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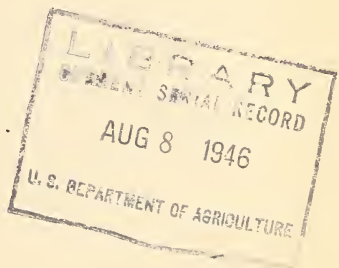
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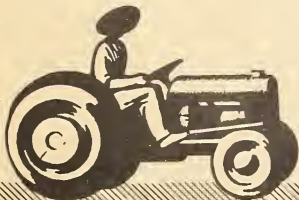
FARM MACHINERY AND EQUIPMENT



by

ERLING HOLE

MATERIALS AND FACILITIES BRANCH
PRODUCTION AND MARKETING ADMINISTRATION



APRIL 1946

WAR RECORDS MONOGRAPH-1

WAR RECORDS MONOGRAPHS

The War Records Project of the United States Department of Agriculture, assigned to the Bureau of Agricultural Economics in 1943, is part of a Government-wide project, initiated by President Roosevelt and coordinated by the Bureau of the Budget, to record the history of the Government's activities in World War II. The objectives of the Departmental project have been to collect, organize and preserve the basic records of wartime administration and to prepare histories of the major war programs. These histories will be issued as War Records Studies.

To supplement the studies of major programs a series of monographs has been planned to present in greater detail the wartime changes in various sectors of agriculture. These supplementary accounts are being issued as War Records Monographs either by the Bureau of Agricultural Economics or by other agencies in this Department.

Below is a list of the War Records Monographs published or in press.

- No. 1 - Farm Machinery and Equipment,
by Erling Hole
- No. 2 - Soil Conservation During the War,
by George W. Collier

April 1946

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FARM MACHINERY AND EQUIPMENT
GOVERNMENT CONTROLS DURING WORLD WAR II

by

Erling Hole, Agricultural Economist

To produce farm machinery requires the same kind of resources as to produce planes, ships, and tanks. With the overwhelming emphasis throughout World War II on sheer quantity of war equipment in order to keep the loss of lives to a minimum, and with farmers' requests for more machinery to produce larger quantities of food and fiber in the face of shortages of farm labor, it was to be expected that farm-machinery production would pose many problems requiring solution by governmental action.

PRODUCTION

Because of the National Defense Program, manufacturers of farm machinery began to have difficulties in obtaining some materials as early as the spring of 1941. At that time production of farm machinery was being greatly expanded. To bring this problem to the attention of Government agencies in Washington, the Farm Equipment Institute, representing manufacturers, appointed a Priorities Committee. The Government agencies that were at that time charged with responsibility in farm-machinery problems were the Office of Agricultural Defense Relations in the U. S. Department of Agriculture, the Office of Price Administration and Civilian Supply, and the Office of Production Management. The last two were war agencies.

Beginning with August 1941, the Office of Production Management granted manufacturers of farm machinery priority assistance for materials in quantities not exceeding 120 percent of the quantities used in corresponding months in the previous year. This program, called the Civilian Allocation Program, enabled the manufacturers to maintain substantially the expanded rate of production that had been begun in April 1941.

The total production of farm machinery for the calendar year 1941, which was the largest on record, was 24 percent larger than production in 1940. The production in 1940 had also been large; except for 1937, it was the largest production year on record up to that time.

The farm-machinery situation was generally satisfactory at the time the United States became actively engaged in war and it became necessary to issue drastic restrictions on the production of farm machinery.

1942 Program

As the Civilian Allocation Program was intended only as a temporary program, the Office of Price Administration and Civilian Supply in July 1941 requested the Secretary of Agriculture to determine the requirements for farm machinery and other supplies for 1942. To implement this request, a Committee on Production Machinery was appointed the same month. This

committee, under the chairmanship of the head of the Division of Farm Management and Costs in the Bureau of Agricultural Economics, consisted originally of 19 members drawn from various agencies in the Department. The Division of Farm Management and Costs which supplied, in addition to the chairman, six others members to the committee became its operational unit. Studies in this Division on number on farms, size, age and duty of principal farm machines, based on crop correspondents' reports in 1941 and 1942, yielded very useful information. The Committee on Production Machinery served as a program bureau for the Office of Agricultural Defense Relations and its successor, the Office for Agricultural War Relations. Gradually, however, with the building up of an adequate professional and clerical staff in the Office for Agricultural War Relations toward the end of 1942, the work of the committee was no longer required.

The basic information on farm machinery available at the time the Committee on Production Machinery began its work consisted of the annual reports on production and sales of farm machinery issued by the Bureau of the Census since 1921. This series was utilized to good advantage but it appeared desirable to undertake a nation-wide survey in order to have a basis for deciding upon the minimum need for farm machinery in 1942. The State and County U.S.D.A. Defense Boards, that had been recently organized, were chosen to undertake such a survey.

On August 19, 1942, the Secretary of Agriculture requested the U.S.D.A. State Defense Boards to obtain information from each county defense board about (1) the number of machines on farms, (2) the purchases in 1940 and 1941, and (3) the minimum needs in 1942 for some 30 principal machines. The Secretary's letter of instructions stated definitely that the purpose of the survey was "to find out how small a quantity of farm machinery is actually needed by farmers to carry on their farming operations." The main responsibility in carrying out this assignment rested upon the county boards. The State boards transmitted the reports from the counties to Washington as they were received.

In general, the tabulation of the county estimates showed that decidedly larger quantities were needed of milking machines, pick-up balers, and some other harvesting machines than were purchased in 1940. Only moderately more machines than were bought in 1940 were needed of tractors and tractor-drawn tillage implements. About the same or slightly less than the 1940 purchases were needed of horse-drawn implements and other horse-drawn machines.

Production goals for crops and livestock were determined and published for 1942. This was the first time such goals had been established. They indicated the need for an increase in oil crops, particularly soybeans and peanuts. For the other crops, the goals for 1942 were not greatly different from acreages in 1941. For livestock products, particularly milk, the 1942 goals called for considerable increases over 1941 production.

