 64 p. Aug. 1946. 100 Ut1
Death losses, p. 48-50. Records from 71 ranches for 1939-41 showed average death losses of stock sheep as 9 percent and of lambs as 6.4 percent. Principal known causes were poison plants and predatory animals.

246. CALIFORNIA UNIVERSITY. AGRICULTURAL EXTENSION SERV. Final report, North Coast counties sheep management study. Berkeley, 1945. 21 p. 275.29 C12En
The study was started in Mendocino County in 1931 and in Marin, Sonoma, and Lake Counties in 1938. It was completed in 1943. Progress reports were issued each year. The area was divided into the following climatic zones: Coast, with high rainfall and a long green-feed period; Semicoast, with fairly plentiful rains but shorter green-feed period; Mountain-semicoast, similar to above except largely of high mountains with more severe storms, snow and sometimes heavy death loss; Interior, with short green-feed period. Averages for the longest period any individual flock provided continuous records of 5 years or more, showed death losses among mature sheep of from 3 to 13 percent. The 13-year record for Mendocino County showed losses of from 6 to 13 percent. Weather was responsible for most high losses although the low value of cull ewes and failure to cull in 1932 and 1933 contributed to high death losses in those years.

Sheep--Continued.

247. CANADA. DEPT. OF AGRICULTURE. AGRICULTURAL ECONOMICS BR. An economic survey of range sheep production in western Canada, by L. E. Kindt. Ottawa, 1933. 42 p. 281.345 C16

Death losses were caused by "heaving" (a lung disease), 31.8 percent; poisonous plants, principally death camas, 11.2 percent; coyotes, 2.3 percent; bad water, dogs, worms, maggots, blizzards, poverty, etc., 54.7 percent.

The report for 1934 gives percentage death loss on each ranch but does not give causes.

248. COLORADO. AGRICULTURAL EXPERIMENT STATION. Preliminary report on the cost of feeding lambs in northern Colorado for the 1931-32 feeding season, by R. T. Burdick and H. B. Pingrey. Fort Collins, 1932. 17 p. 281.345 C71

Death loss averaged 4.08 percent, compared with an eight-year average (1922-29) of 2.7 percent.

249. DAVIS, G. B., and MUMFORD, D. C. Farm organization and financial returns in the lower Powder River Valley, Baker County, Oregon. Oreg. Agr. Expt. Sta. B. 406, 56 p. Mar. 1942. 100 Or3

Tables give comparisons of high and low income beef cattle ranches, sheep ranches, dairy farms, and crop farms, for 1939. Sheep death losses ranged from 5.5 to 8.5 percent and averaged 7.3 percent.

250. DOWSETT, C. P. The Australian sheep industry and the drought. Rural Bank N. S. Wales. Farm Front 5: 126-132. Sept. 1947. 281.9 R883

Drought increased death losses from an average of 5 percent for the five seasons ending 1943/44 to 12 percent in 1944/45, 10 percent in 1945/46, and 6 percent in 1946/47.

251. ENGENE, S. A., and POND, G. A. A preliminary report of livestock costs and returns from data secured in 1939 on the farm accounting route in Winona County, Minnesota. Minn. U. Div. Agr. Econ. Mimeog. Rpt. 116, 20 p. June 1940. 281.9 M66

Average death loss, 1939, for sheep was 10 percent; 1935-39, 11 percent. Average death loss, 1939, for lambs was 14 percent; 1935-39, 12 percent. Average death loss, 1939, for poults was 26 percent; 1936-39, 29 percent.

252. FAVRE, C. E., and PHINNEY, T. D. Managing farm flock sheep for greater profit in Southern Idaho. Idaho Agr. Expt. Sta. B. 228, 16 p. Mar. 1939. 100 Id1

Flocks grazed in cooperative bands on forest range are compared with flocks kept on the farm the entire year. Losses were 5.3 percent of the ewes and 6.6 percent of the lambs on range and 3.4 percent of the ewes and 1.7 percent of the lambs in the farm flocks. Causes of summer loss on range included poisonous plants, predatory animals and straying.

253. KELSO, M. M. Cost of production and income in sheep and wool. Mont. Wool Grower 21(1): 29-31. Jan. 1947. 45.8 M762

Death loss of ewes averaged 6 percent in 1944 in Montana, based on a study of 38 ranches by Montana Agricultural Experiment Station.

254. LAMONT, T. E., and PARSONS, M. S. A farm management study and costs and returns on sheep, Yates County, 1939. N. Y. Agr. Col. A. E. 314, 68 p. Apr. 1940. 281.9 C81

Average death loss of sheep was 5 percent.

255. NODLAND, T. R., and POND, G. A. Managing sheep for greater returns. Minn. Agr. Expt. Sta. B. 382, 12 p. Ref. 1945. 100 M66

Death loss, 1928-37, averaged 9 percent. Relation of amount of death loss to various sheep production factors is shown in Table 8.

256. SHANNON, A. T. Fat lamb farming. New Zeal. J. Agr. 70: 277, 279-281, 283-285, 287. Mar. 15, 1945. 23 N48J

Costs and returns. Normal death rate is given as approximately 9 percent.

257. STUCKY, H. R. Sheep ranch costs. Mont. Wool Grower 20(2): 7, 9, 28-29. Feb. 1946. 45.8 M762

A study of 38 sheep ranches in Montana in 1945. Gives percentage of ewe and lamb losses. Most important ranch problems are labor, coyotes, water and worms.

258. UNIVERSITY COLLEGE OF WALES. DEPT. OF AGRICULTURAL ECONOMICS. Cost of fat lamb production on lowland farms in Wales in 1945-6, by B. H. Roberts. Aberystwyth, 1947. 12 p. 281.9 Un32C

Loss up to weaning was about 11 percent of the lambs born (p. 10).

259. UNIVERSITY COLLEGE OF WALES. DEPT. OF AGRICULTURAL ECONOMICS. Hill sheep--a study of costs and returns on 48 Welsh farms during 1945-46, by B. H. Roberts. Aberystwyth, 1948. 19 p. 281.9 Un32H

Table 5 gives deaths per 100 ewes by class of sheep (ewes, wethers and rams, lambs) and flock size groups.

260. WALKER, A. L., LANTOW, J. L., and PICKRELL, K. P. Economics of sheep production in western New Mexico. N. Mex. Agr. Expt. Sta. B. 204, 51 p. May 1932. 100 N465

The study covered three years ending December 31, 1929. Average percentage of death loss on 12 ranches was 6.2. Causes of death reported were poisonous plants, hemorrhagic septicaemia, and shortage of forage, perticularly browse, during severe winter weather.

Swine

261. DAWE, C. V., and TRIST, P. J. O. A survey of pig management. Bristol U. Dept. Agr. and Hort. B. 17, 47 p. 1936? 10 B775

Mortality, p. 33-35. Reports from 15 farms, 1935/36, showed 14 percent loss from birth to weaning, and 22 percent total death loss. Causes of death are given also.

262. DOWLER, J. F. Variations in livestock production costs and returns in Putnam County. Ohio Agr. Expt. Sta. B. 495, 37 p. Dec. 1931. 100 Oh3S

The study is based on data collected from 23 farms during the 3 years 1926-28. Suckling pig losses ranged from 14 to 57 percent, averaging 25 percent for all farms. Causes of loss were born dead, born weak, lain on by sow, frozen or chilled, starved, sow died, eaten by sow, flu, sunstroke, worms, injury. Losses between weaning and marketing averaged 3.4 percent of the total pork produced.

263. MENZIES-KITCHIN, A. W. An economic study of pig production. A comparative study of conditions in the eastern counties of England during 1936/37. Cambridge U. Dept. Agr. Farm Econ. Br. Rpt. 25, 49 p. Oct. 1937. 281.9 C14

Pre-weaning mortality, p. 20-22; Post-weaning mortality, p. 27-29. Tables give causes of death.

264. MENZIES-KITCHIN, A. W. Fertility, mortality, and growth rate in pigs. J. Agr. Sci. [London] 27: 611-625. Refs. Oct. 1937. 10 J822

Percentage death rate tends to increase with farrow number. Litters containing more than 12 pigs show an increase in death rate. Post-weaning mortality appears to increase with increase in litter variation.

265. MENZIES-KITCHIN, A. W. Pre-weaning and post-weaning mortality in pig production. Farm Econ. 2: 126-129. July 1937. 281.8 F223

Includes statistics of causes of death.

266. NODLAND, T. R., and POND, G. A. Managing hogs for greater returns. Minn. Agr. Expt. Sta. B. 379, 23 p. June 1944. 100 M66

Table II gives relation of amount of death loss to various swine production factors, 1928, 1931, 1934, and 1937.

267. STEWART, H. A. A study of factors affecting survival from birth to weaning weight of the litter in swine. J. Anim. Sci. 6: 288-296. Ref. Aug. 1947. 49 J82

Effects of inbreeding, size of litter and birth weight on survival.

268. UNDERWOOD, F. L. An analysis of peanut-cotton-hog farm businesses in a depression year. Va. Agr. Expt. Sta. Tech. B. 67, 103 p. July 1940. 100 V81S

Death losses of hogs, p. 63-66. Tables give death losses before and after weaning in relation to pork production.

269. WILCOX, R. H., CARROLL, W. E., and HORNUNG, T. G. Some important factors affecting costs in hog production. Ill. Agr. Expt. Sta. B. 390, 60 p. June 1933. 100 IL6S

Records from 22-34 farms during the years 1923-26 are analyzed, including the effect of death losses on the costs of production. Following are the causes of death listed: Crushed by sow, farrowed dead, farrowed weak, starved by blind teats, chilled, sore mouth, eaten by sow, scours, necrotic enteritis, injured by other stock, thumps, castration, worms, cholera, strayed or stolen.

Poultry

270. ABELL, M. F. Economic analysis of fourteen years of poultry records. N. H. Agr. Expt. Sta. C. 75, 31 p. June 1947. 100 N45

Relation of adult mortality to labor income per hen is included.

Poultry--Continued.

271. AYLESWORTH, P. F. Cost of producing pullets in 1933. Mich. Agr. Expt. Sta. Q. B. 16: 148-153. Feb. 1934. 100 M58S

Mortality averaged 15.2 percent and varied from 0 to 52.5 percent.

272. BAUSMAN, R. O. Influence of management practices on cost of producing broilers in Delaware. Del. Agr. Expt. Sta. Pam. 28, 9 p. June 1947. 100 D37H

"Good management requires that the mortality rate should not greatly exceed six percent." Table 3 gives the influence of mortality on costs and returns, Feb. 1-Sept. 1, 1946. Mortality averaged 13.1 percent.

