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G80-487 Spring Small Grains Variety Selection (Revised January 1992)

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Moomaw, Russell; Nelson, Lenis Alton; Baltensperger, David D.; and Hammons, Roger, "G80-487 Spring Small Grains Variety Selection (Revised January 1992)" (1980). *Historical Materials from University of Nebraska-Lincoln Extension*. 759.

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Spring Small Grains Variety Selection

Tests indicate which varieties of oats, barley and spring wheat are best adapted to Nebraska growing conditions.

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The primary spring small grain grown in Nebraska is oats. Oats are grown throughout the state, but production is concentrated in the east and northeast cropping districts. Nebraska's estimated harvested oat acreage in 1989 was 310,000 acres.

Spring barley production is centered in the northwest and southwest districts. Harvested barley acreage in 1990 was 30,000 acres. Barley is commonly grown as an early summer feed grain and corn substitute.

Spring wheat production in Nebraska is concentrated in the northern section of the state where conditions limit reliability of winter wheat.

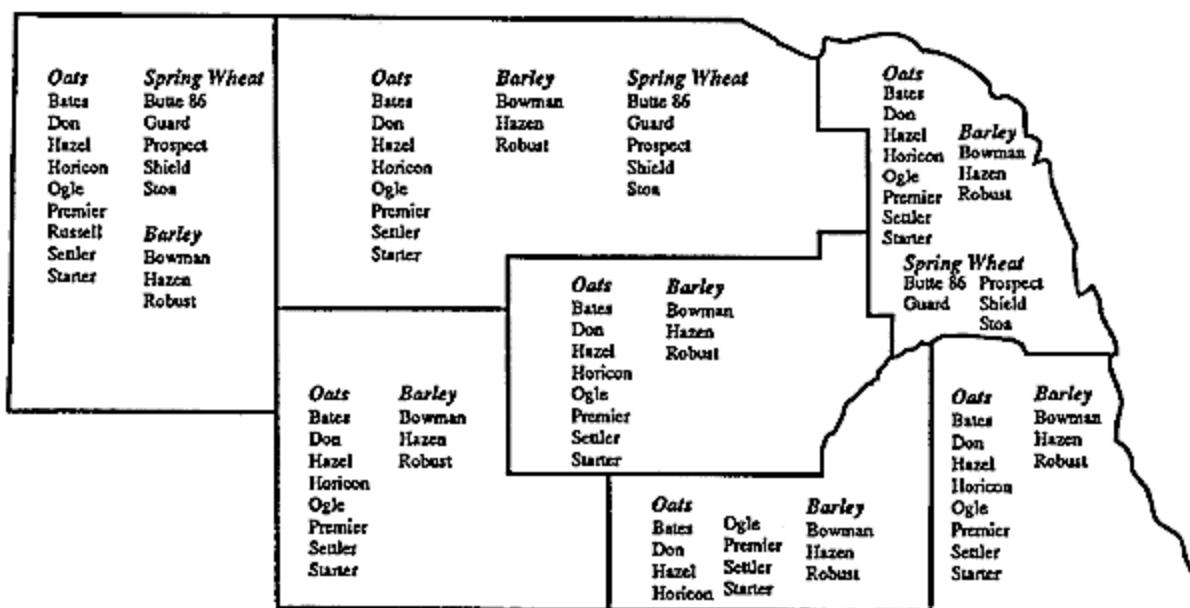


Figure 1. Adapted oat, barley, and spring wheat varieties for Nebraska.

The University of Nebraska Agricultural Research Division does not have a breeding program to develop new spring small grain varieties; however, new varieties developed by other Midwestern states and seed companies are tested each year at several Nebraska locations. From this evaluation program, the varieties best adapted for use in Nebraska are identified (*Figure 1*).