The labor situation on farms in 1941 was showing definite signs of deterioration. As a result of the defense program and the draft for

military service, there were 1,000,000 fewer male workers on farms in July 1941 than in July 1940, with the expectation that the number of farm workers would decline still further in 1942.

In the preparation of the farm-machinery program for 1942 by the Production Machinery Committee, the trend of sales of each individual machine, the estimated minimum needs as reported by the county defense boards for some 30 types of machines, the production goals, and the anticipated labor situation were the principal factors upon which the program was based.

To obtain information on the material requirements per machine so that the program in units could be converted into the required quantities of the various metals, the Committee on Production Machinery asked the Priorities Committee of the Farm Equipment Institute for assistance. That committee prepared on short notice and submitted on September 22, 1941 a report on farm-machinery production, by items, in 1940 and 1941. The report also suggested a production figure for 1942, with the mention of complete material requirements per machine, by groups, and the total. The report was of invaluable assistance to the Committee on Production Machinery when it was preparing the 1942 program in terms of material requirements. In fact, this report became the standard reference with respect to material requirements per machine for 2 or 3 years until improved figures were developed through added experience. The program for 1942 suggested by the Priorities Committee called for a considerably higher rate of production than the high rate in 1941. This indicated that the farm-machinery industry was capable of rapid expansion if it had available the resources with which to produce.

The Committee on Production Machinery had completed the proposed program for 1942 toward the end of September 1941. This program called for a production of 108 percent of 1940 and followed, in general, the level of production indicated as minimum needs for 1942 by the county defense boards. The Office of Agricultural Defense Relations presented this program to the newly organized Supply Priorities and Allocations Board in the latter part of September 1941.

At that time the United States had not become actively engaged in war, but the requirements of critical materials for the expanding defense program were decidedly larger than in midsummer 1941. As a program for expanding production of steel and other materials was not as yet undertaken, the requirements of the defense program had to be met out of a diversion from civilian uses alone. Production of automobiles, for example, had not then been discontinued.

As the Supply Priorities and Allocations Board decided on an allocation of materials for farm machinery for 1942 of 80 percent of 1940, the Office of Agricultural Defense Relations requested the Committee on Production Machinery to prepare a program for new machines whose over-all tonnage requirements would equal this allocation.

The committee had this program ready on October 20, 1941, but the Office of Production Management did not issue Limitation Order L-26 until December 31, 1941. This order, which was retroactive to November 1, 1941, covered the year through October 31, 1942. Schedule A of this order set up quotas in percentages for each machine based on the number of units produced in 1940. The problem as to whether or not quotas for each individual machine should be set up had given rise to considerable discussion. However, in order to assure that the machines most needed for the food-production program would be produced, this problem was resolved in favor of individual machine quotas. After the quotas had been decided and the order had been issued, it was the responsibility of the Office of Production Management to administer it and to assist manufacturers to obtain requisite materials.

Beginning with May 1942, the effect of the war program was decisively felt in the farm-machinery industry. The production of this machinery was drastically reduced as a result of shortages of materials and the conversion to production of war equipment. But as the production had been proceeding at a relatively high rate during the first half of the manufacturing year, it is estimated that the total production for the year was only 10 percent below the quantities authorized.

1943 Program

By the time preparations for the 1943 farm-machinery program began, in the spring of 1942, important organizational changes accompanying actual participation in the war had been effected. These greatly influenced program procedure. The War Production Board was organized with (1) a Farm Machinery and Equipment Branch, (2) an Office of Civilian Supply, and (3) a Requirements Committee. Of these, the Office of Civilian Supply organized a new staff charged with determining farm-machinery requirements among other requirements for civilian needs. The Secretary of Agriculture had been made Chairman of a Food Requirements Committee set up by the War Production Board, and the Office for Agricultural War Relations continued the functions of the Office of Agricultural Defense Relations. Otherwise, there were no organizational changes in the Department of Agriculture.

It was early in the spring of 1942 that the Farm Machinery and Equipment Branch of the War Production Board suggested to the Office for Agricultural War Relations that a minimum program for 1943 be decided upon. The officials in the Office for Agricultural War Relations thought that a definite program for 1943 should not be decided upon before the 1942 season was passed and before the production goals for 1943 had been decided, but the assembling of information to assist in determining a tentative program for 1943 was begun.

The Office for Agricultural War Relations in May 1942 requested Agricultural Experiment Stations to report on farm-machinery needs for 1943. In general, the result of this survey, which was not conducted with a formalized questionnaire, showed that about the same quantity of new farm machinery as had been authorized for 1942 would be required for 1943.

A considerable number of experiment stations, however, reported that agricultural production probably could be maintained with a smaller quantity of new machines than were required in the 1942 program.

The County War Boards at the same time were requested to indicate the machines for which the need was greatest. The reports showed that the need was greatest for harvesting machinery and, in general, for machinery to be used with tractors rather than for tractors themselves.

A tentative program calling for an average of approximately one-half of the quantity of farm machinery produced in 1940 was prepared by the Committee on Production Machinery for the Office for Agricultural War Relations and was discussed with War Production Board officials in the latter part of May 1942.

At a somewhat later date, the Office of Civilian Supply in the War Production Board prepared a program for 1943 which called for a production of 27 percent of the production of 1940. This program was developed on the basis of a formula suggested by the Engineering Department of one of the State Agricultural Colleges. The fact that this program was developed on a formalized basis made a good impression on higher officials in the War Production Board as contrasted to the program of the Committee on Production Machinery which reflected the composite judgment of the members of the committee deciding on each individual item.

The Office of Civilian Supply, which continued to work on this program, presented finally on September 15, 1942 to the Requirements Committee in the War Production Board a program calling for a production of 23 percent of that of 1940. This program was approved in spite of objections by the Secretary of Agriculture and became the basis for the quotas in L-170 which was issued October 19, 1942 covering the production year beginning November 1, 1942. At the time the order came out, only 75 percent of the approved program was actually authorized.

