

Reviews

PLANNING MINIMUM SIZED FARMS

A Survey of Beadle County, in central South Dakota, shows many problems typical of the Great Plains. The wide and frequent variations in precipitation, which coupled with periods of low prices, have shown a need for a type of agriculture capable of supporting the farm population during adverse conditions.

The two townships, Vernon and Richland, which were selected for intensive study, showed that a farm organization of livestock and cash grain appears to be most adaptable to the region. The livestock enterprises would vary with the operators' experiences or tastes. However, the livestock enterprises would tend to increase the hazards of drought unless a 2 years reserve of feed was maintained. "The need for direct Governmental assistance in the area is likely to continue unless operators are able to build up their farms and prepare for future adverse periods by accumulating feed and financial reserves."

In 1937 a high percentage of tenancy existed in this area. For this reason a rental basis was used to calculate the minimum sized farm. A good operator on an average 480 acre farm with \$1,000. equity in his livestock and machinery could build up his farm organization, (assuming medium production of crops). This would take a period of 7 years according to the proposed plan. During the period of rebuilding, the operator would have \$400 for cash family living expenses, and would increase his equity in the farm business by \$325. He would be allowed a house, 2 hogs, a yearling steer, 70 chickens, 200 dozen eggs, and 300 pounds of butter fat for family use each year. If the operator wanted a higher standard of living or if payments were to be made on a farm, the size of the farm would have to be larger than 480 acres.

Rehabilitation of farm operators and rebuilding of farm units would require liberal credit terms. Inadequate credit for rehabilitation would make it necessary to start

with larger rented units, do more cash crop farming, obtain long term leases, or obtain F.S.A. grants. A combination of these would likely be used. Operators whose finances permit should be encouraged to buy farms at times when purchases can be made in keeping with the long time productivity of the land. Ownership would stabilize the tenure of the land and would be an incentive for building feed reserves. "It would seem that there might be a place for an 'ever-normal haystack' program similar to the ever-normal granary now being used for corn." Paschal, James L., Nelson, Aaron G., Rogness, Olav. "Planning Minimum Sized Farms for the Beadle County Area in Central South Dakota", Bul. 341, S. Dak. Exp. Sta., Brookings, 1940. 63 pp. (H.S.A.)

REPORT ON LOSS BY DAMAGE OF 1940 DURUM WHEAT CROP

An investigation into the effect of the blight and other damage of the 1940 durum wheat crop in North Dakota on the macaroni-making quality of the wheat and the effect of the injury on grain to be used for seed was recently made by the North Dakota Agricultural Experiment Station.

W. E. Brentzel, station plant pathologist, found that most of the damage was done by fungi which do not originate from the seed from which the grain grew. He found some "black point" which may cause seedling blight and root rot, but the causal organism was not present in serious amount. All such infected seed should be thoroughly cleaned, graded, tested for germination and treated with Ceresan or other organic mercury dust before planting, Brentzel recommends.

R. H. Harris and L. D. Sibbitt of the Department of Cereal Technology made semolina from damaged samples and tested the macaroni-making value. Their results show that durum wheat carrying the type of damage present in the 1940 crop produces a lower yield of semolina containing more specks. Speckiness tends to degrade the color rating of macaroni. Color is the chief

quality factor in macaroni evaluation due to the popular demand for a deep, rich amber color. Gray or light colored macaroni and semolina are viewed with disfavor by the consumer. Brentzel, W. E., Harris, R. H., and Sibbitt, L. D., N. Dak. Agr. Exp. Sta., Bul. 296, 1941. (G.L.S.)

COOPERATIVE ASSOCIATIONS IN NORTH DAKOTA

Leading organizations among the 578 cooperative associations active in North Dakota in 1937 were farmers elevators. In second place were livestock shipping groups with 112, and oil associations were third with 93.

Others in the State included 20 creameries, 16 cream shipping associations, 6 wool pools, 4 potato associations, 6 potato warehouse groups, and 1 each of the following: cold storage locker plants, poultry sales association, honey cooperative, alfalfa seed association and cooperative exchange.

These facts were determined in a survey conducted jointly by the North Dakota Agricultural Experiment Station and the Farm Credit Administration. A total of 70,023 members were reported by the associations, of which 58,710 were member patrons.