273. BROADBENT, D. A., THOMAS, W. P., and BLANCH, G. T. Preliminary report of an economic analysis of turkey production in Utah, 1942. Utah Agr. Expt. Sta. Mimeog. Ser. 306, 16 p. Feb. 1944. 100 Ut1Mi

Mortality in some flocks was as high as 60 percent. Average was 41 percent for high-mortality flocks and about 12 percent for low-mortality flocks.

274. CALIFORNIA UNIVERSITY. AGRICULTURAL EXTENSION SERV. Efficient management practices: not wishful thinking; a 1947 study of fifteen Los Angeles County poultry ranches together with various comparisons for the past nineteen years. Los Angeles, 1948? 16 p. 275.29 C12En

Mortality and loss averaged 17 percent in 1947 and 28 percent for the 19 years. Pullet mortality and loss averaged 12.1 percent in 1947 and 13.5 percent for the 7 years reported.

275. CALIFORNIA UNIVERSITY. AGRICULTURAL EXTENSION SERV. 1947 poultry management cost study, Riverside County, first annual report. Riverside, 1948? 6 p. 275.29 C12En

Based on reports from five enterprises, mortality averaged 18.5 percent.

276. CALIFORNIA UNIVERSITY. AGRICULTURAL EXTENSION SERV. 1947 poultry management study, San Bernardino County; seventeenth annual report. A comparison of the practices of fourteen poultry farms. San Bernardino, Calif., 1948. 8 p. 275.29 C12En

Mortality averaged 15.8 percent. Percentages for each farm and averages for preceding years are also given. Reports for the years 1933 and 1939-46 give similar statistics for the farms reporting.

277. CALIFORNIA UNIVERSITY. AGRICULTURAL EXTENSION SERV. Sixth annual summary, poultry enterprise efficiency study, Riverside County, California, June 1, 1934 to May 31, 1935. Berkeley? 1935. 9 p. 275.29 C12En

Mortality averaged 32.6 percent for 1934 and 28.1 for the six years 1929-34. Statistics are also given for each of the six years and for each of the cooperating farms in 1934.

278. CALIFORNIA UNIVERSITY. AGRICULTURAL EXTENSION SERV. Twentieth annual summary of the Sacramento County poultry management study for the record year, March 1, 1947 to February 29, 1948. Sacramento, 1948. 16 p. 275.29 C12En

Mortality for the year was 14 percent and for the 20-year average 19.5 percent. Percentage for each of the 20 years is also given.

Similar statistics are given in each of the preceding reports.

279. CHARLES, T. B., and STUART, H. O. Commercial poultry farming. Ed. 5. Danville, Ill., Interstate, 1946. 544 p. 47 C382

Table 66, Culling and Mortality, gives percent mortality by months, 1937/38-1940/41.

280. CREEK, C. R., and MOSER, R. E. Returns from poultry farming in Mass. in 1943; a summary of poultry account records. Mass. Agr. Expt. Sta. FM-17, 27 p. Aug. 1944. 100 M382

Percent mortality by months is given in Table 15.

281. DEVAULT, S. H., and INGERSOLL, M. An economic study of 147 turkey flocks in Maryland. Md. Agr. Expt. Sta. B. 355: 145-176. Aug. 1933. 100 M36S

Mortality was 29 percent in the most profitable flocks and 39 percent in the least profitable. Causes of death were blackhead, intestinal worms, coccidiosis, other diseases, and accidents.

282. FERGUSON, C. M. A survey of adult mortality among laying flocks of the Middle West. U. S. Egg & Poultry Mag. 43: 275-276. May 1937. 286.85 Eg3

Excerpts from a paper prepared for the Ohio Conference on Adult Mortality Among Laying Flocks in the Middle West. Average mortality in the States studied is 18.8 percent, an increase of 70 percent or more in the past 12-15 years. Table gives mortality by States.

283. FRAZIER, R. F. Broiler production in the Gainesville, Georgia, area. Atlanta, Ga., Dairy and Poultry Br. U. S. Off. Distribution, 1944. 21 p. 1.9422 Po2B78

Chick mortality is the greatest hazard. Highest mortality in this area is from October to December, inclusive. Mortality rates of "shipped chicks" are higher than of those hatched locally. Cold is the principal cause of loss.

284. GREENE, R. E. L., and JAMES, H. B. Cost of producing broilers. Res. and Farming [N. C. Sta.] Prog. Rpt. 4(1): 2-3. Oct. 1945. 100 N81R

Costs for the period May 16, 1944, to May 15, 1945, are given in Table 1. Mortality varied from 19 percent in summer to 13 percent in winter.

285. HAYS, F. A. Mortality studies in Rhode Island Reds. Mass. Agr. Expt. Sta. B. 420, 20 p. Ref. Nov. 1944. 100 M38H

Mortality records for eight generations of pedigreed experimental stock hatched 1935-42 for the following periods: the first 8 weeks, 8 weeks to 6 months, 6-18 months.

286. HAYS, F. A. Mortality studies in Rhode Island Reds. II. Mass. Agr. Expt. Sta. B. 442, 8 p. July 1947. 100 M38H

Experiments from which it is concluded that heredity plays an important part in mortality rate. Mortality rates are given for the first eight weeks, eight weeks to six months, and six to eighteen months.

287. HOFFMAN, H. A., and STOVER, D. E. An analysis of thirty thousand autopsies on chickens. Calif. Dept. Agr. B. 31: 7-30. Ref. Jan.-Mar. 1942. 2 C12M

Based on records, 1931-40, of autopsies on all chickens received from an area in northern California. Gives causes of death, frequency of diseases, percentage distribution of each disease by age groups, and in some cases relation to rainfall.

Reviewed by H. L. Walster in N. Dak. Agr. Expt. Sta. Bimo. B. 4(5): 8-9. May 1942. 100 N813

288. JULL, M. A. The mortality problem. U. S. Egg & Poultry Mag. 40(7): 28-31, 60-63; (8): 44-47, 61-63. Ref. July-Aug. 1934. 286.85 Eg3

1, Embryo mortality; 2, Chick mortality; 3, Laying hen mortality. Reports from various States and the work of the U. S. Bureau of Animal Industry are commented upon from the breeder's viewpoint.

289. MISNER, E. G., and LEE, A. T. M. Economic studies of poultry farming in New York. I. Commercial poultry farms, 1926, 1929, 1930, 1931, 1932, 1933. N. Y. (Cornell) Agr. Expt. Sta. B. 684, 118 p. Dec. 1937. 100 N48C

Farms with the lowest mortality averaged 11.1 percent of the number of layers at the beginning of the accounting year; those with highest mortality averaged 32.1 percent. Relation of mortality to labor income and to cost of eggs per dozen is given.

290. MOORE, A. C. Chill - chick-rearer's enemy No. 1. Poultry [London] 94: 20. Jan. 11, 1944. 47.8 P869

Estimates that 90 percent of deaths of chicks are caused by chill.

291. POFFENBERGER, P. R., DEVAULT, S. H., and HAMILTON, A. B. An economic study of the broiler industry in Maryland. Md. Agr. Expt. Sta. B. 390: 427-463. Jan. 1936. 100 M36S

Of the 109 broiler farms studied, those averaging 10,152 birds showed a mortality of less than 10 percent, while those averaging 3,726 showed 25-30 percent. About 36.7 percent of all losses occurred during the first 2 weeks, 27.7 percent at 2-6 weeks, 21.8 percent at 6-9 weeks, 10.3 percent after 9 weeks of age, and 1.5 percent from accident. Major causes of death were coccidiosis, bronchitis, weak birds and lack of vitality, white diarrhea, colds, and leg weakness.

292. POFFENBERGER, P. R., and DEVAULT, S. H. An economic study of the broiler industry in Maryland. Md. Agr. Expt. Sta. B. 410, 54 p. Sept. 1937. 100 M36S

Average mortality for the two years July 1, 1934-June 30, 1936 was 15.5 percent. Table 25 gives mortality according to age. Major causes of death were reported as coccidiosis, bronchitis, weak chicks and lack of vitality, white diarrhea, colds, and leg weakness.

293. RICE, J. E., and BOTSFORD, H. E. Practical poultry management. Ed. 4. New York, Wiley, 1940. 604 p. 47 R362

Because of the small size of the fowl, disease may progress unobserved, individuals may disappear without being missed. Because of the short life of the fowl, risks

Poultry--Continued.

from incubation, brooding, and rearing are frequent. Risks from climate, diseases, parasites, predators, and fire are also mentioned (p. 578).

294. SCANLAN, J. J. Co-op turkey insurance fills important need. News Farmer Coop. 11(8): 3-4, 20. Nov. 1944. 166.2 N47

A study by the Farm Credit Administration in 1942 showed an average turkey mortality of 24 percent. Causes of mortality were: Disease, 34.7 percent; weather, 4.6 percent; accident, 3.5 percent; predatory animals, 1 percent; theft, 0.2 percent; and missing, unknown and miscellaneous causes, 56 percent.

295. STAFSETH, H. J., and WEISNER, E. S. Causes of mortality in laying hens. Mich. Agr. Expt. Sta. Q. B. 13: 153-157. Feb. 1931. 100 M58S

From records of autopsies of all hens entered in the Michigan International Egg Laying Contest the number of deaths from each disease or cause of death is reported. Mortality averaged 18.98 percent.

296. THOMPSON, W. C. Poultry mortality from a business viewpoint. N. J. Agr. Expt. Sta. B. 591, 16 p. Sept. 1935. 100 N46S

"In the average flock, a normal mortality rate of approximately 5 to 10 per cent must reasonably be expected each year, even though all management and environmental factors are provided at as near optimum as present knowledge permits."-p. 12. Table 5 shows causes of mortality in the flocks studied for the months of November, February, April, July and September.

297. WEAVER, C. H. A study of the causes of mortality in groups of the single comb white leghorn and barred Plymouth rock breeds of fowl: including a comparison between production and mortality. World's Poultry Cong. (1930) 4: 379-390. Ref. 47.9 W894

Production figures were compiled from 4,000 White Leghorns and 1,810 Plymouth Rocks in the Canadian and Ontario egg-laying contests during the five years, 1924/25-1928/29. Mortality figures were from autopsies on cadavers of all deaths in the stock; i. e. 866 White Leghorns and 391 Plymouth Rocks. Total and percentage of deaths from each of 19 diseases are recorded for each breed.

298. WEISNER, E. S. Death losses increasing in pullet flocks. Mich. Agr. Expt. Sta. Q. B. 20: 80-85. Nov. 1937. 100 M58S

Autopsies have been made to determine the cause of death of pullets entered in the Michigan Egg Laying Contest from 1922 to 1937. Table 1 shows number of deaths from each disease or condition. Average mortality for the 15-year period was 22.122 percent. At the time the contest was begun 10-15 percent was considered normal mortality.