Oat Variety Selection for Grain

Oat producers should think about potential markets when selecting a variety. About 9 percent of oats produced are processed for human food. There are rigid specifications for milling quality oats. Test weight is critical with price discounts from 38 lb/bu down to 34 lb/bu and premiums offered for oats over 38 lb/bu. Grain color is not critical for milling oats. Sound cultivated oats (SCO) is an official grading factor. Sound oats are kernels which are not badly ground or weather damaged, diseased, insect bored, damaged by frost, heat or mold, or otherwise materially damaged. Milling quality oats must have 95.5 percent SCO kernels with price discounts down to 94 percent and premiums offered for 98 percent and higher SCO.

Another specialized market for oats is the race horse industry. A large, white-kerneled oat with minimum test weight of 38 lb/bu usually is specified. Some varieties popular with race horse feed processors are Don, Hytest, Kelly, and Nodaway 70. Oat varieties that have the best characteristics for the race horse market do not always give the best yield.

About 85 percent of oat production is used for livestock feed. Factors to consider when selecting an oat variety are yield potential, test weight, maturity, straw strength, and disease resistance. *Table 1* shows characteristics of oat varieties tested recently in Nebraska. Early or medium maturity varieties are most widely adapted for grain production. Some late maturing varieties have done well in the Panhandle with irrigation and across northern Nebraska where average temperatures are cooler.

Although oats are attacked by many disease-causing organisms, oat production in Nebraska is not affected by disease as much as that in adjoining states. Barley Yellow Dwarf Virus (BYDV) is a very destructive oat disease. Incidence of this virus has been more frequent and severe in recent years. See

Table I for information on varieties with resistance to the Barley Yellow Dwarf Virus. NebGuide G89-906, *Barley Yellow Dwarf Disease of Barley, Oats and Wheat* contains detailed information on this virus. Incidence of leaf rust is highly variable by year, but it is usually not a severe, limiting factor in oat yield. Control smut and seedling blights of spring small grains with seed treatment.

Table I. Characteristics of some oat varieties in recent Nebraska tests.												
			Agronomic characteristics						Disease resistance ^a			
Variety	Origin	Year released	Maturity	Straw strength	Height	Grain color	Test weight	Protein	BYDV	Smut	Stem rust	Crown rust
Bates	Missouri	1977	Early	Very good	Short	Dark	Very good	Medium	R	MR	S	MS
Burnett	Iowa	1956	Medium	Fair	Med-tall	Ivory	Good	Medium	S	MR	S	S
Don	Illinois	1986	Early	Good	Short	White	Good	Medium	MR	R	MS	R
Ensiler ^b	Wisconsin	1990	Late	Good	Tall	White	Low	--	MR	R	S	MR
Hazel	Illinois	1986	Medium	Very good	Short	Gray	Good	Medium	R	S	S	MS
Horicon ^{bc}	Wisconsin	1990	Medium	Good	Medium	Tan	Fair	Medium	MR	MS	S	MR
Hyttest	South Dakota	1986	Medium	Good	Tall	Lt. cream	Very good	High	S	MR	MS	MS
Kelly	South Dakota	1984	Early	Fair	Medium	White	Very good	Med-high	S	MR	MS	MS
Newdak ^c	North Dakota	1990	Medium	Good	Medium	White	Fair	Med-low	MR	--	MR	MS
Ogle	Illinois	1981	Medium	Good	Medium	Yellow	Fair	Medium	MR	MS	S	MS
Premier ^c	Minnesota	1990	Medium	Good	Medium	Yellow	Very good	Medium	MR	MR	MS	MS
Russell	Canada	1960	Late	Good	Tall	White	Fair	Medium	S	R	S	MR
Settler	South Dakota	1990	Medium	Fair	Med-tall	White	Good	High	MR	MR	S	MR
Starter ^c	Minnesota	1986	Early	Very good	Medium	Yellow	Very good	Medium	MR	R	S	S
^a S = Susceptible; MS = Moderately susceptible; MR = Moderately resistant; R = Resistant. ^b Must be sold under a licensing agreement. ^c U.S. Protected Variety. Seed may be legally sold by variety name only when produced and labeled as certified seed, according to the provisions of the U.S. Plant Variety Protection Act.												