During the summer of 1942, while the actual program level for 1943 was being considered, several other plans affecting the farm-machinery industry were under consideration. The object of these plans was to conserve critical materials and to utilize plants previously devoted to farm-machinery production for the production of war equipment or ammunition.

The main feature of the Concentration Plan developed by the Office of Civilian Supply was to concentrate production of farm machinery among the smaller manufacturers in order to free the larger manufacturers for conversion to production for war. In principle, this plan had much to commend it but it failed to recognize the particular nature of the farm-machinery industry and its dealer service, and it failed to recognize the consequences of the plan on an eventual resumption of farm-machinery production at more nearly required levels. Although the industry and the Office for Agricultural War Relations of the Department of Agriculture objected to this plan, it was adopted and became an integral part of L-170 with three different sets of quotas. The quota to be used would depend upon the size of the company.

Another plan, the Simplification Plan, which would have restricted the production of each type of farm machinery to one model or a limited number of models for each manufacturer was under consideration. It was considered impracticable in view of the variety of needs to be served by agricultural implements so was not discussed further after the Concentration Plan was adopted.

Our national position and the situation in regard to materials in 1942, during the development of the program for 1943, was critical. It called for restraint and understanding on the part of all groups concerned. Yet the decision made by the War Production Board to reduce the production of farm machinery to less than one-fourth of the 1940 output and to accompany it with the Concentration Plan was considered by the Department of Agriculture as inadequate. The Department thought the program would not maintain a reasonable production of farm machinery which was needed to insure a food supply sufficient to meet war requirements.

The issuance of Limitation Order L-170 caused a widespread closing-down of production lines and the laying-off of experienced workers in the larger factories. Hence, the outlook for farm-machinery production toward the end of 1942 was very dark, with prospect of great difficulties if relief from the order could not be obtained.

The situation began to improve with the President's appointment of the Secretary of Agriculture as War Food Administrator and an assignment to him of the planning function for farm machinery which had been held by the Office of Civilian Supply in the War Production Board. The Office for Agricultural War Relations was succeeded by the Food Production Administration as the responsible agency for farm machinery in the Department of Agriculture.

In the months following this change in organization, official concern over food supplies became an effective factor in improving the outlook for farm machinery.

In December 1942, the War Food Administrator requested the chairman of the War Production Board to increase immediately the authorized production under L-170 to 40 percent of 1940 production. In view of higher production goals for 1943 and the steady decline in the farm-labor supply, this quantity of machinery was considered the bare minimum necessary. This program, prepared item by item in consultation with the Committee on Production Machinery, was approved by the War Production Board and incorporated in an amendment to the L-170 order, March 6, 1943.

At the time this program was being considered by the War Production Board, the Special Senate Committee Investigating the National Defense Program, generally referred to as the Truman Committee, investigated the farm-machinery situation. This committee recommended that sufficient materials be allocated to manufacture the farm machinery which those charged with responsibility for food production deemed essential in attaining food

goals. The work of this committee helped to clear the atmosphere and to encourage an improvement and change in policy in the War Production Board.

The Food Production Administration requested again, in April 1943, a supplemental program for combines, corn pickers, and hay balers, as these were considered urgently required in view of reports from the State War Boards that indicated acute shortages of these machines. This program was substantially approved by the War Production Board and allocations to manufacturers were made in June 1943.

Apart from the increases made in authorizations under L-170, the War Production Board, in the early part of 1943, had granted higher ratings for materials to be used for farm machinery and had decided on an acceleration program with the object of permitting the authorized production under L-170 to be completed by June 30 rather than by October 31. Although the quantity of farm machinery authorized for production under L-170 at the time this order ended on June 30, 1943 was about double the quantity of the original program, it is estimated that the actual production during the 8 months was only 20 percent of the production in 1940. Inability of manufacturers to resume production promptly after having been practically shut down was the chief reason for this figure.

Except in the case of corn pickers, the improvement that was in the making by June 30, 1943 came too late to be of much use for the 1943 crop season. This was partly because the L-170 program was announced too late for proper planning of production and obtaining materials for 1943, and partly because time was required to resume production after the many shut-downs occasioned by the original L-170 order.

1944 Program

Important organizational changes affecting farm-machinery program procedure took place during the first part of 1943, both in the War Production Board and in the War Food Administration.

The War Production Board had announced, on November 2, 1943, the Controlled Materials Plan which was to be applied to allocations of materials for the second quarter of 1943, and to go fully into effect on July 1, 1943. The purpose of this plan, which superseded the Production Requirements Plan, was to bring about the adjustment of production programs to conform with the supply of materials and to allot certain materials to different claimant governmental agencies representing all military and essential civilian requirements.

Although the Office of Civilian Supply was designated as a claimant agency for farm machinery at the time the plan was announced, the Food Production Administration of the Department of Agriculture, was soon designated the claimant agency for all machinery needed in food production and processing. As this step involved the transfer of functions from the War

Production Board to the Department of Agriculture, some personnel were shifted from one agency to the other. A Controlled Materials Officer was appointed to administer the presentation of material requirements and other liaison work relative to controlled materials to the War Production Board.

The Office of Materials and Facilities, as part of the War Food Administration, was organized in the late spring of 1943. This office took over the farm-machinery functions previously executed by the Food Production Administration.

The director of the Office of Materials and Facilities became a member of the top committee in the War Production Board -- the Requirements Committee. Members of the staff in the Office of Materials and Facilities were also represented on the Program Adjustment Committee and Requirements Committee of the Farm Machinery and Equipment Division. All these committees in the War Production Board, composed of representatives of claimant agencies, were charged with definite responsibilities under the Controlled Materials Plan.