The associations involved in the survey marketed farm products valued at approximately 18 million dollars and sold farm supplies worth around 8 million dollars. Combined assets of the cooperative associations were listed at more than 10 million dollars. Ettesvold, W. L., N. Dak. Agr. Exp. Sta., Bul. 294, 1940. (G.L.S.)

BACTERIAL RING ROT OF POTATOES NOT SPREAD BY GRASSHOPPERS

Tests conducted by the North Dakota Agricultural Experiment Station show that grasshoppers do not spread bacterial ring rot of potatoes.

Since the appearance of bacterial ring rot in the State in 1939, it was thought possible that grasshoppers might gather up the disease-producing bacteria while feeding on foliage of infected plants and later

transmit the disease when feeding upon healthy plants. In these tests grasshoppers were allowed to devour considerable portions of potato plants affected with bacterial ring rot and immediately afterward transferred to healthy plants. No indication of transmittal of the disease by the grasshoppers was found.

The tests were subjected to controlled conditions in the greenhouse and under natural conditions in the field, but the grasshoppers failed to establish the disease in healthy plants.

Station investigators concluded from their findings that the principal source of dissemination of bacterial ring rot appears to be infected seed, contaminated implements, and storage facilities contaminated by infected potatoes. Brentzel, W. E., and Munro, J. A., N. Dak. Agr. Exp. Sta., Bul. 295, 1940. (G.L.S.)

ALIEN PLANTS GROWING WITHOUT CULTIVATION IN CALIFORNIA

An earlier author is quoted, "The behavior of foreigners on our soil should in all cases be carefully observed and will form a distinct contribution to the botanical history of the state". In this bulletin about 500 species are listed and their history in California is reviewed. The grass family with 111 species, and the sunflower family with 96 species, are the largest groups. There are no less than 13 annual, weedy species of brome grass.

California is a long way from North Dakota. It is a much larger State and provides conditions for plant growth ranging from tropical desert to Alpine peaks. North Dakota has possibly 200 alien plants and our problems have much in common with California. We are grateful for such a compilation. Wild oats receives three pages of discussion. It is believed to have been present in California previous to 1800. Russian thistle was first recorded in Los Angeles County in 1895. The history of Russian Knapweed has been much the same there as in North Dakota, but they have one other perennial and five annual related species. Canada thistle appeared about 1870 and two years

later the first weed law was enacted to check its spread. Natural conditions apparently aided in keeping it in the northwestern part of the State.

Robbins, W. W. Calif. Agr. Exp. Sta. Bull. No. 637. 128 pp. 1940.
(O. A. S.)

Bindweed Control as Related to Food Stored in Roots

Effective control of this very persistent weed must be based on a knowledge of root reserves, especially readily available carbohydrates such as starch and sugar. It is from these reserves that energy and building stones for new top growth are obtained. Any treatment which reduces these root reserves will naturally weaken the plant and make for easier and more efficient control.

Dr. Barr of Colorado has recently made a rather extended study of foods stored away in the roots of bindweed under various systems of control. He finds that total sugar and starch reserves reached a maximum in late October and declined to a minimum in May for undisturbed plants. Cultivation of plants at 2-week intervals reduced the readily available carbohydrate accumulation to about 16 percent of that of undisturbed plants. Systematic cultivation all season at emergence, and at 3, 6, 9, 12, or 15 days after emergence resulted in uniformly low carbohydrate content and showed that the more frequent cultivations were no more efficient than less frequent cultivations in reducing reserves in the upper part of the root system.

Reserves were reduced to a lower level by cultivation than by treatment with sodium chlorate. A combination treatment of sodium chlorate following early cultivation did not increase the effectiveness of the former in reducing root reserves. Chlorate applied in the fall was more effective in reducing root reserves than earlier applications.

Dr. Barr's studies are of particular value in that they support the contention that cultivation at 2 week intervals, rather than weekly intervals is just as effective for the control of bindweed and that fall applications of chlorate are more ef-

fective for control than early-season applications. C. G. Barr. Jour. Agric. Res. 60: 391-414. 1940.
(E. A. H.)

