

Seedstocks: THE MULTIMILLION DOLLAR CONNECTION

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The Seedstocks Project in the Department of Agronomy at North Dakota State University is considered one of the outstanding agencies of its kind in the United States.

The current season marks 22 years of operation, and cooperation with other departments such as the Departments of Plant Pathology and Cereal Chemistry and Technology, the Agronomy Seed Farm, Branch Experiment Stations, county and state Crop Improvement Associations, the State Seed Department, the North Dakota Agricultural Association, the North Dakota Seed trade and other agricultural organizations.

During the 22-year period, the associations have produced over 10 million bushels of new varieties of seeds. This has given participating increase growers an estimated income of \$20.8 million in addition to receiving the economic benefits of higher yields and better quality products.

Especially since 1960, the rapid southern winter increase and the accelerated summer increase of new varieties in the seedstocks program in North Dakota has brought millions of dollars of new wealth to the state's farmers and provided significant financial support to

several Branch Experiment Stations. The rapid increase system has placed new varieties on farms one or two years earlier than would be possible otherwise.

Hard red spring wheat is the most important agricultural commodity produced in North Dakota. The NDSU-developed superior varieties such as Olaf, Butte and Len are estimated to have added \$68 million new wealth in 1978-79 in addition to the income which would have been produced for the farmer by the next older variety. That figure is 2.7 times the entire budget of the North Dakota Agricultural Experiment Station and all the Branch Stations for that biennium. The cost-benefit ratio of NDSU research on hard red spring wheat is estimated at 100:1 for North Dakota benefits alone.

Durum ranks second in important and value as a cash crop. Calvin and Cando durum were the first semidwarf durums produced in North America with high grain quality. Edmore and Vic were the first U.S. durums with high gluten strength desired by some European importers as well as useful to U.S. processors. New durum varieties in use from 1973-78 added \$80 million to the income of durum producers when compared to the older varieties available at the time.

Superior malting barley varieties developed at NDSU have occupied almost 100 percent of the barley acreage in the state and most of Minnesota and South Dakota for many years. New superior varieties of malting barley have provided added value above the next best variety of about \$11 million per year over recent years.

Two-rowed barley for North Dakota is being developed as a potentially new crop having a conservative North Dakota farm value of up to \$100 million annually. New two-rowed barley experimentals are equal to six-rowed checks in agronomic performance and disease resistance. Malting characteristics are satisfactory with the exception of protein content, which consistently has been too high in the past. Kernel plumpness of some two-rowed experimentals has been consistently high over a wide range of environments.

Sunflower acreage and production in the state is rapidly becoming a competitor for second place in crop income. Based on 1980 figures, the 2.5 million acres of sunflower with an average yield of 1,000 pounds per



Dr. LeRoy Spilde, newly-appointed project leader for the NDSU Seedstocks Project, admires a few heads of a potential winter wheat line under increase at the Agronomy Seed Farm.

acre and a value of 10 cents per pound, the value was \$250 million. The USDA and NDSU cooperative breeding programs have produced most of the superior disease resistant and productive sunflower inbreds used in hybrid sunflower production in this region. If hybrids produce 200 pounds more per acre than open pollinated varieties that might have been grown in the state, the research benefit would have added \$20 per acre or \$50 million to the sunflower crop value in 1980 alone.

The Fish and Wildlife Service, in their last evaluation, placed sunflower losses to birds at 1.2 percent of the crop in North Dakota and Minnesota, about 12 pounds per acre overall. Birds accounted for over 40 million pounds of seed in 1979 when 3.4 million acres were harvested. With oilseed prices at 10 cents per pound, North Dakota farmers lost about \$4 million. The bird

resistance program is budgeted at about 1 percent of the estimated annual loss of sunflower seed to birds.

Inbred lines with bird resistance can be incorporated into hybrid breeding programs. Additional studies are being performed to identify physical or chemical characteristics of sunflower that could provide resistance to bird attack.

The Seedstocks Project also is initiating research into production of dry edible bean seed in western North Dakota as a means of replacing the need for increase fields in Colorado, Idaho and Washington. If this research is successful, the savings to dry bean producers in terms of seed costs could be in the range of \$2 to \$3 million per year in addition to increased incomes from the sale of seed.

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The northern plains region has a whole lot of agricultural produce to offer, but for every crop raised on the northern plains which may interest a prospective customer, there is a competitive or alternative crop raised somewhere else that might interest him instead. North Dakota raises wheat, but so do Canada and Argentina and Brazil — and at the moment Canada can offer lower freight rates than the U.S., most countries have more favorable exchange rates than the U.S., and a good many countries have come to enjoy reputations as more reliable commodity suppliers than the U.S. All this means that it is more important than ever for North Dakota region producers to be certain that prospective buyers fully understand the advantages of purchasing high-quality products of the northern plains.

In offering educational programs, the Northern Crops Institute will work closely with the Foreign Agricultural Service of the USDA through U.S. Wheat Associates, a promotional organization with offices in Chile, China, Egypt, Holland, Hong Kong, India, Japan, Korea, Mexico, Morocco, Philippines, Singapore and Taiwan. U.S. Wheat Associates is supported by commodity groups in North Dakota and twelve other

states. Donnelly expects to use its vast network to make initial contact with a number of the trade teams that will come to Fargo for training. Because wheat is the best-known crop of the northern plains, it is a very good starting point for introducing the world to other crops of the region. Later, the Institute hopes to work with market development organizations such as the U.S. Feed Grains Council.

Donnelly is optimistic about what the Northern Crops Institute will accomplish for agriculture in North Dakota, Minnesota, Montana and South Dakota over the long term. He gets a little nervous, however, when anyone suggests that the Institute is going to turn up quick bucks for northern plains farmers. Education does not turn up quick bucks. It isn't a quick fix.

“Running a crops institute,” says Donnelly, “is rather like running a farm. You cultivate, you sow, you wait. Maybe you make money the first year and maybe you don't. But if you do the job right, you expect to come out ahead over the long haul. We intend to do a good job of informing the world about northern crops, and in the long run we expect this to pay off.”

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Weiser hopes to set up tests this winter in which he can grind bean flour, inoculate it with bacteria and measure the gas produced. The information gained may be specific enough that he can then select bean lines and

modify through plant genetics. And of all the work done with flatulence in the past, none has been done from the plant genetics standpoint.