299. WILCOX, R. H., and ALP, H. H. A study of turkey production costs in Illinois, 1945. Ill. Agr. Col. Ext. AE2401, 11 p. June 24, 1946. 275.29 IL62P

Includes discussion of mortality which averaged 9.6 percent for breeder flocks and 6.4 percent for market flocks. Pullorum and failure to start eating are mentioned as causes of losses during the first 10 days; unsanitary conditions, loss of green feed, and stampede from fright caused by dogs, storms, etc. are possible causes of loss during the fourth month when mortality percentage rises again.

300. WOODWARD, E. D. Taking the guesswork out of calculating the cost of producing eggs; a summary of production and returns of thirty poultry farms, covering a total of over thirty-eight thousand birds, conducted by the Department of Agricultural Economics, University of British Columbia, for a twelve months' period during 1943-1944. Canada Poultryman 31(9): 5-7. Sept. 1944. 47.8 C166

Table showing results of high and low flocks gives average mortality as hens, 24.99 percent; pullets, 23.92 percent; and flock, 24.30 percent.

Property Risks

Fire and Lightning

301. ADAMS, T. M. Factors affecting farm fire losses in Vermont. Vt. Agr. Expt. Sta. B. 524, 27 p. June 1945. 100 V59

Reported causes of farm fires, p. 10-12. Figure 8 gives seasonal variations in farm fires resulting from major causes.

302. ADAMS, T. M. Fire waste on Vermont farms, a preliminary report. Vt. Agr. Expt. Sta. Pam. 9, 12 p. Jan. 1944. 100 V59P

Annual farm fire loss in Vermont is more than 700,000. Causes reported are defective chimneys, 32 percent; lightning, 20 percent; defective heating systems, 13 percent; smoking and matches, 8 percent; gasoline and kerosene, 7 percent; defective wiring, 4 percent; sparks on roof, 4 percent; hot ashes, 3 percent; and other known causes, 9 percent.

303. BENNETT, R. R., and TETER, N. C. Tobacco barn fire loss summary. N. C. Agr. Col. Ext. Folder 72, 12 p. Apr. 1947. 275.29 N811Ex

Table gives causes of losses as reported by growers.

304. GIESE, H. The Iowa rural fire prevention program. Agr. Engin. 25: 19-20. Jan. 1944. 58.8 Ag83

Rural fires in Iowa totaled 1,814 in 1939, 1,449 in 1940, 1,237 in 1941, and 951 in 1942.

305. GIESE, H. Iowa's rural fire waste problem. Des Moines, Iowa, 1939. 12 p. 296.6 G36

Reprinted from the Proceedings of the 58th Annual Meeting and Convention of the Iowa Association of Mutual Insurance Associations, 1938, p. 46-57. Reports results of Project 23 of the Iowa Agricultural Experiment Station, entitled An Investigation of Farm Building Losses Due to Wind and Fire.

Charts show losses in dollars; number of fires; value and number of building losses; value of losses of dwellings and barns by cause of fire; value and number of losses from four principal causes; defective flues and heating systems, sparks on roofs of dwellings, lightning (barns, not rodded), spontaneous ignition; value and number of losses from roof fires; and fires per 1000 farms. The report covers 16,924 rural fires, 1930-37.

306. GIESE, H., and ANDERSON, E. D. Rural fire waste in Iowa, 1930-31. Iowa Agr. Expt. Sta. B. 296: 223-258. Ref. Nov. 1932. 100 Io9

Unknown causes accounted for 25 percent of the fires. The seven major known causes were defective flues, sparks on roofs, lightning (buildings without rods), burning buildings nearby, spontaneous combustion of hay and straw, defective heating systems.

307. HUNTER, K. H. Classification and rating of farm fire risks. U. S. Farm Credit Admin. Coop. Res. and Serv. Div. B. 46, 44 p. May 1941. 166.2 B87

The study was based on records of three farmers' mutual fire insurance companies in the Shenandoah Valley of Virginia, one for a 10-year period, 1929-38, the other two for the 5-year period, 1934-38. Relative importance of various causes of fires is given in Table 4. Hazards to be considered in developing a classification system are listed, p. 36-38.

308. HUNTER, K. H. Defense against nature's blitzkrieg. News for Farmer Coops. 8(6): 12-13, 21. Sept. 1941. 166.2 N47

Experience of Indiana insurance companies indicates an average annual cost of lightning losses as 0.7 cents per $100 of insurance for rodded barns and 10.1 cents for unrodded barns. Nearly 87 percent of livestock losses were charged to lightning, amounting to 15.2 cents per $100 of insurance in force on livestock.

309. IOWA STATE COLLEGE. AGRICULTURAL EXTENSION SERVICE. Fire, friend or foe? Ames, Iowa, 1943. 11 p. 275.2 Io92Fir

Includes a table showing yearly average (1930-39) number of country fires per 1000 farms in Iowa (p. 4).

Fire and Lightning--Continued.

310. IOWA STATE FIRE MARSHALL. Annual report, 37th, 1947 Des Moines, 1948. 36 p. 296.69 Io9
Amounts of insured losses are shown for farm houses, barns, and other buildings and equipment (p. 32-33).

311. LEWIS, A. B. Farm fire insurance and fire losses on different classes of land. N. Y. Agr. Col. Farm Econ. 81: 1955-1959. June 1933. 280.8 C812
Based on data collected by the Dryden and Groton Cooperative Fire Insurance Company, 1920-30. Number and size of lightning and accidental fire losses are given by land class.

312. NATIONAL BD. OF FIRE UNDERWRITERS. Safeguarding the farm against fire. New York, 1942. 61 p. 296.6 N212Sa
Principal causes of farm fires are lightning 31 percent; defective chimneys and flues 15 percent; sparks on roofs 11 percent; stoves, furnaces and their pipes 7 percent; matches and smoking 7 percent; petroleum and its products 6 percent; hot ashes and coals, including open fires 5 percent; spontaneous ignition 4 percent; misuse of electricity 3 percent.

313. OREGON. STATE FIRE MARSHALL. Annual report, 1947. Salem, Oreg., 1948. 86 p. Libr. Cong.
Shows amounts of insured losses by counties on farm barns, outbuildings, crops, etc., and on rural and farm dwellings (p. 64-70). In reports prior to 1942 losses on farm dwellings were given separately.

314. PETERSON, A. W., BRANDOW, G. E., and POWELL, W. Classification of farm property for fire insurance rates. N. Y. Agr. Col. A. E. 385, 17 p. Jan. 26, 1942. 281.9 C81
Classification according to risk.

315. PETERSON, A. W. Fire and lightening losses on different kinds of property. N. Y. Agr. Col. Farm Econ. 117: 2903-2904. Feb. 1940. 280.8 C812
The author analyzes the experiences of a group of insurance companies in New York State, 1934-38, in an effort to measure the risk of loss from fire and from lightning on dwellings, household, barns, produce, machinery and livestock under various conditions.

316. PETERSON, A. W. The relationship of economic factors to fire losses on mortgaged farms. N. Y. Agr. Col. Farm Econ. 110: 2679-2682. Nov./Dec. 1938. 280.8 C812
For 2,867 mortgaged New York farms, 1925-36, tables 1-6, based on land class, give figures pertaining to frequency of fires, average loss per large fire, average insurance per farm, average loss from large fires per $1,000 insurance, frequency of large fires and ratio of losses to insurance related to insurance per farm, and frequency of large fires and ratio of losses to insurance related to amount of mortgage. "The 'burning ratio' of the group of farms with the largest mortgages in each land class was from two to two and one-half times the ratio of the group with the smallest mortgages" (p. 2681).

317. POFFENBERGER, P. R., DEVAULT, S. H., and GOLDSBOROUGH, G. H. Farmers' mutual fire insurance in Maryland. Md. Agr. Expt. Sta. B. A5: 123-144. Nov. 1941. 100 M36S
The average loss per fire was $441 in 1939, $370 in 1937, and $762 in 1932. Average number of fires and losses per fire by counties are shown in Figure 4. Percentage distribution of the 3,834 fires in 1939, by causes, is shown in Table 6.

318. POWELL, W. Factors affecting the costs of cooperative farm fire insurance. N. Y. (Cornell) Agr. Expt. Sta. Rpt. (1938) 51: 75. 1939. 100 N48C
The relations between fire losses and labor incomes, general price level, farm real estate values, intensity of land use, and size of mortgages, are noted.

319. POWELL, W., and PETERSON, A. W. Factors affecting the costs of cooperative farm fire insurance. N. Y. (Cornell) Agr. Expt. Sta. Rpt. (1939) 52: 97. 1940. 100 N48C
Studies indicate that on poor land fire hazards are more frequent and physical conditions that help to put out fires are less general.

320. ROPER, W. L. Lightning strikes the farm. Your Farm 1(4): 41-44. Dec. 1942. 6 Y8
Fifteen percent, or nearly $50,000,000 of our national annual fire loss is caused by lightning. Properly installed lightning rods will prevent this loss of farm property. Most deaths from lightning occur in the rural regions. Estimates place deaths at 500 annually, and injuries at 1,500.

321. SECOR, A., ED. Prevention and control of farm fires. A handbook on the causes of fires and best methods of safeguarding against loss of life and property. Chicago, 1932. 167 p. Ref. 296.6 Se2
This handbook was compiled under the direction of a joint committee authorized and appointed by the Agricultural Committee of the National Fire Waste Council of Washington, D. C., and the Farm Fire Protection Committee of the National Fire Protection Association of Boston, Mass.
Causes of rural fires are given as defective chimneys and flues, 14 1/2 percent; lightning, 10 percent; sparks on roof, 8 percent; gasoline and petroleum products 7 1/2 percent; matches and smoking 6 percent; spontaneous ignition 5 percent; stoves, furnaces and their pipes, 4 percent; hot ashes and coals, including open fires, 2 percent; miscellaneous and unknown, 43 percent.

322. U. S. BUR. OF AGRICULTURAL ECONOMICS. Method of estimating farm fire losses in the United States, by R. R. Botts and E. E. Houseman. Washington, 1948. 10 p. 1.941 A22M562
Using the method described, farm fire losses are estimated for 1937-47.

323. U. S. FARM SECURITY ADMIN. Fire loss. U. S. Farm Security Admin. RR Family Prog. Rpt. 4, 3 p. May 15, 1942. 1.95 F21
Based on reports of borrowers under the Farm Security program. One in every seven borrowers reported a loss.

324. U. S. FARM SECURITY ADMIN., REGION III. Accident and fire survey in Region III...including the States of Iowa, Illinois, Indiana, Missouri and Ohio, by E. R. Beckner and W. C. Crozer. Indianapolis, Ind., 1941? 41 p. 1.9503 Ac2
Results of the survey are tabulated and analyzed in detail, including causes.