After the Program Adjustment Committee or, if necessary, the War Production Board Requirements Committee had made a decision on quarterly allotment of material to the War Food Administration for farm machinery, these materials were transferred to the Farm Machinery and Equipment Division for issuance to manufacturers in accordance with applications based on current quotas for each machine.

Representatives of manufacturers who from time to time, since the beginning of production control, had attended meetings at the invitation of the War Production Board or its predecessor agency became formally organized as the Farm Machinery Industry Advisory Committee.

Although it was the responsibility of the farm-machinery staff in the Food Production Administration and later in the Office of Materials and Facilities to determine requirements of farm machinery for consideration by the War Production Board, this staff sought the advice of the regional representatives of the Agricultural Adjustment Agency. This group, consisting of a Special Assistant to the Chief of the Agricultural Adjustment Agency and one representative for each of the five AAA regions carried out required programs in the field through the State and County organization. Because of these field connections, this group not only participated in the formulation of field programs but also assisted in the determination of farm-machinery requirements. The work of the Committee on Production Machinery, which had been serving since July 1941, was no longer required under the new organizational set-up.

In view of the acceleration of the L-170 program and the benefits that would accrue to production of farm machinery for use in 1944 by beginning the new program year on July 1, the preparation of a tentative 1944 program began early in 1943. It was planned to announce it to manufacturers in time for them to file applications for materials in the third quarter of 1943.

It was on the assumption that the tentative program would serve this purpose only that the Food Production Administration found it opportune to prepare a program at that early date.

At the time this tentative program was being prepared, steps were being taken to obtain suggestions from manufacturers and particularly to obtain estimates of requirements, item by item, for each State from each State War Board. These estimates were to be used as a basis for a firm 1944 program, to be presented at a later date when 1944 production goals and the labor situation that would probably prevail could be ascertained with more certainty.

The tentative program for 1944, calling for a quantity of new machines equal to 80 percent of 1940, was presented to the War Production Board in March 1943. When justifying in detail some of the requirements for the major item of farm machinery, information was used from a study conducted by the Bureau of Agricultural Economics on number, age, and duty of principal farm machinery on farms. On the basis of this information the requirement for each type of machine was broken down into (1) number required for replacement, (2) number required to increase acreage, and (3) number required to compensate for the continuing reduction of farm labor.

This method of justifying the need for farm machinery, which was used for the first time in presenting the tentative program for 1944, proved to be very effective and was later used extensively not only for annual and supplemental programs but also to justify each quarterly request for materials. The tentative program, presented in March 1943 was approved by the War Production Board. The tentative quotas for 1944 were set forth in CMPL-165 (Controlled Materials Plan Letter) which was distributed to manufacturers as a basis for applications for materials for third quarter, 1943, pending a determination of a firm program as a basis for a new limitation order.

The requirements for farm machinery for 1944 in each State, as reported by the State War Boards, were based on county summaries of farm-to-farm visits and on other pertinent information. The national summary of the State requests constituted, for the most part, a comprehensive and dependable record of requirements.

Experienced personnel in both the Food Production Administration and the War Production Board cooperated in the preparation of the 1944 program. The requirements for each item of machinery were carefully determined and a justification was prepared for each item. This program, which had been formulated by the middle of May 1943 called for a quantity of new farm machines, approximately the same number as were manufactured in 1940.

The call for 80 percent of 1940 in the tentative program became the program level for 1944 largely because the military situation had become such that it would have been of no avail to present the larger

program at the time it was completed. But after downward revision to the same material requirements as given in the tentative program, this latter program became the basis for quotas in Schedule A of Limitation Order L-257 which was issued June 15, 1943.

In addition to the fact that Schedule A of L-257 stipulated production at a level of 80 percent of 1940 quotas for the year beginning July 1, 1943, all authorizations under L-170 remained in effect. As the authorizations thus brought forward amounted to about one-fourth of the new program, as it was later determined, the total permissible production at the start of the program year was as large as 1940 production.

In September 1943, the Office of Materials and Facilities presented a supplemental harvesting-machinery program to the War Production Board. This program was requested by that office principally in view of the production goals for 1944 which were substantially larger than those for 1943, particularly in regard to wheat. After an exhaustive check on the feasibility of the program, the War Production Board approved it. Allocations to the different manufacturers were made in January 1944. Because the War Production Board, as the year progressed, approved a considerable number of appeals from manufacturers -- including appeals from three manufacturers for additional tractor production -- the total volume of authorizations or production actually scheduled for the year was considerably larger than in 1940. This was particularly true for harvesting and haying machinery. The net allotments of carbon steel to manufacturers of farm machinery for domestic farm use totaled 1,235,000 tons, of which 180,000 tons were for repairs for the year beginning July 1, 1943.

Limitation Order L-257 contained many improvements in comparison with the previous orders that had covered farm-machinery production. Most important, the Concentration Plan was discontinued and manufacturers were required to submit monthly production schedules and to report each month on actual production. In August 1943, the order was amended to make it a permanent order, with the particular schedules of quotas to be announced each year. The formula used for calculating percentage quotas for each machine by manufacturers was based on production in 1940 or 1941, whichever was higher, and the control was on shipping weight rather than on number of machines as in L-26. Although the quotas for each machine were understandable to individual manufacturers, the particular technique used in calculating base production made the quotas deceptive so far as public information was concerned. For example, if 10,000 units of a machine were produced by the industry in 1940 and 13,000 in 1941, the base production as used by the War Production Board would be 13,000 provided each manufacturer produced more in 1941 than in 1940. But if some manufacturers produced more in 1940 than in 1941, the base production would be larger than 13,000 and the quota would be correspondingly smaller.

The Farm Machinery and Equipment Division in the War Production Board, charged with the administration of L-257, proceeded to expedite production aggressively. With the additional information currently

received from manufacturers, it was possible to keep abreast of developments from month to month and to transfer quotas in frequent instances. Shortages of component parts like malleable castings, engines, chains, and disks had become serious bottlenecks to farm-machinery production; to assist manufacturers in breaking these bottlenecks a corps of expeditors was stationed in the vicinity of the main production center.

