

Biennial Report, 1965-67

THE AGRONOMY SEED FARM

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There is no shortcut to developing new and acceptable varieties of crops. The developing of the new and acceptable variety is the responsibility of the plant breeder. In North Dakota the responsibility of increasing new varieties and maintaining old desired ones rests with the Seed Stocks Project of North Dakota State University. The responsibility of the Agronomy Seed Farm is to assist the increase of new varieties and share in maintaining foundation seed of the desired older ones. Usually the Agronomy Seed Farm, through the Seed Stocks Project, makes the initial increase even when southern increases also are utilized.

This report concerns operations of the Agronomy Seed Farm from July 1, 1965 to June 30, 1967. However, some elaboration is necessary

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to put the matter of seed increase at the Seed Farm in proper perspective with variety development and release.

The Agronomy Seed Farm produces only those varieties that the Seed Stocks Project suggests for increase. The project consults North Dakota State University and USDA plant breeders concerning breeding stock of new varieties originating in North Dakota and breeding stock of acceptable varieties released in other states and in Canada by public breeders. In this way, the North Dakota farmer is assured of having available to him varieties of known quality and performance.

Approximately 40,000 bushels of high quality Foundation and Registered small grain seed was produced and sold by the Agronomy Seed Farm during this reporting period. Most of this seed was produced in 1965 and 1966. Total production

Table 1. Progress of new varieties with initial North Dakota increases at the Agronomy Seed Farm.

	1963		1964		1965		1966		1967 Spring Acres (estimated)
	Spring Bu.	Fall Bu.	Spring Bu.	Fall Bu.	Spring Bu.	Fall Bu.	Spring Bu.	Fall Bu.	
Chris wheat	+2½	100	100	2400	2400	65,000	65,000	1.5 Mil.	1.5 Mil./
Dickson barley		2	176*	5700	5700	260,000	260,000	8-10 Mil.	57% of N. D. barley acres/
Conquest barley					+50	2,018		No information	
Traverse soybeans					+20	400		No information	
Hume winter wheat				+3	3	50	50	2,500	2,500
Manitou wheat					+30	714	1,100	25,000	37,000
Fortuna wheat			½	15	15	490	490	8,480	8,480
Leeds durum					3	130	1,700*	43,000	56,000**
Tyler oats					1	75	75	3,300	1,400
Harmon oats					+1	40	40	1,500	750
Dawn oats					2	90	90	2,700	1,350
Wyndmere oats					3	160	160	5,600	2,800
Kelsey oats									+30
Sioux oats									+30
Portal oats									+50
Holden oats									+50
Altona soybeans									+20
Noralta flax					+1	30	30	Hailed out	+40
Dawson alfalfa									+10

+ Purchased from states or province releasing the variety.

* Additional increase through southern crop.

** Additional bushels from other sources.

/ 1966 Chris and Dickson production based on average production of respective crops in the state. Since these two varieties yielded better than other varieties, estimates are conservative, rather than exaggerated.

would have been substantially greater but for a devastating hail storm on July 25, 1966.

In this same period about 14,000 pounds of grass and legume seeds, either produced at the Agronomy Seed Farm or obtained from the National Foundation Seed Project, were sold in North Dakota.

To merit Foundation or Registered class, seed must have high purity and kernel weight, good germination, and be essentially free of weed seeds and admixtures. In addition, the 39 varieties of small grains, grasses and legumes produced during this report period had the high qualities de-

Table 2. Sale of Breeders, Foundation and Registered seed by the Agronomy Seed Farm, Casselton, N. Dak., July 1, 1965 to June 30, 1967