325. ZAYLSKIE, J. J. North Dakota's fire loss trend. N. Dak. Agr. Expt. Sta. Bimonthly B. 9: 84. Jan./Feb. 1947. 100 N813B
Gives rural property loss by fire for the year ending June 30, 1946 and for the period July 1-Dec. 21, 1946. Faulty heating systems caused 37 percent of the past year's fires.

Personal Risks

Accidents and Sickness

326. BAKER, J. N. A study of deaths from farm accidents in Alabama. Amer. J. Pub. Health 30(1): 22-34. Ref. Jan. 1940. 449.9 Am3J
Address before the Health Officers Section of the American Public Health Association, Pittsburgh, Pa., Oct. 19, 1939.
Farm accidental deaths in Alabama, 1932-38, are analyzed as to home and industrial, month of occurrence, color and sex, and agency of injury.
Abs. in Monthly Labor Rev. 51: 109-111. July 1940. 158.6 B87M

327. BAKER, R. H., and FALCONER, J. I. Accidents that were fatal on Ohio farms or to farm people, 1945. Ohio. Agr. Col. Dept. Rural Econ. and Rural Sociol. Mimeog. B. 191, 9 p. Apr. 1946. 281.9 Oh32
Statistics are analyzed as to time, place, age, sex, and cause. The total number of fatal accidents was 174.

328. DODD, P. A., and PENROSE, E. F. Economic aspects of medical services; with special reference to conditions in California. Washington, Graphic Arts Press, 1939. 499 p. Ref. Libr. Cong.
Ch. 4, Reported need, diagnosis, and treatment. Communities with populations of 5000 or less are included but farm families are not reported separately. Includes discussion and statistics of need for medical and dental care.

329. DORN, H. F. The relative amount of ill-health in rural and urban communities. Pub. Health Rpts. 53: 1181-1195. July 15, 1938. 151.65 P96
Based on data for 47,575 individuals observed for 12 months each. They resided in 130 localities scattered throughout the United States. Tables give number of cases of illness per 1,000 person-years by sex and size of community, including rural (open country).

330. DORN, H. F. Rural health and public health programs. Rural Sociol. 7: 22-32. Mar. 1942. 281.28 R88
Table 1 gives number of deaths per 1000 population in rural and urban communities and the percentage decrease in the death rates, 1900-02 to 1939.

331. DUBLIN, L. I., and VANE, R. J., JR. Causes of death by occupation; occupational mortality experience of the Metropolitan Life Insurance Company, Industrial

Accidents and Sickness--Continued.

Department, 1922-1924. U. S. Bur. Labor Statis. B. 507, 130 p. Feb. 1930. 158.6 B87

Farmers and Farm Laborers, p. 39-42. Death rates are 29 to 47 percent below the average.

332. FALK, I. S., KLEM, M. C., and SINAI, N. The incidence of illness and the receipt and costs of medical care among representative families; experiences in twelve consecutive months during 1928-1931. Chicago, U. Chicago Press, 1933. 327 p. (Com. on the Costs of Med. Care P. 26) Libr. Cong.

Towns under 5000 population and rural areas are included in one group by income classes. Incidence and other data are analyzed in detail, but farm families are not specified and costs receive the most attention.

333. FARM accidents in Canada and United States. Labour Gaz. 47: 1887-1889. Dec. 1947. 283.8 C16L

Results of a sample survey to determine the frequency of non-fatal accidents and fires on farms in Canada, conducted by the Dominion Bureau of Statistics for the year ending June 1, 1947. The data are analyzed as to regional distribution, age distribution, and cause. Results of the sample survey conducted by the U. S. Bureau of Agricultural Economics are given for comparison.

334. FARM accidents in Wisconsin 1944. Wis. Crop and Livestock Rptr. 24: 63-64. Aug. 1945. 2 W755

Results of a survey of crop reporters' farms in Wisconsin indicate that about one of every nine full-time operated farms in the State had an accident from farming operations. Table gives number of injuries by types and causes compared with types of injuries in industry.

335. FERRIS, G. E., and FALCONER, J. I. Farm accidents in Ohio: Their nature, causes, and costs. Ohio. State U. Dept. Rural Econ. Mimeog. B. 166, 12 p. May 1943. 281.9 Oh32

Vocational agriculture high school students in Ohio reported 395 accidents on 4,976 farms during the year ended February 1943. Causes were reported as follows: Machinery, 22 percent; falls, 18.5 percent; animals, 13.5 percent; hand tools, 11 percent; falling or flying objects, nearly 8 percent; stepping on injurious objects, 5 percent; motor vehicle traffic, 4.3 percent; miscellaneous, about 18 percent.

336. FIREMAN'S FUND INDEMNITY COMPANY. Safety and engineering division Pacific coast agricultural accidents; types, causes and means of prevention. San Francisco, Calif., 193? 16 p. 449.15 F51

Chart shows percentage of agricultural accidents caused by falls of persons, hand handling objects, farm animals, farm machinery, hand tools, and other types, on the Pacific Coast compared to the same types of industrial accidents and to Kansas farm fatalities.

337. HARTWIG, L. H. Saving farm manpower. Nation's Agr. 18(7): 6, 11. July/Aug. 1943. 280.82 B89

Farm accidental deaths average .54 persons per 1,000 employed.

338. HOLLINGSWORTH, H., and others. Family expenditures for medical care. U. S. D. A. Misc. P. 402, 241 p. 1941. 1 Ag84M

D. Monroe, M. C. Klem, and K. L. Benson, joint authors.

Includes tables showing percentage of money income taken by medical care expenditures and average expenditures for health and accident insurance in a Pennsylvania-Ohio farm area.

339. HOLLINGSWORTH, H., KLEM, M. C., and BANEY, A. M. Medical care and costs in relation to family income; a statistical source book. U. S. Social Security Admin. Bur. Res. and Statis. Bur. Memo. 51, ed. 2, 349 p. May 1947. 173.2 So1Bu

Costs of medical care are tabulated for "rural farm families" and for "towns of less than 5,000 and rural areas."

The first edition (1943) also gives number of illnesses per 1000 persons in rural families.

340. HURD, T. N. Farm accidents and insurance, township of Groton, Tompkins County, New York, 1945-46. N. Y. Agr. Col. A. E. 581, 38 p. Jan. 1947. 281.9 C81

During the year ended Aug. 31, 1946, on the 126 farms surveyed 42 accidents occurred to members of the farm families and their hired workers. Analysis of these accidents includes number of days of disability, cost of medical care, total cost of accidents, and average cost per accident and per farm.

Summary in N. Y. Agr. Col. Farm Econ. 157: 4067-4068. Oct. 1947. 280.8 C812

Accidents and Sickness--Continued.

341. KANSAS. FARM ACCIDENT COMMITTEE. A farm safety primer with rules governing county and state safety contests, presenting a program for farm safety in Kansas. Topeka, Kans. State Printing Plant, 1940. 35 p. 449.15 K13

"Prepared by the Farm Accident Committee, State Safety Council" (p. 2).

The number of farm accidents caused by machinery, livestock, falls, wood-cutting, falling objects, infections, explosions, children at play and gunshot is given for Kansas and for the United States (p. 6).

342. KANSAS. STATE BD. OF AGRICULTURE. Farm accidents in Kansas. A report...on the first statewide survey of farm accidents in the United States. Kans Kans. State Bd. Agr. Biennial Rpt. (1935-1936) 30: 15-31. 1937. 2 K13R

Results of a survey by assessors in 1935 are analyzed. Causes of accidents are given as machinery, 33 percent; horses, 23 percent; automobiles and trucks, 6 percent; cattle, 2 percent; falls of various kinds, 2 percent; cause not reported, 34 percent.

343. KANSAS. STATE BD. OF HEALTH. Kansas accidental death report. Topeka, 1948. 64 p. U. S. Dept. Labor Libr.

Gives figures for 1947, including farm accidents. Issued annually.

344. KANSAS. STATE BD. OF HEALTH. Provisional report of Kansas 1947 agricultural deaths. Topeka? 1948? 9 p. 449.9 K213

Tables show accidental deaths by cause, 1933-47; percentage each is of total, 1947; accidental deaths by age group and by county of occurrence, 1947; and detailed analyses of the general causes.

345. KAUFMAN, H. F., and MORSE, W. W. Illness in rural Missouri. Mo. Agr. Expt. Sta. Res. B. 391, 55 p. Aug. 1945. 100 M693

Based on a survey of five counties, 1939-42. During the survey year, 44 percent of all persons were ill one or more days. The rate of illness for farm operators was 67,800 days yearly per 1000 operators. The statistics are analyzed.

346. KOSSORIS, M. D. Industrial injuries in the United States during 1941. Monthly Labor Rev. 55: 501-527. Sept. 1942. 158.6 B87M

Table 1 includes number of injuries in agriculture divided as to those resulting in death or permanent total disability, permanent partial disability, and temporary total disability. It is noted that the figures are based on fragmentary data.

347. LIVELY, C. E. Rural health and medical service in Missouri; a special report. Columbia, U. of Mo., 1942. 22 p. 449.15 M69

As a result of a field survey of 1521 families in five counties it is reported that the rate of illness is 445 in every 1000 persons.

348. MACDONALD, C. R. Statistical report, 1941-1942. Calif. Safety News 27(3): 2. Sept. 1943. U. S. Dept. Labor Libr.

Injuries reported to the Industrial Accident Commission of California totaled 131,615 of which 12,513 were in agriculture. Statistics are tabulated by main industrial divisions, main cause groups, and extent of disability.

349. MEDICAL care for farm workers in California and Arizona. Monthly Labor Rev. 55: 957-9. Nov. 1942. 158.6 B87M

Among members of the Agricultural Workers Health and Medical Association, average sickness rate in the two States from July 1939 to June 1941 ranged from 6.4 per 100 members in September 1939 to 13.1 in January 1941.

350. METROPOLITAN LIFE INSURANCE COMPANY. Rural versus urban longevity. Metrop. Life Ins. Co. Statis. B. 16(7): 1-4. July 1935. Libr. Cong.

Table 1 gives expectation of life and mortality rates per 1,000, by age groups, for rural and urban white males and females, 1901, 1910, and 1930. At birth a rural white male has an expectation of life of 62.09 years compared with 56.73 for the urban male.

351. MOTT, F. D., and ROEMER, M. I. Rural health and medical care. New York, McGraw-Hill, 1948. 608 p. Ref. 448 M853

Ch. 4, Deaths and their causes; Ch. 5, The burden of sickness. These chapters include discussions of life expectancy and mortality trends, the principal causes of death, frequency of illnesses in each age group, and incidence and types of illnesses.