In addition to problems regarding special material, the manufacturers were faced with the problem of hiring and training new workers. Although production of farm machinery increased decidedly during the last half of 1943 and the higher rates continued into 1944, the actual production, up to the time machinery was needed for spring use, was behind schedule by a sizable percentage.

With the grace period of 1 month for all machines except certain harvesting machinery (for which the grace period was 3 months) the total scheduled production of farm machinery during the 1943-44 year was mostly completed, although the production of much of it was later than scheduled. About 10 percent more new machines had been produced than in 1940. With this volume of production, most of the essential needs were being met although the total output was much less than the farmers wanted to buy.

1945 Program

As the operation of the Controlled Materials Plan required advance planning of production, the preparation of the program for 1945 began in the fall of 1943. If manufacturing was to begin under the new program, on July 1, 1944, materials should be allotted in the second quarter of 1944. Requests for materials for use in that quarter were due on January 20, 1944. Agricultural engineers from Experiment Stations and Agricultural Colleges, located in different areas of the country, and production men from the major farm-machinery companies, were invited to meet in Washington, D. C. in November 1943 to discuss the farm-machinery situation and the requirements for 1945. Members of the staff of the Office of Materials and Facilities and the War Production Board also attended the meeting. The food and labor situation and prospective food production goals for 1945 were reviewed to build a background for the discussions. At this meeting each item of farm machinery was discussed and suggestions were made for requirements in 1945. Information from the State AAA Committees as of November 1943 on requirements for 1945 in each State for a specified list of the most important machines was requested. Regional, State, and County representatives of the AAA were also consulted in the formulation of the program.

The 1945 program on a material-requirement basis was appreciably in excess of the 1944 program. It was presented to the War Production Board on November 30, 1943. The attitude of the policy-making officials in the War Production Board at that time was one of keeping the program for 1945 within the limits of the already-scheduled production for 1943-44 for tractors and other engine-bearing machines.

At the direction of the War Production Board, the Office of Materials and Facilities reduced the estimated tractor requirements by some 20,000 tractors and reduced accompanying equipment correspondingly. The adjusted 1945 program was presented to the War Production Board on December 30, 1943.

So far as tractors were concerned the proposed production was equal to the scheduled production for 1943-44 and, as a whole, was nearly as large as scheduled production, which consisted of that authorized by L-257, Schedule A, and the carry-over from L-170.

This program was approved by the War Production Board and became the basis for the quotas in Schedule B to L-257 issued February 3, 1944. According to this schedule, the bracketing of items was allowed extensively in order to give manufacturers the privilege of departing from a strict observance of the quotas for each item within the same group although the quotas still served as the formula for distribution of materials.

Shortage of labor progressively limited the farm-machinery production. Continuing difficulties in obtaining certain component parts were also largely attributable to labor shortages in suppliers' plants. Allocation of critical materials was under centralized control but labor was under the decentralized control of a number of committees in various parts of the country. Bottlenecks in production caused by shortage of labor in manufacturing plants and foundries proved to be a much more difficult problem than shortage of materials. As manufacturers felt the effect of labor shortages in varying degrees, the use of production quotas became an obstacle to the completion of the approved program.

During the summer and fall of 1944, the Office of Materials and Facilities requested supplemental programs for tillage equipment for spring use in 1945. Reports from the State AAA Committees on harvesting machinery indicated that Schedule B was inadequate for tractors and for harvesting machinery. These programs, however, were not approved by the War Production Board.

The net allotments of carbon steel to manufacturers of farm machinery for domestic farm use totaled 1,160,000 tons (of which 175,000 tons were for repairs) for the year beginning July 1, 1944.

The War Production Board approved some appeals from manufacturers, including some asking for increased production of tractor cultivators, but the total scheduled production was not so large for 1944-45 as for the previous year. Actual production was also trailing. Production of tractors continued almost according to schedule during the year but apart from tractors, production was about 20 percent behind schedule. The end result for the year probably showed a somewhat better performance but the actual production was substantially behind the quantity scheduled.

1946 Program

As preparation of the program for 1946 proceeded in the Office of Materials and Facilities in the fall of 1944, the day-to-day situation on the European battlefront influenced the outlook for approval of a farm-machinery program for 1946.

At the time the program was ready for submittal on December 20, 1944, the Battle of the Bulge had created a time that was exceedingly unfavorable for the consideration of a program for the production of farm machinery that was nearly 30 percent larger than the year before. This program, however, had been determined item by item on the basis of requirements to produce the food and fiber necessary to reach the goals for 1946.

The program was submitted formally to the War Production Board on February 13, 1945, but was not approved. Instead, the Board declared that a minimum allocation of materials for the second quarter, requiring a nearly 25-percent reduction in Schedule B, would be available, with the prospect of an increase in later quarters. The Office of Materials and Facilities prepared a program in accordance with the minimum allocation of materials to serve as a basis for the new Schedule C. Subsequently, however, in view of the improvement in the military situation on the Continent, the reduction in manufacturers' allotments was cancelled and the new Schedule C, without quotas, was issued May 17, 1945.

It was contemplated that an allocation of materials corresponding to requirements of the original program for 1946 would be available, but the scheduled production by manufacturers was considerably in excess of that program.

With the revocation of L-257 on August 21, 1945, the governmental control of farm machinery which had been in effect for about 4 years was ended. Ratings on material was discontinued September 30, 1945. After that date a new system of ratings would be used to relieve bottlenecks as an aid in the reconversion program.

Wartime production of farm machinery and the effect on farm mechanization are summarized in tables 1, 2, and 3.

DISTRIBUTION

Wartime restrictions of the output of farm machinery in the face of growing demand resulting from greatly increased farm income, raised problems of price control and rationing. The Office of Price Administration began the control of farm-machinery prices before the adoption of control of production, and continued price control after production control had been discontinued, but the rationing of farm machinery was in effect for only 2 years -- from 1942 to 1944.