Variety Description

Oat varieties adapted for grain and forage production in Nebraska are shown in *Figure 1*. Detailed grain yield and performance data are given in the *Nebraska Spring Small Grain Variety Tests, EC 91-102*, available at county extension offices.

Bates

This variety was developed in Missouri and released jointly with the University of Nebraska Agricultural Experiment Station in 1977. It is an early, short-statured variety with good lodging resistance and high test weight. Bates has an excellent yield record in Nebraska. Bates has good overall disease resistance, with very good resistance to the Barley Yellow Dwarf Virus.

Burnett

Burnett is a medium maturity oat of medium height with only fair straw strength. Burnett is susceptible to Barley Yellow Dwarf Virus, which results in low oat yields when the incidence of this disease is high. Burnett has good tolerance to heat and drought stress. It has ivory kernels with good test weight.

Don

Don is an early maturing, short-statured variety with good straw strength. Don has whitekerneled grain, good test weight, and better than average disease resistance. It has good yield stability over a wide range of growing conditions.

Hazel

Hazel is a medium-early variety with good straw strength, short height, and good yield stability. Hazel has gray colored grain with good straw strength. Hazel has resistance to crown rust and Barley Yellow Dwarf Virus.

Horicon

Horicon is a medium maturity oat with medium-tall height. Horicon has tan to yellow kernels. Yield potential is good but test weight tends to be medium-low. Horicon is moderately resistant to the Barley Yellow Dwarf Virus and crown rust but is susceptible to stem rust. Horicon was released under the Plant Variety Protection Act and must be sold through a licensing agreement with Wisconsin.

Ogle

Ogle is widely adapted in Nebraska and has an outstanding yield record. Ogle is of medium maturity, medium short height, and good straw strength. Kernel color is yellow, but test weight is good to fair.

Premier

Premier is a medium-early, medium height variety with good straw strength. Yellow grain is plump with high test weight and high milling yield. Premier has moderate resistance to the Barley Yellow Dwarf Virus and smut but is moderately susceptible to crown rust and stem rust. Premier carries Plant Variety Protection.

Settler

Settler is a mid-season variety with medium height. Settler's resistance to Barley Yellow Dwarf Virus is better than earlier South Dakota releases. Settler is moderately resistant to crown rust but susceptible to stem rust. It has white kernels with good milling yield and medium test weight. Settler has a tendency to lodge on low-lying fertile fields.

Starter

Starter is a short, early maturity variety with high test weight, high protein, good straw strength, and yellow kernel color. Starter has a good yield record but stress conditions can cause reduction.

Barley Variety Selection for Grain

Most barley grown in Nebraska is used for feed grain rather than used in malting. When selecting a barley variety, consider yield potential, test weight, straw strength, disease resistance, and maturity. Commonly grown barley varieties generally mature earlier than available oat or spring wheat varieties. Plump, heavy grain is desirable. Awns which break off the kernel during harvest tend to increase bushel weight. A smooth awn characteristic enhances suitability of the variety for forage. Strong straw strength is important to avoid lodging with good soil fertility.

Several leaf diseases are common on barley and selecting resistant varieties can minimize yield loss. All barley varieties are susceptible to one or more races of loose smut. Treat seed with a systemic fungicide, especially if the seed production field was known to have had loose smut infection. *Table II* shows characteristics of barley varieties included in recent Nebraska tests.

Table II. Characteristics of some barley varieties in recent Nebraska tests.

			Agronomic characteristics					Disease resistance ^b		
Variety	Origin	Year released	Head type	Awn type ^a	Maturity	Straw strength	Plant height	Stem rust	Loose smut	Leaf disease
Bowman	North Dakota	1984	2 row	S	Early	Good	Med-short	S	S	MR
Hazen	North Dakota	1984	6 row	S	Med-early	Good	Medium	S	S	R
Lud ^d	NAPB ^c	1975	2 row	R	Late	Fair	Short	S	S	--
Morex	Minnesota	1978	6 row	S	Medium	Fair	Medium	S	S	R
Robust ^d	Minnesota	1983	6 row	S	Medium	Good	Medium	S	S	R

^aR = Rough; S = Smooth.