Accidents and Sickness--Continued.

352. NATIONAL HOME AND FARM SAFETY CONFERENCE. Transactions; first...Chicago, February 17-18, 1942. Chicago, National Safety Council, 154 p. 1942. 449.9 N2123

Partial contents: Farm accidents--where and how they occur, by H. M. Pontious, p. 36-38; Engineering aspects of farm safety, by J. B. Davidson, p. 38-44, including a table showing the relation of farm accidents to farm machines compiled from a survey by the Illinois Agricultural Association in 1938 and 1939.

353. NATIONAL SAFETY COUNCIL. Accident facts, 1948 ed. Chicago, 1948. 96 p. 289.69 N21

Farm and farm home accidents (p. 86-90).

Issued annually.

354. NATIONAL SAFETY COUNCIL. Organizing for farm safety; a co-operative national program for the prevention of accidents among farm people of the United States. [Chicago, 1940] 13 p. Ref. 449.15 N21

Table 1 lists fatal farm accidents in Kansas, 1930-38, by type, number, and percent; Table 2, lists them for Minnesota, 1939; and Table 3 compares rural and urban accident types in New York State.

355. NEW JERSEY DEPT. OF LABOR. Industrial accident report...compensable cases closed during year ending December 31, 1947. Trenton, 1948. 11 p. U. S. Dept. Labor Libr.

Includes agriculture.

Issued annually.

356. OHIO INDUSTRIAL COMMISSION. 1946 annual statistical report. Columbus, 1947. 27 p. 449.9 Oh3

Agriculture is one of the industries covered. Total accident figures are given for 1937-46. Statistics for 1946 are analyzed as to cause and degree of injury.

357. PENNOCK, J. L., and ANGLE, G. M. What farm families spend for medical care. U. S. D. A. Misc. P. 561, 18 p. 1945. 1 Ag84M

Charts show share medical care takes of living expenses and income, and types of care.

358. POWERS, J. H. Emergency surgery in a rural hospital: Traumatic emergencies. Conf. on Rural Med. Proc. 1938: 51-63. 1939. 448.9 C7643

Contains analyses of farm accidents as to location (barn, etc.), frequency by months, age and sex, and period of hospitalization. Data are from records of the Mary Imogene Bassett Hospital, Cooperstown, N. Y.

359. PRICE, D. J., and ROETHE, H. E. Farm accidents take a heavy toll. U. S. Bur. Agr. Chem. and Engin. ACE-49, 4 p. 1940? 1.932 A2Ag8

Statistics show deaths from accidents in Alabama by motivating activity and agency of injury, and deaths and injuries from accidents in Illinois by injuring factor.

360. SARLE, C. S., and KOEPPER, J. M. The nation-wide farm accident survey. Farm Safety Rev. 5(4): 7-9. July/Aug. 1947. 449.8 F22

A survey of 15,000 farms in 814 counties, made in January 1947, showed one person injured for every 28 farms, a total of 633 accidents during the quarter October-December, 1946. Statistics are analyzed as to type of activity, sex of injured, geographic area, and place of accident (farm, home, road or street, and elsewhere).

Also issued by the U. S. Bur. Agr. Econ. 1.941 R9P91

361. SHOEMAKER, W. Carelessness is costly. Everybodys Poultry Mag. 52(1): 7, 28-30. Jan. 1947. 47.8 F213P

In 1945 about 16,000 farm deaths resulted from accidents. The death rate was 53 persons per 100,000 compared with a rate of 31 in industry. Fire took 3500 lives on farms in 1946 and destroyed $200,000,000 of property.

362. SORENSEN, R. 837 Iowa farm accidents, Farm Bureau survey reveals. Iowa Bur. Farmer 8(6): 6, 12. June 1944. 275.293 Iowa

The survey covered the eight months, Sept. 1, 1943 to May 1, 1944, and reported the following accidents: 168 falls, 160 accidents with corn pickers, 139 with miscellaneous farm machinery, 100 with tractors, 81 persons injured by horses and mules, 17 by bulls, 22 by cattle other than bulls, 33 by burns and explosions, 10 by firearms accidentally discharged, 19 by small tools or equipment, 3 by lightning, 1 from suffocation, and 80 from miscellaneous causes.

363. U. S. BUR. OF AGRICULTURAL ECONOMICS. Accidents to farm people and farm workers, January-April 1948. Washington, 1948. 10 p. 1.941 R9Ac2

This survey is the second in a series designed to cover all seasons of the year for the entire Nation.

Accidents and Sickness--Continued.

364. U. S. BUR. OF AGRICULTURAL ECONOMICS. Analysis of a limited number of fatal accidents to farm and rural people in South Carolina, by J. D. Rush. Washington, 1945. 8 p. 1.941 H22An12

Causes of accidents were: automobiles, 27 percent; firearms, 13 percent; burns, 10 percent; drowning, 10 percent; livestock, 6 percent; falls, 5 percent; trucks, 4 percent; trains, 4 percent; falling trees, logs, 3 percent; lightning, 2 percent. The 267 accidents are also analyzed according to age groups, race, sex, and months of occurrence.

365. U. S. BUR. OF AGRICULTURAL ECONOMICS. Analysis of 7,851 fatal farm-work accidents in the United States, 1940-43, by J. D. Rush, Washington, 1945. 9 p. 1.941 H22An1

Statistics from State public health departments for 1940-43 are analyzed as to cause of accident (machinery, livestock, miscellaneous) and by geographic division, age, sex, race, and month.

366. U. S. BUR. OF AGRICULTURAL ECONOMICS. Cass County rural health service, Cass County, Texas, 1942-44, by T. W. Longmore and T. L. Vaughan. Little Rock, Ark., 1945. 117 p. 1.941 R7C27

Includes rates on the incidence of specified diseases among 91 rural families (p. 38).

367. U. S. BUR. OF AGRICULTURAL ECONOMICS. Preliminary report on survey of farm accidents. Washington? 1947. 4 p. 1.941 R9P91

"The survey, made in January, 1947, included about 15,000 farms in 814 counties. The method of selection was designed to obtain figures representative of the entire Nation. Although subject to later revision, the figures thus obtained are the most complete yet available on farm accidents" (p. 1).

368. U. S. BUR. OF AGRICULTURAL ECONOMICS. The prevention of accidents on farms and in homes. Washington, 1942. 49 p. 1.941 R9P92

Temporary injuries are classified by periods of time lost, p. 10. Farm accident statistics are discussed separately for each of 30 States.

369. U. S. FARM SECURITY ADMIN. Status of farm labor under State workmen's compensation laws, by S. Liss. Washington, 1939. 12 p. 1.95 L11St

Summarizes reports of farm, compared to industrial, accidents in Ohio, Massachusetts, and Kansas.

370. WHISNANT, M. N., and MAJORS, E. Safety in the home. Ala. Polytech. Inst. Agr. Ext. C. 273, 8 p. Mar. 1944. 275.29AL1C

Accidental deaths on Alabama farms, 1933-38, totaled 309 from farm work and 1594 in homes. Causes are discussed.

371. WILLSEY, F. R. Wayne County counts the cost. Farm Safety Rev. 5(4): 10-12. July/Aug. 1947. 449.8 F22

A survey of accidents in Wayne County, Ind. in 1946 reported 4 deaths in a total of 408 accidents. Charts show causes and months of accidents.

372. WILSON, I. C. Sickness and medical care among the Negro population in a delta area of Arkansas. Ark. Agr. Expt. Sta. B. 372, 36 p. Mar. 1939. 100 Ar42

Town and country are compared in tables 16 and 17 giving estimate of amount of illness and incidence of specified diseases. Tables 22 and 23 give estimates of amount of illness and incidence of specified diseases by occupation; owners, tenants, croppers, domestics, pensioners, laborers, and others.

373. WILSON, I. C., and METZLER, W. H. Sickness and medical care in an Ozark area in Arkansas. Ark. Agr. Expt. Sta. B. 353, 39 p. Apr. 1938. 100 Ar42

Report includes frequency and duration of illnesses in the Hindsville community, Madison County, Ark., May-Sept. 1936. Deaths during the preceding 5-year period are also reported.

374. YOUNG, H. H. Hospitalized through farm accidents. Farm Safety Rev. 4(6): 3-5. Nov.-Dec. 1946. 449.8 F22

Condensed from talk at the 34th National Safety Congress.

In the 9 years, 1935-43, 575 accidents on the farm caused the person injured to come to the Mayo Clinic, Rochester, Minn. Distribution of accidents is shown by cause, age, and nature of injury.

RISK IN RELATION TO FARM ORGANIZATION AND MANAGEMENT

General

375. ASCH, B., and MANGUS, A. R. Farmers on relief and rehabilitation. U. S. Works Prog. Admin. Res. Monog. 8, 226 p. 1937. 173.2 W89Re

The following hazards of American agrarian life are briefly discussed: Farming on poor land; excess birth rate; soil erosion; inadequate size of farms; extension of the one-cash-crop system; overcapitalization of farms; decline of rural industries; the tenant system; and the farm laborer problem.

376. BENEDICT, M. R. The opportunity cost basis of the substitution method in farm management. J. Farm Econ. 14: 384-405, 541-557. Ref. July-Oct. 1932. 280.8 J822

One factor involved is the "increased risk of loss owing to concentration of risk" (p. 391).

Also issued as Papers 31 and 32 of the Giannini Foundation of Agricultural Economics. 281.9 G34

377. BENGTSON, B. Why some fail at farming. Your Farm 2(12): 17-20. Oct. 1944. 6 Y8

Describes some causes of farm losses.

378. BONDURANT, J. H., and THARP, M. M. Variations in farm income and family living in Robertson County. Ky. Agr. Expt. Sta. B. 405: 305-331. June 1940. 100 K41

Excessive rainfall during 1935 caused low yields of all harvested crops except hay. For the seven months, March through September, the rainfall was 41.7 inches compared with a normal of 26.28 inches. In 1937 it was 20.64 inches. An examination of farms that had relatively good yields in these seasons revealed that the systems of farming followed were better balanced than others.

379. BONNEN, C. A., THIBODEAUX, H., and CRISWELL, J. F. An economic study of farm organization in the Piney Woods farming area of Texas. Tex. Agr. Expt. Sta. B. 453, 51 p. Sept. 1932. 100 T31S

Tables show financial and physical organization and income of 9 farms. Diversified farm organization is recommended to lessen the risk of extreme variations in farm income due to variations in yields and prices of cotton.