The rationing of farm machinery that had been produced under the first limitation order, L-26, was considered by officials in the Department

of Agriculture in the fall of 1941. A subcommittee of the Committee on Production Machinery, designated to study rationing problems, suggested that eight types of machines be placed on the rationing list but as the officials in charge of the field organization did not consider such a step necessary, the question of rationing was dropped.

The Office for Agricultural War Relations prepared, in the early summer of 1942, a proposed distribution of combines, by States, which was circulated among manufacturers, but it was not until August 1942 that the question of rationing was again seriously considered.

Considerable criticism of the manufacturers' distribution of farm machinery in 1942 had been reported by State War Boards. It was these reports, in addition to the exceedingly poor farm-machinery outlook for 1943, which prompted the officials in charge of the field organization to request that rationing be instituted. Rationing was considered necessary to ensure (1) that the farmers who were contributing the most to food production would obtain available machines and (2) that distribution among production areas would reflect the increases and shifts in crops that were necessitated by the food program.

As it was not anticipated that the trade would accomplish these objectives, it was decided to begin the rationing of a limited number of machines to individuals pending the development of a later more comprehensive program with control of distribution among areas.

Some of the work required for the development of a rationing procedure had been done by a subcommittee of the Committee on Production Machinery in 1941; and a Critical Materials Committee appointed in the summer of 1942 assisted in developing the procedure that was put into effect. One of the phases of this Committee's work was the determination of standards of use for each machine, State by State.

Rationing of farm machinery, even though considered necessary by the Department of Agriculture, need not have been done by that particular organization. It might have been done by the War Production Board which possessed the authority both to control production and to control distribution to individuals, or by the Office of Price Administration which rationed other products including some farm supplies.

The decision of the Department of Agriculture to undertake rationing of farm machinery rather than recommending that it be done by another agency, was prompted in part by the assumption that the organization of State and County War Boards could carry out the task of rationing more efficiently and fairly than any other agency.

After the War Production Board had delegated authority to ration farm machinery to the Office of Price Administration which re-delegated the authority to the Secretary of Agriculture, the first rationing order, Temporary Rationing Order A, was issued September 17, 1942. According to it, only 18 types of machines were rationed. Distribution control of shipments to the various areas was not exercised.

Table 1.- Authorized production of new farm machinery and attachments (excluding repairs) for domestic farm use, 1942-45, in comparison with production, 1935-41 ^{1/}

Year or program	Description	Production
		1,000 dollars
1935-39	Calendar year average	310,000
1940	Calendar year	358,866
1941	Calendar year	460,417
1942	L-26, 11-1-41 to 10-30-42	287,093
1943	L-170, 11-1-42 to 6-30-43	163,000 ^{2/}
1944	L-257, Sch. A, 7-1-43 to 6-30-44	344,238 ^{3/}
1945	L-257, Sch. B, 7-1-44 to 6-30-45	360,896 ^{4/}

^{1/} Based on unit conversion to value at 1940 manufacturers' prices. ^{2/} Original L-170 program \$86,792,000. ^{3/} Original L-257, Sch. A program \$292,483,000. With \$76,885,000 carry-over from L-170, the total authorized production for 1943-44 was \$421,123,000. ^{4/} Original L-257, Sch. B program \$355,146,000.

Table 2.- Production of specified types of farm machinery for domestic use, 1935-45

Year or program	Wheel-type tractors	Combines	Corn pickers	Pick-up balers	Milking machines
	Units	Units	Units	Units	Units
1935-39	158,895	23,864	9,982	-	14,661
1940	220,009	43,816	11,436	2,045	31,526
1941	278,633	53,799	15,894	8,962	73,182
1942	150,374	38,975	12,367	8,311	89,191
1943	30,416	14,382	496	1,036	28,041
1944	188,890	45,836	29,681	15,115	65,983
1945	154,278	39,687	18,404	9,123	66,435

Bureau of the Census and War Production Board.

Table 3.- Number of specified types of farm machinery on farms, January 1, 1942-45

Year	Tractors	Combines	Corn pickers	Pick-up balers	Milking machines
	1,000 units	1,000 units	1,000 units	1,000 units	1,000 units
1942	1,844	269	130	25	255
1943	1,919	298	138	31	309
1944	1,953	312	146	34	345
1945	2,072	330	168	42	379

Bureau of Agricultural Economics.

Rationing the designated types of machines by issuance of purchase certificates to individuals was done in each county by a County Farm Rationing Committee. The Chairman of the County War Board and the County Agricultural Conservation Committee served also as chairman of the Rationing Committee.

The local rationing committees reported to the State War Board in their State. This Board was under the chairmanship of the Chairman of the State AAA Committee. The Special War Board assistant to the Secretary of Agriculture issued instructions to the State War Boards through the regular AAA divisional channels. Formulation of the rationing program was done by the Office for Agricultural War Relations in consultation with the regional representative of the field organization.

1943 Program

The drastic reduction in farm-machinery production for 1943, effective November 1, 1942, was accompanied by similarly drastic action in the field of rationing and distribution. This was done through issuance of Temporary Rationing Order B, effective the same date.

This order "froze" the entire inventory of farm machinery then in commercial channels. To suspend business in all farm machinery while a complete new program was being prepared was considered essential for, in the absence of such action, the remaining inventory would have been disposed of quickly without regard to individual needs.

The permanent rationing and distribution program, Rationing Order C, became effective November 28, 1942. Under this program 65 types of machines were rationed. State and county quotas were determined for 31 machines and State quotas only, for 34 machines.

The State quotas were originally prepared by the Committee on Production Machinery, based on data regarding the number of machines in each State and production goals for 1943. These quotas were later revised in view of suggested State distribution by manufacturers, and other information. In fact, some of the quotas for harvesting machinery were worked out at a joint meeting with manufacturers. County quotas were worked out by State War Boards. As the operation under county quotas tended to hold up distribution the majority of the county quotas were cancelled later.

