

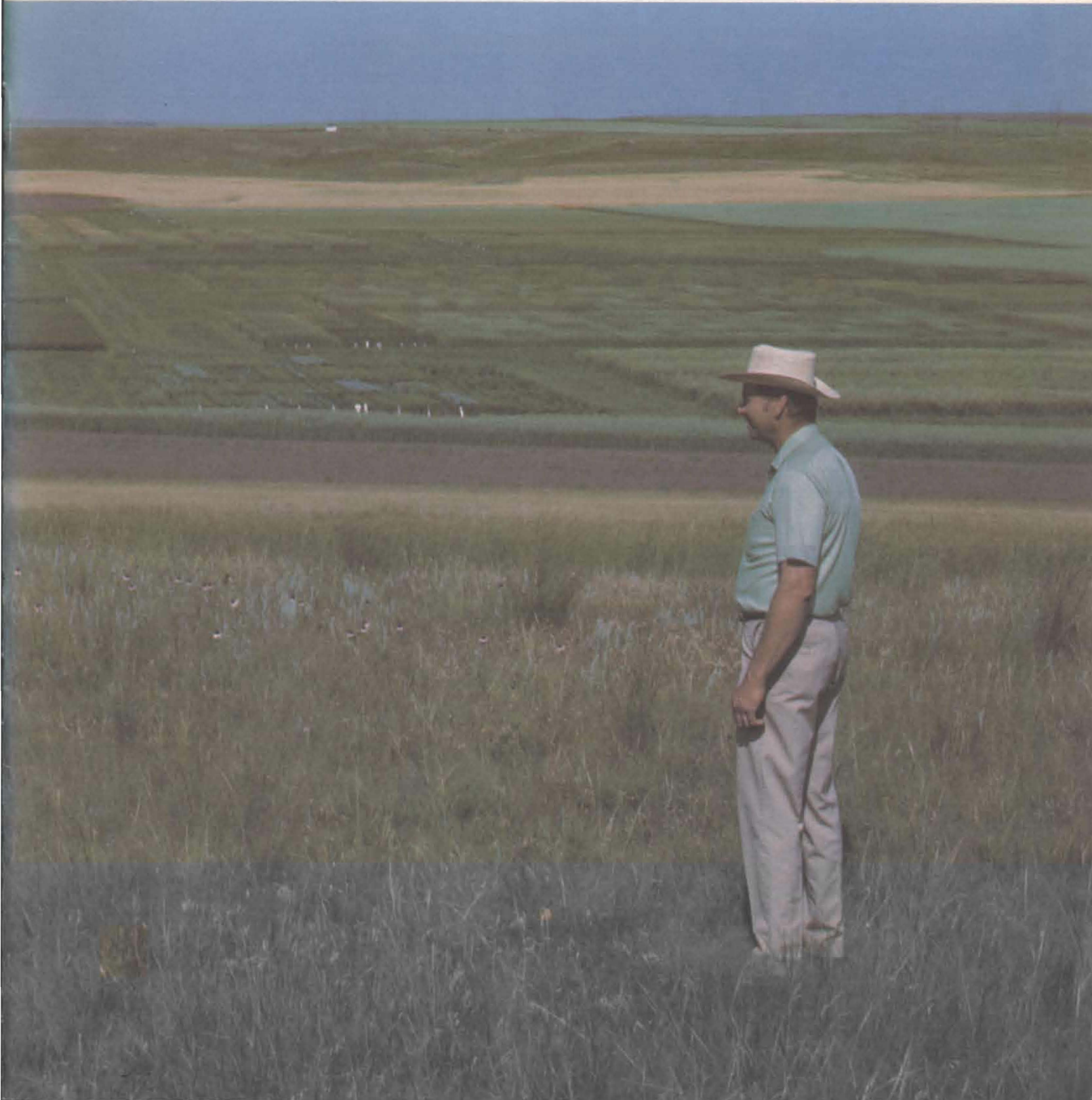


NORTH DAKOTA
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Guest Column

Ernest French
Superintendent
Williston
Experiment Station



The Branch Station is a unique part of the North Dakota Agricultural Experiment. It serves not only as part of the broad research program conducted by the Experiment Station, but also serves the needs of agriculture in the areas in which it is located. Each station conducts research trials which are specifically designed to meet the needs of the farmers in that particular area.