380. COLE, J. S., and MORGAN, G. W. Implements and methods of tillage to control soil blowing on the northern Great Plains. U. S. D. A. Farmers' B. 1797, 20 p. Jan. 1938. 1 Ag84F

381. EDWARDS, A. D. Influence of drought and depression on a rural community; a case study in Haskell County, Kansas. U. S. Farm Security Admin. Soc. Res. Rpt. 7, 116 p. Ref. p. 112-115. Jan. 1939. 1.95 So1

Adaptation of farming to climate (p. 29-30, 36, 51-54).

382. FINNELL, H. H. Adjustment problems in wheat production. Okla. Agr. Expt. Sta. Panhandle B. 54: 3-13. June 1934. 100 Ok42

Experiments at the Panhandle Agricultural Experiment Station resulted in best returns from the variable method, i. e. wheat planted only when conditions appeared favorable for average or better yield.

383. GOODSELL, W. D. Farm adjustments and income on typical Corn Belt farms. U. S. D. A. C. 688, 59 p. Nov. 1943. 1 Ag84C

Based on a 33-year record of farm adjustments and income on typical farms, through war and peace, good years and bad. Includes procedure and methodology.

384. HAUTER, L. H., WALKER, A. L., and WELLS, O. V. Selecting the most profitable system of dry-land farming in eastern New Mexico. N. Mex. Agr. Expt. Sta. B. 188, 41 p. 1931. 100 N465

"The specialized wheat system of farming involves the greatest risk and the returns are the least regular of the systems discussed" (p. 34).

385. HENDRIX, W. E., FULLILOVE, W. T., and SAYRE, C. R. Organizing and operating Bullock County farms to meet war needs. Ga. Agr. Expt. Sta. B. 227, 55 p. Oct. 1943. 100 G29S

Mentions hazards of boll-weevil infestation in cotton and of changes in price and supply of purchased feed for livestock.

386. IOWA AGRICULTURAL EXPERIMENT STATION. AGRICULTURAL ECONOMICS SECT. Trial and error in farm management, by A. Mighell. Ames, Iowa State College, 1938. 48 p. 281.027 Io922

Defines risk, p. iii. Includes case studies illustrating the planning of farm work and of the use of resources to reduce risk or loss.

RISK IN RELATION TO FARM ORGANIZATION AND MANAGEMENT--CONTINUED.

387. JARVIS, T. D. Coincidence as major factor in agriculture. Sci. Agr. 11: 760-774. July 1931. 7 Sci2

Considers the "coincidence" of interacting factors "which will produce maximum yields in individual crops and varieties at reasonable profits considering tillage, conservation of fertility, control of diseases and insects, etc."

388. JOHNSON, N. W. Farm adjustments in Montana; a study of area VII, its past, present and future. Mont. Agr. Expt. Sta. B. 367, 59 p. Mar. 1939. 100 M76B

Farm adjustments for greater "stability" are briefly discussed (p. 32-44).

389. KIFER, R. S., CHRISTOPHERSEN, P., JOHNSON, S. E. Emergency farm adjustments in the wheat area of South Dakota. S. Dak. Agr. Expt. Sta. C. 8, 25 p. Jan. 1933. 100 So82

Discusses briefly the effort of some farmers in the spring-wheat area of South Dakota to reduce their expenses or shift their production so that their income will equal their expenses. These adjustments were made necessary by three years of low farm prices, accompanied by a year of crop failure.

390. KRAENZEL, C. F. New frontiers of the Great Plains; a cultural approach to the study of man-land problems. J. Farm Econ. 24: 571-588. Aug. 1942. 280.8 J822

"It is readily apparent that many culture traits and patterns, imported from more humid parts of the nation, were ill-adapted to the semi-arid conditions of the Great Plains physical environment. Rehabilitation of people in the region will require changes in the existing culture in order to adapt it more effectively to the limitations imposed by the physical environment. Area diversification in farming is likely to be an adapted practice" (p. 588).

391. MEYERS, K. H. Adjusting Corn Belt farming to meet corn-borer conditions. U. S. D. A. Farmers' B. 1681, 26 p. Feb. 1932. 1 Ag84F

392. NELSON, P., and WILSON, W. Farm income and stability of farm plans. Current Farm Econ. [Okla. Sta.] 14: 102-104. Aug. 1941. 100 Ok4

Table 1, High and low variability of wheat acreage and numbers of livestock as related to profitability of farming, Garfield County, Oklahoma (1931-38).

393. NODLAND, T. R., and POND, G. A. Summary report of the Southeastern Minnesota Farm Management Service, 1940-1942. Minn. U. Div. Agr. Econ. Mimeog. Rpt. 141, 28 p. Oct. 1943. 281.9 M66

Tables of expenses include cost of insurance.

Causes of deviations from average incomes are discussed.

394. NODLAND, T. R., and POND, G. A. Summary report of the Southwestern Minnesota Farm Management Service, 1940-1942. Minn. U. Div. Agr. Econ. Mimeog. Rpt. 142, 32 p. Nov. 1943. 281.9 M66

Tables of expenses include cost of insurance.

"Of the 18 farmers whose earnings ranked in the upper 20 per cent for the three-year period, six failed to achieve that ranking in 1940. Three of these six men experienced heavy livestock losses in the November 11 storm and one had low yields of small grain because of rain damage to grain in shocks. Six of these 18 farmers failed to place in the top one-fifth in 1941. Four of these six suffered up to 85 percent hail loss on crops. Three of these farmers failed to place in the top one-fifth in 1942. Two of the three farmers had severe crop losses because of unfavorable weather conditions" (p. 9).

395. NORTHERN GREAT PLAINS ADVISORY COUNCIL. Report, Apr. 24, 1939-Aug. 9, 1945. 282.9 N817

Some issues are reports of the joint meetings of the Northern and Southern Great Plains Agricultural Advisory Councils.

While current problems discussed were not directly related to risk, background information on problems of the Great Plains was presented.

See also Regional Agricultural Council for the Southern Great Plains States (item 399).

396. NORTHERN GREAT PLAINS AGRICULTURAL ADVISORY COUNCIL. RESEARCH SUBCOMMITTEE. Preliminary report...February 1940. 115 p. 282.9 N8172

Lists established principles, and facts and research needed in regard to soil moisture and its control, irrigation and drainage, farm equipment, crops and cropping

RISK IN RELATION TO FARM ORGANIZATION AND MANAGEMENT--CONTINUED.

practices, ranges and pastures and their management, weed problems, vegetable gardening, fruit growing, plant pathology, cattle and sheep, dairying, swine, poultry, plant and animal insects, animal diseases, land utilization and tenure, agricultural credit, and prices.

397. POND, G. A., and RANNEY, W. P. The dairy farmer's response to changes in natural and economic conditions. Minn. U. Divs. Agr. Econ. and Agr. Ext. Farm Business Notes 185: 1-3. May 20, 1938. 275.29 M663

Tables give average cash receipts, expenses and net cash income per 100 acres, prices of principal sale products, numbers of livestock, and production of butterfat, hogs, and eggs per 100 acres, and average percentage of tillable crop land in alfalfa and in sweetclover pasture, 1928/29-1936/37. The relative stability and inflexibility of the dairy farm organization is mentioned.

398. POND, G. A., RANNEY, W. P., and CRICKMAN, C. W. Factors causing variations in earnings among dairy farmers in southeastern Minnesota. Minn. Agr. Expt. Sta. B. 314, 83 p. Dec. 1934. 100 M66

Study, based on 766 farm year account records for the years 1928 to 1932, inclusive, shows individual and cumulative effects of each of eight organization and management factors on earnings. The factors were size of business; choice of crops; amount of livestock per 100 acres; crop yields; butterfat production per cow; returns over feed from livestock other than cows; labor efficiency; and power, machinery and improvement expense per productive man work unit.

399. REGIONAL AGRICULTURAL COUNCIL FOR THE SOUTHERN GREAT PLAINS STATES. Report of the...conference, Dec. 1935-Jan. 1948. 282.9 R26

Some issues are report of the joint conferences of the Southern and Northern Great Plains councils.

While current problems discussed were not directly related to risk, background information on problems of the Great Plains was presented.

See also Northern Great Plains Advisory Council (item 395).

400. REITZ, L. P. Crop regions in Montana as related to environmental factors. Mont. Agr. Expt. Sta. B. 340, 84 p. Ref. May 1937. 100 M76B

Discusses climatic factors (including precipitation cycles, length of frost-free period, storm paths, wind, snow cover, and hours of sunshine) and choice of crops as related to these factors.

401. STARCH, E. A. Type of farming modifications needed in the Great Plains. J. Farm Econ. 21: 114-120. Feb. 1939. 280.8 J822

Plans for adjusting quickly to changes in available moisture.

Discussion by E. C. Johnson, p. 120-122.

402. STEPHENS, P. H. A farm management point of view on FCA loans and loan experience. Southwest. Social Sci. Q. 19: 161-170. Sept. 1938. 280.8 So82

Foreclosures occurred in southeast Oklahoma when cotton production there declined because of the combination of boll weevil, soil depletion, and the competition of other areas, and the land was returned to a less intensive use; in semi-arid areas and regions far from markets when farms were consolidated into ranches; in an irrigation district where the source of water proved inadequate.

403. TENNANT, J. L. Adjusting farm management to changing economic situations. R. I. Agr. Expt. Sta. B. 274, 35 p. Aug. 1939. 100 R34S

Table 4 gives yields and index number of yields of corn, hay and potatoes, by decades, 1866-1935, and by years, 1891-1939. Organization and management records of 43 dairy farms and 40 poultry farms are analyzed.

404. THIBODEAUX, B. H., BONNEN, C. A., and MAGEE, A. C. An economic study of farm organization and operation in the high plains cotton area of Texas. Tex. Agr. Expt. Sta. B. 568, 75 p. Jan. 1939. 100 T31S

Rainfall from September through August was 25 percent below normal for six of the years 1912-36 and cotton yields at the Lubbock experiment substation were 55 percent below average during these years of low rainfall. The crop was a complete failure in two of these years. Damage from hail, wind and insects is mentioned, p. 10-12. Causes of variations in earnings on 127-141 farms, 1931-35, are also discussed.

405. TREBRA, R. L. VON, and WAGNER, F. A. Tillage practices for southwestern Kansas. Kans. Agr. Expt. Sta. B. 262, 17 p. Nov. 1932. 100 K13S

"Fallow has increased the average yield of kafir 77 to 92 percent, milo 75 percent, sorgo forage 77 percent and wheat 87 percent, over the best method of continuous cropping. Fallow stabilizes farm incomes by making possible the production of a crop in dry years when crops fail on continuously cropped land" (p. 3).

