

From the DIRECTOR

A. G. HAZEN



The need for information through research is great and endless. The Experiment Station continuously supplies a flow of information to help meet the demands of the times.

Research is one of the best investments in North Dakota. The return is high — millions of dollars worth of benefits from many single projects. Research benefits to the flax industry alone have paid for the cost of the Experiment Station to the people of North Dakota since the Station was founded.

But North Dakota State University will need increased funds over the next two years for basic research. Increased research effort in nearly all of the administrative units should be considered. This would include more intensive research into the many phases of the use of irrigation waters; hard red winter wheat; specialty crops; animal waste disposal; animal nutrition; plant and animal genetics; pesticides and their effect upon soil bacteria, plants and animals; more fundamental information on insects; woody plant evaluations and tree establishment for beautification, recreation and protection; diseases of plants in the soil; and greater knowledge of the physical properties of our soils and soil moisture. Implementing projects of this kind is a continuous process, and uses all the physical and financial resources available.

The greatest single need for capital improvements for the Experiment Station is for an agricultural science building. Previous requests have been made for this structure, and the request from the 1969 Legislature is for \$1,935,000. Unless physical space is available for offices, laboratories and classrooms, it is very difficult, and becomes quite inefficient, to add personnel, particularly for research.

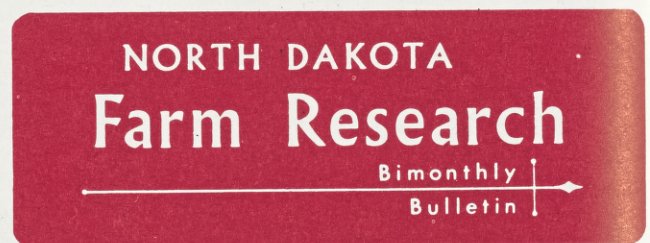
Application of research results helps to increase the dollars of gross farm income in the state. Studies by the Department of Agricultural Economics indicates that each dollar of gross farm income in North Dakota also generates an additional two dollars of volume within the state. Thus, the total dollar benefits from use of research re-

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On The Cover: North Dakota has an abundance of what most tourists want: wide open spaces, scenery, water for fishing and recreation, adequate camping facilities. The state is becoming popular as a vacation area. NDSU's Department of Agricultural Economics has conducted a study of North Dakota tourism. The story appears on page 3.



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in the latter part of May in two separate applications, one in 1963 and the other in 1964.

The nitrogen fertilizer (ammonium nitrate) was applied in a broadcast application in early April in both 1963 and 1964. In 1963, 75 pounds per acre of actual nitrogen was applied and in 1964, 33 pounds of actual nitrogen per acre was applied.

The plots were harvested in August each year after plant growth for the season had been completed. No livestock were allowed to graze in the plot area during the term of the trial.

RESULTS

1963 Herbicide and Fertilizer Application

A summary of weed control, grass injury, and resultant plant composition for each of the herbicide applications is presented in Table 1.

Precipitation in 1963 was above normal, while temperatures were slightly below normal. This combination of precipitation and temperatures was conducive to good plant growth and a good response was obtained from the nitrogen fertilizer.

All of the herbicides used gave excellent weed control at all rates of application. The prairie wild rose was the only undesirable species that was tolerant to the chemicals. Some grass injury occurred at the higher rates of chemical application. The sedges were more susceptible to injury than the grasses.

The grass composition of the plots that received lower herbicide rates gradually decreased in both the fertilized and unfertilized plots during the two year period following the 1963 application. This would indicate that the weed control was not as complete or long lasting at the lower rates. The decrease in grass composition was less on the fertilized plots than on the unfertilized plots. With the better grass growth, after fertilization, weed growth was depressed.

1964 Herbicide and Fertilizer Application

A summary of weed control, grass injury and resultant plant composition for each of the herbicide applications is presented in Table 2.

Weed control in 1964 was less successful than in 1963. Only at the higher rates of application was weed control satisfactory and at these rates the grass injury was high. Precipitation in 1964 was below normal while temperatures were above normal. This could explain in part the lower yields and poorer weed control of the herbicides.

The per cent of grass composition in those plots treated in 1964 reflects the reduced weed control and greater grass injury. The grass percentage in the fertilized plots was generally less than that on the unfertilized plots. During the two year period, grass percentage generally increased during the second year on the fertilized plot, but

on the unfertilized plots the grass percentage generally decreased slightly. This decrease was probably due to a greater amount of weed competition resulting from less vigorous grass growth.

The forage yields from the plots treated with herbicides and fertilizer in 1963 and 1964 are given in Table 3.

The yield results indicate that to obtain the highest grass yields it is necessary to use both fertilizer and herbicides. When fertilizer is used alone, total yield can be increased, but the grass percentage in the forage is reduced. Using a herbicide alone can increase the grass percentage in a pasture but not necessarily forage yield.

SUMMARY

The use of herbicides and fertilizer is an effective method of restoring native pastures. These practices, along with good pasture management and deferred grazing, can increase the grass yields and subsequent carrying capacity of many overgrazed pastures.

The effectiveness of herbicides in controlling weeds can vary from one year to the next. This degree of effectiveness is probably due in a large part to weather.

To obtain the highest forage yields, fertilizer should be used in combination with herbicides. A combination of the two gives grass the greatest boost by elimination of weed competition in conjunction with an increase of available plant food for greater growth. Recommended fertilizer rates should be followed.

Acknowledgement:

The authors are indebted to George Kapusta, former assistant agronomist, for the studies conducted prior to 1964.

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sults become compounding and benefit all citizens in North Dakota.

All the departments in the Agricultural Experiment Station have long and impressive records of contributing to the wealth of the state through agricultural research. To even touch on these attainments and the current and proposed work would require several pages. Part of them have been reported in previous issues of Farm Research.

The departments of the Agricultural Experiment Station cooperate with each other and with the USDA in many projects, increasing the dollar-value efficiency of research at NDSU through team research. The facilities and personnel of the six branch research stations and the Agronomy Seed Farm at Casselton also play an important role in the total research program of North Dakota State University.