After quotas had been determined, directives were issued to the manufacturers requiring them to attach a tag to each machine showing State and county destination. This was deemed essential to ensure that machines were actually delivered in quantities equal to county quotas on the basis of which purchase certificates had been issued.

The disruption of the quantitative relationship between manufacturers' products which the concentration plan under L-170 had brought about, together with the extremely limited quantity of available farm machinery,

created perplexing problems of rationing. Under these circumstances it could not be helped that some makes of machines were distributed to some areas in which they had not previously been sold or to which they were not very well adapted. However, the choice was between these machines or none at all of this type.

To match the issuance of purchase certificates with the production was another problem, as quotas were based on anticipated production for the year, and eventually the figures proved not to be dependable. The purchase certificates issued sometimes exceeded the number of machines that were actually forthcoming. To avoid this, the practice of not issuing certificates until the machines had actually arrived became prevalent in some areas.

It was generally agreed that, in spite of the shortcomings, the rationing program on the whole served a useful purpose. An examination of the distribution of small combines, for example, seemed to reveal that the manufacturers' suggested distribution followed a historical pattern, whereas the actual distribution on which directives were based differed considerably from this pattern because it allowed the proper weight to increases and shifts that had taken place in crop production since the war began.

1944 Program

The increase in farm-machinery output for 1944, which the issuance of L-257 made possible, brought about a revision of the rationing program.

The new rationing program for 1944, Food Production Order 14, became effective October 15, 1943. According to this program, 19 types of machines were rationed and State and county quotas were determined for them. For 12 types of rationed machines, State quotas only were determined; and finally, for 15 types of machines, which were not rationed, State quotas were determined. However, only 20 percent of the production of these types was subject to the distribution control of the War Food Administration, for 80 percent was distributed at the manufacturers' own discretion. For types of machines for which county quotas were required, the State AAA Committees were authorized to make adjustments up to 10 percent of the State totals.

The distribution control and rationing program was much more simple and more flexible for 1944 than for the previous year. To hold back a reserve of 20 percent for distribution by the War Food Administration was considered an adequate device for achieving the desired objective of meeting State quotas in the event any company did not produce the scheduled quantity and of meeting particular needs arising from shifts in production or emergency situations.

Although the staff of the Farm Machinery and Equipment Division in the Office of Materials and Facilities prepared the State reserve quotas in consultation with the regional representatives of the Agricultural Adjustment Agency, several joint meetings were held with manufacturers before the directives were issued.

Administration in the field of rationing and allocation of farm machinery, which previously had been carried out by the State and County War Boards, was assigned to the State and County committees of the Agricultural Adjustment Agency, effective October 29, 1943. Similar organizational changes in Washington assigned the administration of the rationing program to the AAA under the direction of the Office of Materials and Facilities.

Some of the difficulties experienced during the previous year with regard to production being delayed or not forthcoming among some manufacturers, whereas others produced additional quantities, also created perplexing problems for the rationing program in 1944. But that the distribution and rationing program in 1944 served the purposes of food production is exemplified by the distribution of side-delivery rakes. In view of the new uses for this implement in some areas, particularly in the Southern States in peanut production, the distribution of the reserve, as agreed on in a meeting with manufacturers, was decidedly different from the manufacturers' suggested distribution which was mainly based on past sales.

1945 Program

The program for distribution and rationing machinery produced under Schedule B of L-257 became effective July 20, 1944 (War Food Order 14 as amended).

As the outlook for 1945 production generally indicated a continuation of the level of production authorized under the previous production program, the rationing and distribution program was further liberalized. Only 19 types of machines were rationed on the local level and of these a distribution program was set for 14 types. State and county quotas, with rationing, were in effect for 9 types. Otherwise, with an 80-percent free distribution and with 20 percent subject to control by the War Food Administration, it was the same as in the previous year.

It had been optional for the County Farm Rationing Committees to issue purchase certificates after the machines had actually arrived. This method had been used successfully in some areas under the previous program. It became mandatory under the 1945 program. First, the local rationing committee issued a letter of eligibility which authorized a farmer to negotiate for a machine. Upon presentation of proof that the machine was available, this letter was converted into a purchase certificate by the committee.

On September 28, 1944, the War Food Administration announced the discontinuation of the distribution control and rationing program for all types of farm machines excepting corn pickers. The program for these machines was discontinued about a month later.

The decision to discontinue rationing was made primarily on the basis that wartime shifts in agricultural production had now been completed and they were now recognized by farm-machinery manufacturers.

REPAIRS

When it became evident in the fall of 1941 that production of new farm machinery in 1942 would be restricted, a subcommittee of the Committee on Production Machinery devoted considerable attention to the problem of repair and conservation of farm machinery. That this problem was important was emphasized by the reports from County War Boards which indicated not only shortages of repair parts (particularly tractor parts) in 1941 but also a lack of adequate repair facilities in many areas.

To inaugurate a repair campaign among farmers, the Secretary of Agriculture on October 23, 1941 sent a letter to the USDA Defense Boards suggesting an organization and procedure for a machinery-repair program, together with a letter to individual farmers urging the repair of their machinery at an early date. On November 1, 1941, the Secretary followed up by a letter to manufacturers to enlist their cooperation. To mobilize the country-wide Agricultural Extension Service for participation in the repair program, the Director of Extension wrote to State Extension Directors on October 30, 1941. These steps launched a program which continued during the war years and grew into a varied and sizable undertaking which has brought real benefits. Other Government agencies and local groups assisted in the program which was carried out by various methods. They included giving local training courses for farm mechanics, operating itinerant repair units, use of publications and posters, and sundry other activities. The farm-machinery manufacturers and dealers cooperated throughout the program.