406. U. S. BUR. OF AGRICULTURAL ECONOMICS. Forces causing dairy farmers to make changes in their farm organizations in Barron County, Wisconsin, by R. P. Christensen. Washington, 1939. 70 p. 1.941 L6F74

Forces mentioned are: droughts of 1934 and 1936; diseases affecting potatoes; and declining soil fertility. Milk production decreased in 1934 due to crop failure caused by the drought.

407. U. S. BUR. OF RECLAMATION. Types of farming. Columbia Basin joint investigations. Problem 2. Washington, 1945. 320 p. 156.84 C72

Contains an analysis of types of farm units as to their suitability for the area. In arriving at normal yields of forage crops, grains, field crops, fruits, and vegetables suitable for the area, factors affecting yields are considered. Estimates of livestock production include death losses.

408. WALSTER, H. L. Planning in the Great Plains. N. Dak. Agr. Expt. Sta. Bimonthly B. 5(6): 7-15. July 1943. 100 N813B

Address before the American Planning and Civic Association, Omaha, Nebr., June 15, 1943.

Reviews problems encountered in the development of the Great Plains.

409. WEBB, W. P. The Great Plains. Boston, Houghton, Mifflin, 1936. 525 p. Ref. 135 W38

History and development of the Great Plains, including discussions of the adaptation of farming practices and of land and water laws to meet the needs of a semi-arid region.

An appraisal by F. A. Shannon (Social Sci. Res. Council B. 46, 254 p. 1940. 281.29 So1) is criticized by J. W. Caughey (Miss. Valley Hist. Rev. 27: 442-444. Dec. 1940. 134.8 M69).

410. WILCOX, W. W., and LLOYD, O. G. The human factor in the management of Indiana farms. Ind. Agr. Expt. Sta. B. 369, 23 p. Aug. 1932. 100 In2P

Factors found to be associated with variations in income were: (1) wife's interest and help, (2) ambition to make economic progress, (3) knowledge of technical agriculture, (4) interest in farming, and (5) quality of farm.

411. WILCOX, W. W., BOSS, A., and POND, G. A. Relation of variations in the human factor to financial returns in farming. Minn. Agr. Expt. Sta. B. 288, 65 p. June 1932. 100 M66

Human factors showing a direct relation to financial returns were age of operator, intelligence, interest, and ambition.

Credit

412. ACKERMAN, J., and NORTON, L. J. Factors affecting success of farm loans; a study of lending experience in seven counties in east-central Illinois, 1917-1933. Ill. Agr. Expt. Sta. B. 468: 458-527. Aug. 1940. 100 IL6S

Factors discussed are: quality of soil, time when loans were made, loan ratio, topography, transportation facilities, farm organization, and personal qualities of the borrower. Causes given for foreclosures include death (14 foreclosures) and poor health (6 foreclosures).

413. BELSHAW, H. The provision of credit with special reference to agriculture...With two chapters upon the provision of rural credit in England, by R. R. Enfield. Cambridge, Heffer, 1931. 326 p. (Auckland U. Col. texts 1). 284.2 B41

Contains a brief discussion of risk with reference to the providing of agricultural credit.

414. DOANE AGRICULTURAL SERVICE. Iowa as farm loan territory; an investigation and report to Aetna Life Insurance Co., Hartford, Connecticut. St. Louis, Mo., 1935. 153 p. 281.027 D65

Ch. 9, Hazards. Maps show number of hazards regularly affecting each county, losses from frost damage to corn, tornado damage, hail damage, distribution of objectionable weeds, and damage from chinch bugs, grasshoppers, hessian fly, armyworm, white grub, and rodents.

415. DOANE AGRICULTURAL SERVICE. Minnesota as farm loan territory. An investigation and report to Aetna Life Insurance Co., Hartford, Conn. St. Louis, Mo., 1937. 148 p. 281.043 D65

Credit--Continued.

Ch. 9, Hazards. Discusses weather, tornadoes, noxious weeds, grasshoppers, armyworm, and white grub, and mentions losses from wheat stem maggot, black stem rust, wheat scab, and smut. Maps show number of serious hazards affecting a county, path and direction of tornadoes, distribution of noxious weeds, and areas of infestation of grasshoppers, armyworm and white grub.

416. ECKERT, P. S., and MAUGHAN, O. H. Farm mortgage loan experience in central Montana; a study of the important factors associated with good or bad mortgage loan experience. Mont. Agr. Expt. Sta. B. 372, 39 p. June 1939. 100 M76B

Table 12 gives relation of wheat yields to percentage of loans foreclosed, based on loans made on wheat farms, 1911-32; and wheat yields, 1928-32. Relation of foreclosures to land classification and productivity is also discussed.

417. GREEN, R. M. Farm mortgage delinquencies and foreclosures. J. Farm Econ. 15: 14-26. Jan. 1933. 280.8 J822

Mentions physical causes of delinquencies, 1920-30, in the following regions: Northwestern dry wheat area; Georgia and South Carolina; eastern Oklahoma; southern Indiana and southern Illinois; western Kentucky; the sugar district of Louisiana; the Red River Valley; northeastern South Dakota; northern Missouri and southern Iowa; southeast Missouri and the Delta country of Mississippi and Arkansas; and north-central Nebraska.

418. HILL, F. F. Research developments in farm finance. J. Farm Econ. 28: 114-125. Feb. 1946. 280.8 J822

Among the problems upon which the author believes additional research is needed, the problem of risk in financing agriculture is mentioned. The National Bureau of Economic Research has a program providing for fundamental research in five general areas, one of which is "Costs, Risks, and Returns in Agricultural Finance."

419. HINMAN, E. H., and RANKIN, J. O. Farm mortgage history of eleven southeastern Nebraska townships, 1870-1932. Nebr. Agr. Expt. Sta. Res. B. 67, 67 p. Aug. 1933. 100 N27

Table 12 gives number and acreage of foreclosures for selected years, 1874-1932.

420. HORTON, D. C., LARSEN, H. C., and WALL, N. J. Farm-mortgage credit facilities in the United States. U. S. D. A. Misc. P. 478, 262 p. 1942. 1 Ag84M

Pt. III, Current Problems and Issues in Farm-Mortgage Credit Policy, includes a general discussion of the relation of risk to the lending practices of the farm-mortgage credit agencies.

421. HORTON, D. C. Insurance aspects of extra-risk mortgage loans. J. Farm Econ. 23: 855-866. Nov. 1941. 280.8 J822

"The application of insurance principles to lending is in a sense a special form of income insurance. The lender by charging a higher interest rate on extra-risk credit builds up a reserve, paid in by those who find themselves able to pay the higher charge, to compensate for the lack of funds available for debt service for other borrowers" (p. 863).

"By providing in advance for a part of the financial hazards of farm ownership, a soundly conceived and operated extra-risk credit program might go far to further the ideal of farm ownership by the operator" (p. 866).

422. HUDSON, S. C. Factors affecting the success of farm mortgage loans in western Canada. Canada. Dept. Agr. Tech. B. 41, 59 p. Apr. 1942. 7 C16T

Based on experience of the Saskatchewan Farm Loan Board, 1917-35. Discusses relation of mortgage foreclosures to climatic and soil zones, types of soil, topography, land class, size and value of farm, variability of wheat yield, distance to market and to community center, year property was acquired, whether occupant was owner or tenant, borrower's financial character, marital status, number in family, nationality, and inspector's experience.

423. JOHNSON, E. C. Farm mortgage foreclosures in Minnesota. Minn. Agr. Expt. Sta. B. 293, 31 p. Dec. 1932. 100 M66

Table 16, Important causes of failure and percentage of farms on which they were mentioned, by districts. For the State as a whole, poor yields was the cause mentioned on 34 percent of the farms, and sickness and death on 23 percent. The relation of land values and productivity to foreclosures is discussed.

Credit--Continued.

424. JOHNSON, S. E., and STEELE, H. A. Some aspects of the farm mortgage situation in South Dakota and their relation to a future land use policy. S. Dak. Agr. Expt. Sta. C. 9, 63 p. Apr. 1933. 100 So82

Table 6 gives number, acreage, and indexes of farm foreclosures, 1913, 1918, and 1921-31, in 44 counties; Table 7, the same in 58 counties. Appendix Table 1 gives number and acreage of foreclosures by counties, 1921-31. Appendix Table 2 gives farm foreclosures instituted in Brookings County, 1881-1932. The mortgage experience of various lending agencies is also discussed.

For later information see C. 17 (item 436).

425. KINSMAN, C. D. Determining farm-mortgage risk. Agr. Finance Rev. 3(2): 34-41. Nov. 1940. 1.9 Ec78Af

Describes a sample farm-mortgage risk-rating system.

426. LUNDY, G. Farm-mortgage experience in South Dakota, 1910-40; with special reference to three townships in each of the counties of Brookings, Clark, Haakon, Hyde, and Turner. S. Dak. Agr. Expt. Sta. B. 370, 32 p. June 1943. 100 So82

Includes dollar volume of foreclosures and acreage involved, by counties for five-year periods.

This bulletin summarizes previous reports for each county, published separately as Circulars 4, 5, 10, 12, and 23 of the South Dakota Agricultural Experiment Station.

427. MERENESS, E. H. Farm mortgage loan experience in southeast Alabama. Ala. Agr. Expt. Sta. B. 242, 18 p. Jan. 1935. 100 AL1S

Includes discussion of relation to foreclosures of soil types, and of appraisers' estimates of average yield of cotton. Based on data for the years 1917-31.

428. MINNESOTA. STATE PLANNING BD. COMMITTEE ON LAND TENURE AND FARM DEBT STRUCTURE. Report. St. Paul, 1937. 126 p. 280.7 M6623

Discussion of trend of farm debt includes foreclosures. Table 29 gives number and value of farm lands foreclosed, by counties, for each year 1925-31.

429. MURRAY, W. G., and BENTLEY, R. C. Agricultural emergency in Iowa. IX, Farm mortgage foreclosures. Iowa Agr. Expt. Sta. C. 147: 159-179. Mar. 1933. 100 Io9

Tables give number of foreclosures by lenders in 15 counties; percentage of total acreage in foreclosure and percentage involved in deficiency judgments by county and by five-year periods.

430. MURRAY, W. G. Agricultural finance; principles and practice of farm credit. Ed. 2. Ames, Iowa State Col. Press, 1947. 372 p. Ref. 284.2 M96

Ch. 6, Natural Hazards, Insurance, and Loan Policy, discusses wheat yields in the "high-risk area" of the Great Plains.

431. MURRAY, W. G. An economic analysis of farm mortgages in Story County, Iowa, 1854-1931. Iowa Agr. Expt. Sta. Res. B. 156: 363-423. Ref. Jan. 1933. 100 Io9

Discusses trend of farm mortgage debt, influence of changes in prices of farm products on foreclosures, sources of mortgage funds, etc. Fig. 7 shows number of foreclosures for each year 1854-1931.

