

in 1935 that "the value of summer fallow as insurance against crop failure has been further emphasized during the past three extremely dry seasons."

Experimental work that was to foreshadow our present methods of sub-surface tillage and trashy fallow began to yield positive results, and in 1931 it was reported that "the introduction of plowless (duckfoot) fallow has lowered the cost of fallow 40 to 65 per cent."

Grasses, Forage Crops

In addition to research on cereal varieties and tillage methods, work done at Moccasin on introduced grasses and forage crops has made a major contribution to Montana's livestock industry. They were the second station in the U.S. to make studies of crested wheatgrass. Work begun in 1915 has led to the development of a highly nutritious grass that greens up early in the season when it is most needed by cows and ewes for milk production. Russian wildrye was first tested in the U.S. at Moccasin in 1928, and has given stockmen an excellent, drought resistant grass for late grazing to supplement the earlier crested wheatgrass.

Just as new developments in farm machinery have revolutionized agriculture, greatly increasing crop production in recent years, so has the introduction of new machinery especially designed for experimental work increased the amount of research that can be carried on. The present staff at Moccasin consists of two researchers, Krall and Art Dubbs, assistant in agronomy; Dora Barrick, clerk; two permanent field workers, Jess Ellis and Raymond Krumheuer, and three temporary helpers employed for the summer. During the 1920's the station had a staff of five researchers and 20 permanent workers. Krall says that today with their small staff they are able to do five times as much research as in the 20's.

Special Implements

A six-row seeder, special harvesting implements, a small threshing machine and a seed cleaner, all developed at the station for handling the small 20-foot plots has made this possible. The work of compiling and evaluating the mountains of data would be almost impossible with so small a staff if it wasn't for the calculating machine in the office.

When you tour the experimental plots at the Golden Anniversary celebration you'll see 1,207 different varieties of winter wheat seeded on 2,824 different plots; 2,309 spring wheat varieties on 3,415 plots; 72 varieties of oats on 240 plots; 107 barley varieties on 538 plots, and 6 varieties of corn on 54 different plots. That's a staggering total of 3,701 varieties of grain on 7,071 plots. In addition, there are plantings of forage crops, shelterbelts, garden crops and ornamental plants.

Research Information

Why so many different varieties seeded on so many plots? Soil variations on the station, a situation common to most dryland farming areas in the state, make it necessary to plant each variety on several locations so an average can be taken to determine the yield. Winter wheat varieties from Kansas, Oklahoma, Nebraska, South Dakota and other winter wheat states are being tested at Moccasin to determine their winter hardiness and adaptability to Montana conditions. They're testing various strains and crosses in an effort to develop a solid stemmed winter wheat for the sawfly areas. New varieties and crosses from the breeding laboratories are being tested for milling and baking qualities and adaptability. They're looking for

strains resistant to dwarf smut and wheat streak mosaic.

New barley crosses are being tested, and there is promise of finding a higher yielding variety than Compana with taller straw.

Oats, Corn Varieties

They're looking for strains of oats that are more resistant to shattering. Early, medium and late maturing hybrid corn is being raised to obtain data on dryland forage production.

In fertilizer trials various combinations and rates of application are studied. Herbicides for weed control and chemical fallow are being tested. Response to various tillage methods are under observation. To develop a good dryland pasture mixture, 17 varieties of grass are being clipped every 15 days and analyzed for protein content at various stages of maturity. Cereals are being seeded in wide rows and cultivated like corn, the hope being to find a method of handling the soils in central Montana that would more ef-



"Guess who I ran into today."

fectively and efficiently deal with the problems of wind erosion than the present strip cropping and trashy fallow methods.

Stable, Prosperous

Much of Montana was first settled by people from the heavy soil regions of the United States where rainfall is more plentiful than here. The many abandoned quarter and half-section farmsteads of that early era are stark evidence of the complete lack of knowledge about the area that existed at that time. Through research carried out at the Central Montana Branch Station during the past 50 years, we have learned how to deal successfully with the soil and moisture conditions. With research has come a stable and prospering agriculture.

What about the future? In a summary report highlighting the history of the station, Superintendent Jim Krall said, "Basing judgment on past and present research at this station, and the fact that we are now in a period of overproduction, it appears that any future research should be more basic in nature. In other words, we should try to glean information that will be of considerable value 20 or 30 years from now."

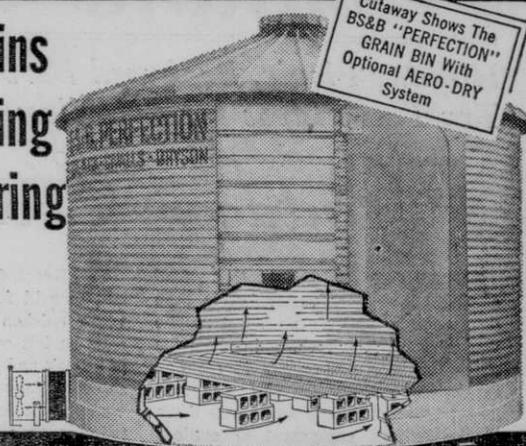
"The problem of winter killing has plagued this area since the introduction of winter wheat. Any research on this problem should be exceptionally fruitful. Since water is our limiting factor for production, any studies designed to reduce evaporation would help increase production when needed. Any studies in the field of genetics cannot be over-emphasized. In spite of the fact that summer fallow is an insurance against drought, it has its limitations since it creates an erosion hazard. The development of any practice or practices which would equal or better the summer fallow system should be studied.

"A study of our climate in relation to plant growth warrants attention. Perhaps it may be possible to more accurately predict what variety to grow, what fertilizer to apply, or what practice to follow.

"Any suggestions on future research would be appreciated. All progress starts with a single idea."

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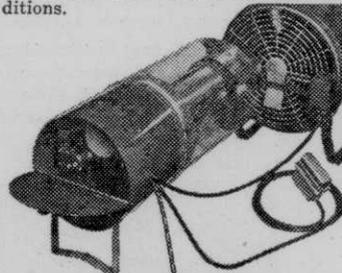
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