The Williston station is located in the area of North Dakota where rainfall is generally the limiting factor for crop production. Summer fallowing is a widely accepted practice for increasing crop yields. Recropping or second cropping is a practice that is generally done only in years of good fall or early spring rains and even then on a limited acreage. These two practices, summer fallowing and recropping, one widely used, the other used on a limited basis, are a principal part of the research program conducted at the station.

Summer fallowing is used to increase moisture available for a crop. This added moisture helps to increase crop yields and tends to stabilize crop production from year to year. Fallow also increases nitrogen in the soil by stimulating microbial activity to convert organic material to nitrogen for use by the plant. However, the benefits that are derived from summer fallowing are offset by a number of problems that are associated with the practice. Soil erosion is perhaps the most serious problem created by fallow. Unless properly and carefully managed, the tillage operations to control the weed growth will bury crop residues and leave the land susceptible to wind and water erosion. Summer fallowing is the main contributor to the saline seep problem that has affected thousands of acres in western North Dakota. The short term gain of nitrogen in the fallow is offset by a long term decline in total organic matter in the soil which is necessary for good tilth, structure, and water holding capability. In spite of these problems, summer fallowing will probably continue to be practiced because it helps to increase the amount of moisture available for crop production.

Studies are being conducted at this station to find other practices that can be used to more effectively utilize all the moisture that is received

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On the Cover: Pictured is Ernest French, superintendent of the Williston Branch Experiment Station. In this issue French comments on the branch station comment and ongoing work at Williston. Photo by James Berg.

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BULK THIRD-CLASS

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Guest Column continued

during the year or to use the stored moisture more efficiently and to become less dependent on summerfallow. These practices include reduced tillage operation on fallow and for seedbed preparation. The use of chemicals for controlling weeds on fallow, no till seeding, and more effective use of fertilizer and herbicides. One source of moisture that is not being fully utilized is snow. Although snow varies in amount from year to year, if held in place on the fields, it could become a valuable source of moisture. The most effective way to retain snow for soil moisture is to leave stubble standing in the field. Studies in Saskatchewan, Canada show that the additional moisture available for soil storage with standing stubble tends to reduce the drought risk of continuous cropping in west-central Saskatchewan. Their research also indicates that extended rotations would convert more annual precipitation to crop growth, and reduce the amount lost through evaporation and percolation through the soil profile. By reducing such moisture losses the spread of saline seeps should be reduced.

More efficient use of stored soil moisture and seasonal precipitation means that more intensive cropping practices could be used. Studies are being conducted at the Station to find practices that will give more consistent and higher yields under intensive cropping. To aid in improving soil productivity and maintaining soil organic material, forage crops should be included in a cropping

system. A legume such as alfalfa, when properly inoculated, will add nitrogen and organic matter to the soil.

Research has shown that for successful recropping it is necessary to use different crops. This will help to minimize plant diseases and allow the use of various herbicides for the control of weeds. The rooting pattern of various crops can be used as a means of more effectively utilizing stored soil moisture. Another advantage of using different crops is that more effective use can be made of labor and machinery by using crops that have different planting and harvest dates.

More intensive cropping or the use of extended crop rotation in western North Dakota does involve risk. However, the wise use of moisture, tillage machinery, modern technology and a flexible cropping system can make it an acceptable practice. Reducing the use of summerfallow and increasing the use of soil building crops and cropping systems, would strengthen western North Dakota agriculture. Better land utilization can be accomplished by using the best land for more intensive cropping; by maintaining and improving the marginal lands through the use of extended rotations that include forage crops; and by returning to grass some of the poorer land that would be best utilized as pasture. Our soil is a valuable resource and it can be kept productive through good management practices.