432. MURRAY, W. G. Farm mortgage foreclosures in southern Iowa, 1915-1936. Iowa Agr. Expt. Sta. Res. B. 248: 245-276. Dec. 1938. 100 Io9

Table 1 gives number of foreclosures and acreage foreclosed in 31 southern Iowa counties for each year. Table 6 gives, by districts, average yields of corn by 10-year periods, 1890-1934, and percentage acreage foreclosed, 1915-36. Appendix tables 1 and 2 give number and acreage of foreclosures by counties for each year. Discussion includes price and yield variations and over-valuation of land, in relation to foreclosures.

433. RENNE, R. R. Montana farm bankruptcies; a study of the number, characteristics, and causes of farm bankruptcies over a forty-year period with some suggestions for preventing them in the future. Mont. Agr. Expt. Sta. B. 360, 53 p. June 1938. 100 M76B

Fig. 2 shows number of bankruptcies, 1899-1937. Fig. 15 compares productivity value and amount loaned on different types and grades of land. Fig. 17 gives average yield per acre of wheat, 1899-1937.

434. RENNE, R. R. Montana farm foreclosures; number, characteristics, and causes of farm mortgage foreclosures over a seventy-year period, with some suggestions for reducing them in the future. Mont. Agr. Expt. Sta. B. 368, 58 p. Feb. 1939. 100 M76B

Credit--Continued.

Table 2 gives number of foreclosures by years, 1870-1937.
Review by L. A. Moorhouse, J. Farm Econ. 21: 900-901. Nov. 1939.

435. RENNE, R. R. Montana farm real estate mortgage indebtedness; amount, distribution, characteristics and trend of Montana farm mortgage debt. Mont. Agr. Expt. Sta. B. 383, 40 p. Oct. 1940. 100 M76B
Includes relation of productivity value to amount loaned.

436. STEELE, H. A. Farm mortgage foreclosures in South Dakota, 1921-32. S. Dak. Agr. Expt. Sta. C. 17, 11 p. May 1934. 100 So82
Table 1 gives number, acreage, and indexes of farm foreclosures, 1913, 1918, and 1921-32, in 64 counties. Appendix Table 1 gives number and acreage of foreclosures by acreage and by years, 1921-32.

437. U. S. BUR. OF AGRICULTURAL ECONOMICS. Inter-war credit aids associated with farm ownership and operation, by D. C. Horton. Washington, 1945. 78 p. 1.941 F4In82
Emergency crop and feed loans and drought-relief loans, p. 47-52. "Losses sustained on loans to those farmers whose working capital had been depleted by drought, floods, and other natural disasters often have had the effect of Federal absorption of a part of the risk-bearing costs of farming that are characteristic of areas of high production risk" (p. 48).

438. U. S. FARM CREDIT ADMIN. DIV. OF INFORMATION AND EXTENSION. Agriculture's need for special credit facilities, prepared by J. L. Robinson. Washington, 1938? 14 p. 166.3 Ag82
Discusses relation of uncontrollable natural forces and the biological nature of farming to credit needs.

439. WALL, N. J. Federal seed-loan financing and its relation to agricultural rehabilitation and land use. U. S. D. A. Tech. B. 539, 59 p. Oct. 1936. 1 Ag34Te
Presents a general history and description of Federal seed-loan financing, with discussion of the problems involved. "The problems of wheat growers are likewise different in that greater variations in rainfall involve the problem of equalizing income from year to year so that crop-production expenditures can be repaid each year" (p. 33).

440. WERTZ, V. R. Foreclosures on farm real estate in Putnam, Union, and Greene Counties, Ohio, 1910-1931. Ohio. Agr. Expt. Sta. Bimonthly B. 155: 73-74. Mar./Apr. 1932. 100 Oh3S
Table 1 gives the number of foreclosures annually, 1925-31, and averages for 1910-14, 1915-19, 1920-24, and 1925-29, as well as the amount of land, judgment against the property, amount for which it sold and the difference between judgment and sales.

441. WICKENS, D. L. Farmer bankruptcies, 1898-1935. U. S. D. A. C. 414, 31 p. Sept. 1936. 1 Ag84C
Tables give number of farmer bankruptcies by States and geographic divisions, 1899-1935; farmer bankruptcies compared with those in other occupations; geographic distribution; percentage of total; annual rate per 1000 farms; etc. Discusses relation of bankruptcy to economic conditions, exemptions, average assets and liabilities, provision for debt adjustment, Federal provision for agricultural compositions and extensions, and experience with adjustments.

442. WILCOX, W. W. Capital in agriculture. Q. J. Econ. 58: 49-64. Nov. 1943. 280.8 Q2
"Aversion to debt is more than a desire to avoid risk and uncertainty which might cause severe economic hardships. Farm families that could easily absorb the shock of relatively small losses nevertheless avoid the use of even this amount of credit, because of aversion to going into debt" (p. 60).

Tenure

443. BAUSMAN, R. O. Farm tenancy in Delaware. Del. Agr. Expt. Sta. B. 178, 123 p. Aug. 1932. 100 D37S
Table 14, Pt. 2 (p.64) lists economic reverses experienced by tenants in each of four areas, including death, poor health, losses from fire, and livestock losses.

444. BRANDT, K. Farm tenancy in the United States. Social Res. 4: 133-156. May 1937. 280.8 So19
A general description of the system. "On the side of the landlord the tenancy contract may be interpreted as a risk insurance, guaranteeing a certain stable return, against the hazards of operating the farm" (p. 138).

445. BURDICK, R. T. Landlord and tenant income in

Tenure--Continued.

Colorado. Colo. Agr. Expt. Sta. B. 451, 54 p. Ref. Oct. 1938. 100 C71S
Effect of yield upon net income, p. 20-23.

446. JOHNSON, O. R. Acquiring farm ownership by payments in kind; a plan to permit tenants to buy farms through annual product payments. Mo. Agr. Expt. Sta. B. 378, 12 p. Columbia, 1937. 100 M693
The purchaser assumes the risks of short crops, tax increases, and losses caused by diseases, storms, etc. The seller assumes the risk caused by changes in the price level. Farm value is "frozen" at a determined level of productivity at the time of the sale.

447. JONES, R. W. Production costs as criteria of resource allocation and policy. J. Farm Econ. 30: 443-466. Aug. 1948. 280.8 J822
"Share rental approximates more closely than does any other objective criterion the marginal physical product of land used in producing a particular crop in any area where a significant percentage of the land used in producing that crop is rented on a share basis...We should keep mindful of the shortcomings of contract rent shares, however, ... One arises from the fact that production expenses are not shared between landlords and share tenants in the same proportions as is the net product. This raises the awkward question of the extent to which the associated risks are institutionalized in the rental shares. These differences could result in considerable error of estimate in local areas of severe drought or highly fortuitous weather" (p. 458).

448. SCHULTZ, T. W. What has happened to the agricultural ladder? Iowa Agr. Expt. Sta. B. 357: 301-308. Apr. 1937. 100 Io9
"It is high time that we take aggressive steps (1) to lessen the debt risk inherent in owning and operating an encumbered farm, (2) to improve the landlord-tenant relationships so as to make tenancy a form of farm tenure which will facilitate good farming, rich community life and a stable agriculture. The first demands that the risk of farm mortgage indebtedness be reduced; the second calls for increasing the security of tenure of farm tenants" (p. 308)

Irrigation

449. CALIFORNIA. AGRICULTURAL EXPERIMENT STATION. The Merced irrigation district; an economic survey of farm incomes, expenses and tax-paying abilities, by M. R. Benedict. Berkeley, 1933. 133 p. 281.010 C12
Rules for computation of investment and depreciation of peach orchards, apricots, grapes, almonds, figs, walnuts, prunes, and alfalfa are given, p. 86-87.

450. JOHNSON, S. E. Irrigation policies and programs in the northern Great Plains region. J. Farm Econ. 18: 543-555. Aug. 1936. 280.8 J822
"In the northern Great Plains some irrigation development is needed to provide a winter feed base for surrounding range land. Such irrigation development, combined with a program of gradually shifting the higher risk dry-farming land to grazing uses, will result in a safer and more stable agriculture in the region" (p. 555).

451. LEWIS, M. R. Water conservation and supplementary irrigation in the northern Great Plains. Agr. Engin. 18: 495-496. Nov. 1937. 58.8 Ag83
"It is in the production of forage, particularly alfalfa hay, for the winter feeding of livestock and as a reserve for emergency use in dry years such as 1934 and 1936, that irrigation will be of greatest value" (p. 496).

452. PASCHAL, J. L., and SLAGSVOLD, P. L. Irrigation development and area adjustment in the Great Plains. J. Farm Econ. 25: 433-443. May 1943. 280.8 J822
"Two major factors would assist in bringing about a stable agricultural economy in the plains: 1, Enlargement of currently inadequate units to family size, with the type of agriculture best adapted to the area. 2, The development of a dependable supply of winter feed for livestock through (1) the integrated use of irrigated or good dry land with grazing land and (2) the establishment of adequate feed reserves" (p. 435).

453. RUSSEL, J. C. Drouth and its relation to supplemental irrigation. Agr. Engin. 11: 97-99. Mar. 1930. 58.8 Ag83
Occurrence of drought in Nebraska and correlation of drought with yields of wheat and corn in 20 southern Nebraska counties are discussed.

Irrigation--Continued.

454. SCHELL, H. S. Drought and agriculture in eastern South Dakota in the eighteen nineties. Agr. Hist. 5: 162-180. Oct. 1931. 30.98 Ag8

A general discussion of the effects of drought, and of developments during that time in irrigation and crop diversification.

455. SLAGSVOLD, P. L., and MATHEWS, J. D. Some economic and social aspects of irrigation in Montana. Mont. Agr. Expt. Sta. B. 354, 24 p. Jan. 1938. 100 M76

Discusses crop failures and relative stability of wheat acreage and yields and cattle numbers on dry and irrigated land (p. 6-9).

Irrigation--Continued.

456. U. S. BUR. OF AGRICULTURAL ECONOMICS. From dry-land farming to irrigation (Tri-county area, Nebraska), by N. O. Thompson and R. L. Berger. Lincoln, Nebr., 1946. 46 p. 1.941 L7F92

Problems encountered in shifting to irrigation include nitrogen deficiencies, surface drainage, fitting cropping programs to water-delivery schedules, conflicts in combining irrigation with dryland farming, and the techniques of irrigation (p. 34-38).

457. U. S. BUR. OF RECLAMATION. They subdued the desert. The story of irrigation as told to Barrow Lyons by the men who apply water, till the land and feed their flocks and herds. Washington, 1947. 162 p. 156.85 T34

Individual experiences on irrigated farms.

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