The Behavior of Boron in Soils

Boron, one of the naturally occurring soil minerals, is of interest to farmers of North Dakota since it often causes injury to plants owing to its excessive accumulations in the soil in regions of low rainfall and in irrigation waters carrying amounts of boron which sooner or later result in toxic concentrations in the soil. Also attention is now being turned to the possibility of using this chemical to replace or supplement chlorates to control weeds since it is so extremely poisonous to some plants even when present in small quantities and is non-poisonous to animals and does not create a fire hazard. Used in extremely small quantities by plants, concentrations below 0.1-0.5 parts of boron per million parts of soil are generally insufficient to support normal plant growth while amounts in excess of 0.5 parts per million may cause injury. Plants suffering from a lack of this element remain stunted and malformed and eventually blacken and die. Excessive amounts also cause stunting and death. According to Eaton and Wilcox (U.S.D.A. Tech. Bull. 696) boron seems to be universally distributed in soils but may not be present in quantities favorable for plant growth. Deficiencies appear to be most common in regions of high rainfall and injuries owing to excess concentrations frequently occur in arid regions. Irrigation waters are often a source of excess boron. When boron is added to a soil part of it is rendered unavailable by the soil and part remains in solution. The use of lime to reduce boron injury may cause deficiency of boron owing to its reduced concentration in the soil solution while applications of sulphur to reduce alkalinity may increase the concentration to a point where toxicity occurs. These authors state that the use of either lime or sulphur on irrigated soils cannot be generally recommended.

Studies on the distribution of boron in the soils of the state and on its use as a weed killer are under

way at the North Dakota Agricultural Experiment Station.

(E.A.H.)

PROBLEMS OF RURAL YOUTH IN NORTH DAKOTA

The total numbers and the proportion of youth in the population of North Dakota have reached an all-time high in a period when there is no longer any free land, when depression and drouth have greatly reduced the agricultural income of the State and when there is a scarcity of opportunities elsewhere. Lack of jobs and money have delayed marriage, diminished organized social activity and curtailed education among the State's young people.

Information supplied by 2,171 rural youth between the ages of 15 and 29 showed that their particular needs were principally recreational, economic, educational and social, in the order named. In spite of efforts of many organizations and agencies to assist them until the chance to earn an adequate income is available the solution of their other problems will be difficult.

Leadership and guidance is needed to help them realize more fully present opportunities and to assist them in developing temporary expedients until adequate employment and income are available. Whatever action may be taken, the findings of this study constitute a challenge to all who are interested in the present and future welfare of youth and of North Dakota. The youth of today are the mature citizens of tomorrow, and their character and outlook will be colored by the problems they face and the adjustments they make. Hay, Donald G., Greenlaw, James P., and Boyle, Lawrence E., N. Dak. Agri. Exp. Sta., Bul. 293, 1940. (G.L.S.)

A STUDY OF CORN MATURITY

A comparative development of corn varieties and hybrids was studied by the Michigan Experiment Station at East Lansing in 1938 and 1939. The varieties and hybrids using the full growing season as a

rule were yielding highest in grain and fodder. Grain yields at different stages of maturity, and also the shelling percentage, show that corn is not ripe, that is, not through growing, until the grain contains not more than 40 percent of moisture (equivalent to about 45 percent in ears). The maximum yield of fodder or silage was obtained when the corn kernels began to dent (glazing stage) and contained about 50 percent of moisture (equivalent to about 55 percent in ears). The total yield of fodder decreased after the grain had matured fully because some leaves and stalks were lost.

A comparison of designated maturity days of hybrids such as 90-day, 100-day, etc., with the actual maturity based on the moisture content of ears, showed that the moisture content of corn was a more reliable measure of maturity. The recommendations based on these results are as follows.

(1) Adaptability of new varieties or hybrids could best be determined by comparing them with the adapted locally grown varieties. Avoid placing reliance on the superior yields of late corn tested in unusually favorable seasons.

(2) For grain production, choose a variety or hybrid that will use as much as possible of the normal growing season with a reasonable margin of safety to avoid serious losses in unfavorable seasons.

(3) Do not cut corn for grain until the moisture content of the grain falls below 40 percent. At this stage the kernels are thoroughly dented and hard. When the corn is husked and cribbed the moisture content should not be more than 25 to 27 percent. U.S. No. 2 shelled corn shall not exceed 15.5 percent of moisture.

(4) For fodder or silage, choose the most productive variety that will normally reach early dent (soft to medium dough) stage by silo filling or harvest time. At this stage the grain contains 50 to 55 percent of moisture and the stalks about 75 percent. Rather, R. C. and Marston, A. R. Mich. Sta. Quarterly Bul. 22, No. 4, 1940. These recommendations are also applicable to North Dakota. (Wm. W.)