Although production of repair parts was somewhat limited by quotas that were fairly liberal under L-26 and L-170, there was no limitation on production after July 1, 1943. Manufacturers' requests for material to manufacture repair parts were always given preferred treatment by the War Production Board.

The quantity of repairs actually sold to farmers during the war years was much greater than those sold in prewar years. This reflected, in part, the fact that many old machines which ordinarily would have been discarded were being kept in operation. The situation in regard to repairs in general, was satisfactory during most of the war, but shortages of component parts, which affected the output of new machinery, created difficulties and delays in obtaining some special repair parts.

Attachments to farm machinery were subject to the same production limitation as repairs under L-26. Under L-170, however, the quotas for new machines governed attachments also. Under L-257, the same procedure, or an optional procedure of lumping all attachments together with a 75-percent quota of base production, was in effect until May 17, 1945. On that date, production limitation on attachments was discontinued.

The quantity of attachments required during the war was in excess of the mere outfitting of machines currently bought, for machines bought before the war needed to be outfitted with attachments that were suitable to

new production practices. The use of various attachments on combines in the harvesting of an expanded acreage of dry peas was one example of the growing importance of attachments.

CUSTOM WORK

Custom work and other forms of a fuller utilization of farm machines were encouraged and were given preferences in the course of rationing new machines, but no formal program was in effect except for combines. The custom combine program, in operation in 1944 and 1945, facilitated the movement of combines and crews from one area to another, as the season progressed, by assisting operators to obtain necessary supplies for their operations; it also provided information about farmers who needed to have combining done. Crossing the Canadian border was made easier by simplified custom procedure.

The County and State Committees of the Agricultural Adjustment Agency administered this program which operated chiefly in the Great Plains States.

The application of the Government's requisitioning power to bring idle farm machinery into use was outlined and distributed to State and County Committees in the spring of 1943. Requisitioning of farm machinery was resorted to in a few instances only. Generally speaking, there was no idle farm machinery.

CRAWLER TRACTORS

Unlike wheel-type tractors which were included in the program for farm machinery, crawler-type tractors were included in the program for construction machinery.

World War II was an earth-moving war. The construction projects that were undertaken by our military forces all over the world, in addition to activation of troops in zones of operation, required a truly gigantic quantity of construction machinery of all descriptions. In fact, the many purposes to which crawler tractors (bulldozers) were put in military operations exceeded any anticipated by the military forces at the beginning of the war.

As a result, inadequate measures were taken at the beginning of the war to meet the huge military requirements that developed. The inevitable consequence was that shortages of this equipment for civilian use became critical. Although the production of crawler tractors was about twice as large at the time the war ended as at the beginning of the war, it was only during the last year of war that this rate of production had been accomplished. During most of the war the military was allocated 85 percent of the production of crawler tractors for sizes over 35 h.p. Complete control of distribution of crawler tractors to individuals was exercised by the War Production Board from February 19, 1942 to August 23, 1945.

Because crawler tractors, regardless of size, were classified as construction machinery rather than farm machinery, they were controlled by a different set of orders under the administration of the Construction Machinery Division in the War Production Board. In view of the overwhelming interest on the part of the military in production of crawler tractors over 35 h.p., the record of meeting scheduled production of these sizes from available facilities was very satisfactory in general.

The main problems regarding crawler tractors arose in connection with the distribution of the output from a production capacity that was very limited relative to war needs. The determination of allocations to the various claimant agencies was particularly difficult, and in several instances decisions were referred to the Requirements Committee of the War Production Board. Although the organization of claimant agencies in the early part of 1943 brought about an improvement in distribution for the various uses, it was not until the early spring of 1944 that a program for a whole year was determined, after extensive considerations.

The allocation of crawler tractors to agriculture was about one-third and one-fifth of prewar sales in 1942 and 1943, respectively. Production of crawler tractors, under 35 h.p., which are used primarily in agriculture was prohibited, for the most part, during those 2 years. With the resumption of production of small tractors in 1944, on a limited scale, the allocation for that year improved.

The shortage of crawler tractors began earlier, became more severe, and lasted longer than the shortage of wheel-type tractors or other major types of farm equipment. At the time the war ended production of tractors in the 25 h.p. group was decidedly below prewar figures although production of all other sizes had increased substantially. As production and distribution of tractors was under centralized control, delivery of a tractor for which release had been issued was a matter of a few weeks.

Distribution of crawler tractors for civilian uses was rigorously controlled. For each quarter, each claimant agency was given an allocation by classes in accordance with an established program. The tractors were then released, by models, by the Construction Machinery Division to individuals once the applications had been reviewed and recommended by the claimant agencies.

After the control of the distribution of crawler tractors began on February 19, 1942 all applications from farmers were received by the Office for Agricultural War Relations and were transmitted with recommendations to the War Production Board. This procedure was later changed to require an applicant to obtain recommendation from the county war board before the application was filed with the field office of the War Production Board. None of these methods worked satisfactorily because all involved the collection of all applications in Washington, with the attending opportunities for agents of applicants to exert influence on decisions. To improve the distribution of crawler tractors, State War Boards (particularly those of the Pacific Coast area) during the summer of 1943 requested that State quotas be determined.

A special distribution program for crawler tractors for agricultural use was in effect from September 1, 1943 until control was discontinued on August 23, 1945. Under this program, State quotas were determined for each quarter and the applications in the field were handled by the county and State committees of the Agricultural Adjustment Agency. These committees had definite responsibilities which were designed to reduce the number of applications reaching Washington to a reasonable figure in relation to the number of tractors available each quarter.

The large requirements of the military forces for new tractors was accompanied by similarly large requirements for tractor repair parts. As inadequate steps were taken to increase the production of parts at the beginning of the war, the shortage of repairs for crawler tractors was particularly critical in 1942 and 1943. Gradually, with a definite percentage of production set aside at the factory for the military forces and with large increases in over-all production, the repair situation improved toward the end of the war. A special expediting program for parts needed by farmers was in effect during most of the war.