Crop	Variety	1965-66	1966-67	
Wheat	Chris	7674 bu.	1078 bu.	
	Justin	987 bu.	291 bu.	
	Manitou	210 bu.	640 bu.	
	Sheridan	213 bu.		
	Crim	88 bu.		
	Hume	44 bu.	74 bu.	
	Fortuna	21 bu.	218 bu.	
Durum	Wells	1245 bu.		
	Leeds	60 bu.	2220 bu.	
	Lakota	10 bu.		
Barley	Dickson	6298 bu.	1034 bu.	
	Conquest	950 bu.		
	Larker	1381 bu.	66 bu.	
	Trophy	7 bu.		
Rye	Caribou	100 bu.	191 bu.	
	Antelope	2 bu.	178 bu.	
Flax	Windom	302 bu.	40 bu.	
	Bolley	532 bu.		
	Summit	283 bu.		
Oats	Dawn	194 bu.	2575 bu.	
	Wyndmere	182 bu.	4325 bu.	
	Harmon	45 bu.	1523 bu.	
	Lodi	45 bu.		
	Brave	99 bu.		
	Tyler	67 bu.	2464 bu.	
	Holden*		90 bu.	
	Sioux*		60 bu.	
	Portal*		97 bu.	
Kelsey*		60 bu.		
Soybeans	Traverse	400 bu.	250 bu.	
	Portage	100 bu.		
Grasses	Empire birdsfoot trefoil**	230 lb.	30 lb.	
	Climax timothy**	470 lb.		
	Vernal alfalfa**	240 lb.		
	Lakeland red clover**	250 lb.	540 lb.	
	Crested wheatgrass	3560 lb.	710 lb.	
	Vinall Wildrye	320 lb.		
	Denta Sweetclover	125 lb.		
	Millet	Turghai	4300 lb.	3250 lb.

*For contract increases.

**Sale to growers from National Foundation Seed Stocks. The seed was purchased by the Agronomy Seed Farm and resold to growers at cost plus transportation.

manded by growers and the consuming public: namely, good agronomic characteristics, along with the characteristics demanded by millers, bakers, maltsters and feeders.

Developing A New Variety For Increase

To get the combination of high inherent quality that industry wants and the top field performance farmers need, the plant breeding team, whether at North Dakota State University, in other states, or with a private seed company, must follow a carefully planned development procedure requiring several years.

First, the plant breeder must make a cross wherein each of the parents has some of the characteristics needed or desired. About seven years of breeding and comparative field trials usually are needed to determine whether or not progeny from the cross are superior and merit further testing for the quality that industry and ultimately the consumer desires. Usually the quality tests require three or more years.

Thus, before the Agronomy Seed Farm can make an increase of a potential or newly released variety, a minimum of seven to 10 years are required in developing and testing. A good example is the new durum variety, Leeds. The cross was made in 1957. The first seed increase was in 1965, eight years after the original cross was made. The sequence and time lapse is similar for Dickson barley and Fortuna wheat. Once the variety is released, however, increase is made as rapidly as possible. Leeds durum was increased from three bushels in the spring of 1965 to about 1¼ million bushels in the fall of 1967. The Agronomy Seed Farm is usually the location of the first increase; even when southern increases also are included. Table 1 shows how rapidly several new varieties have increased in recent years.

Production Practices

To make the maximum increase each year the Agronomy Seed Farm now fertilizes heavily in the fall followed by a starter application in the spring. Fall plowing is done early and soybeans have replaced summerfallow in the rotation.

In 1965, 90 acres were in summerfallow compared with 56 acres in 1966. No acreage was left for summerfallow in the spring of 1967.

New methods and chemicals are being used to control weeds in soybeans, flax and alfalfa as well as fungicides to control diseases in cereal grains. A new chemical, Vit-A-Vax, applied to seed barley provided good control of loose smut in the spring of 1967.

To assure good increase of new varieties and to maintain purity in small grains, some seeding is done in 30-inch rows as pictured below. Rotations are planned carefully to avoid crop mixtures that result from recurring "volunteer" plants. Finally,



This plot of Sioux oats, a newly-released Canadian variety, is planted in 30-inch rows for increase of a seed source at the Agronomy Seed Farm.

good harvesting and cleaning equipment is used correctly and carefully.

Increase Of New Varieties

A new variety of wheat or other small grain crop produced at North Dakota State University is increased rapidly once the breeder provides the pure original lot of Breeders seed. The increase proceeds through the generations of increase cal-

led Breeders, Foundation and Registered at the Agronomy Seed Farm, at branch stations, or possibly by winter increase in Mexico or Arizona. Farmer seed growers produce Registered or Certified No. 1 and Certified No. 2 from seed classes of higher generation. For example, Registered seed is harvested from a field seeded with Foundation seed, and Certified No. 1 from a Registered field. Foundation seeds of new crops often are obtained from other states or Canada and increased under the same system for use by North Dakota farmers.

During the past two years, 1965-67, the Agronomy Seed Farm has produced or purchased for increase and sale 39 varieties of 15 different crops (Table 2). Small increases of potential new varieties are not included in the list.

Of the foregoing list of 39 varieties, 17 are new. Three other new varieties, Altona soybeans, Noralta flax, and Dawson alfalfa, were planted in the spring of 1967 but not reported as produced or sold. Thus, 20 new varieties were grown during the report period when 42 varieties were in production.

Seed Prices

The price of Foundation and Registered seeds sold by the Agronomy Seed Farm is set by the Seed Stocks Project. Prices are kept as reasonable as possible. The income from seed produced on the Agronomy Seed Farm is used to maintain and improve the farm, which is a completely self-

Table 3. Agronomy Seed Farm account as provided by Office of the Director, North Dakota Agricultural Experiment Station, Fargo, July 1, 1965 to June 30, 1967.

	July 1, 1965 June 30, 1966	July 1, 1966 June 30, 1967
Assets:		
Balance on hand July 1	\$40,846.96	\$63,377.49
Income from farm:		
Seed and misc. grain	\$78,878.94	\$52,904.31
Other miscellaneous	6,449.92	8,934.39*
	\$85,328.86	\$61,838.70
Total	\$126,175.82	\$125,216.19
Expenditures:		
Farm operations	\$41,436.14	\$52,586.73
Machinery and equipment	9,354.74	7,215.00
Contract seed growing	12,007.45	5,445.00
All farm operations	\$62,798.33	\$65,246.73
Permanent improvements:		
New residence		\$20,564.00
Miscellaneous		1,296.00
		\$21,860.00
Total expenditures	\$62,798.33	\$87,106.73
Balance on hand July 1	\$63,377.49	\$38,109.46

*Includes \$7,515 hail adjustment on 1966 crop and buildings.

supporting unit that does not receive appropriations from the Legislature.

Improvements

During the report period a new dwelling was erected, buildings were painted and the following items of equipment purchased:

2-ton truck	Melroe harrow
14-foot swather	Water tank
Seed treater	Combine
Grain auger	Small snow plow blade

The financial report for the report period July 1, 1965 to July 1, 1967 is shown in Table 3.

Future Plans and Council Members

Future plans include an additional warehouse, grain drying facilities and a larger gravity mill. Seed sales of the Agronomy Seed Farm also reflect production from a small acreage of the Dalrymple Experimental Farm. This income is used to defray land improvement costs and farming operations that Superintendent Mark Jendro supervises and performs for project leaders of experimental work there.

On July 19, 1967, the Agronomy Seed Farm Council met for its regular biennial meeting. The farmer members of this Council are appointed for six-year terms by the Director of the Agricultural Experiment Station. They receive no compensation for this service. Council members are as follows:

Terms expiring in 1967

Edward F. Manthei, Leonard
A. H. Berg, Wyndmere
Harold R. Hanson, New England
Orris Nordhaugen, Leeds

Terms expiring in 1969

Ernest Dixon, Fortuna
John Withers, Mandan
Lyle Dawson, Jr., Fort Rice
Frederick Wolhowe, Verendrye

Terms expiring in 1971

Leon Peters, Jamestown
Jerome Nesvig, Buxton
Jack Wilkinson, Montpelier
Daryl Anderson, Reeder

Representing the North Dakota Crop Improvement Association

Herb Goerger, Mandador

Representing North Dakota Seed Trade Association

Otto Klindsworth, Carrington

Commissioner of Agriculture and Labor

Arne Dahl

State Seed Commissioner

R. C. Hastings

Extension Agronomist

Lars Jensen

A Local Farmer

George Howe, Jr.

Chairman, Department of Agronomy

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NORTH DAKOTA STATE UNIVERSITY
of Agriculture and Applied Science
University Station
Fargo, North Dakota 58102
Publication



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