^bS = Susceptible; MS = Moderately susceptible; MR = Moderately resistant; R = Resistant.

^cReleased by North American Plant Breeders.

^dU.S. Protect Variety. Seed may be legally sold by variety name only when produced and labeled as certified seed, according to the provisions of the U.S. Plant Variety Protection Act.

Variety Description

Barley varieties adapted for grain and forage production in Nebraska are shown in *Figure 1*. Consult the most recent *Nebraska Small Grain Variety Tests, EC 91-102* or later edition, for detailed grain yield and performance data.

Bowman

Bowman is a two-row barley with plump kernels and good test weight. Bowman is early maturing, of medium-short height, and has strong straw. Bowman has good disease resistance, but like other varieties, is susceptible to loose smut.

Hazen

A variety released by North Dakota, Hazen is medium-early in maturity, medium height, and has strong straw. Hazen is resistant to stem rust and spot blotch. Kernels have a smooth awn.

Robust

Robust is a six-row barley with a semi-smooth awn. Robust is medium in maturity, has medium height, strong straw, and high yield potential. Robust is susceptible to loose smut but has good leaf disease resistance.

Spring Wheat Variety Selection for Grain

Spring wheat generally matures 10 to 14 days later than winter wheat. The later maturity date for spring wheat increases the probability of encountering hot weather during the grain-fill period. For this reason, spring wheat production in Nebraska tends to be where early summer temperatures are more moderate than those further south.

When selecting a spring wheat variety consider yield potential, maturity, straw strength, and test weight. Milling and baking quality also are important in selecting a hard red spring wheat variety. *Table III* shows characteristics of spring wheat varieties tested in Nebraska.

Table III. Characteristics of some hard red spring wheat varieties in recent Nebraska tests.

			Agronomic characteristics				Disease resistance ^a	
Variety	Origin	Year released	Maturity	Straw strength	Height	Protein quality	Leaf rust	Stem rust
Butte 86	North Dakota	1986	Med-early	Fair	Med-tall	Med-high	MR	R
Guard ^b	South Dakota	1983	Early	Good	Med-short	Low-med	R	R
Len	North Dakota	1979	Med-late	Good	Med-short	High-med	MR-MS	R
Marshall ^b	Minnesota	1982	Late	Good	Med-short	Med-low	MR	R
Prospect	South Dakota	1988	Early	Good	Med-short	Med-low	R	R
Sharp	South Dakota	1991	Early	Good	Med-tall	Medium	R	R
Shield	South Dakota	1987	Early	Good	Med-tall	Medium	R	MR
Stoa	North Dakota	1984	Medium	Fair	Med-tall	High-med	R	R

^aMS = Moderately susceptible; MR = Moderately resistant; R = Resistant.

^bU.S. Protect Variety. Seed may be legally sold by variety name only when produced and labeled as certified seed, according to the provisions of the U.S. Plant Variety Protection Act.

Variety Description

Spring wheat varieties best adapted for grain production in Nebraska are shown in *Figure 1*. Detailed grain yield and performance data are given in the *Nebraska Spring Small Grain Variety Tests, EC 91-102* or latest edition.

Butte 86

This North Dakota release is a medium height variety with good to medium straw strength. Butte 86 is an early maturing variety. Test weight is very good and baking quality is satisfactory. Butte 86 is resistant to stem rust and moderately resistant to leaf rust.

Guard

Guard is a short, early maturing variety with strong straw strength. Guard has good resistance to disease and the Hessian fly. Test weight of Guard is very good and baking quality is medium. Guard has a very good yield record in Nebraska tests.

Prospect

Prospect is a short-statured variety with good straw strength and early maturity. Test weight of Prospect is similar to Guard. Quality evaluation is rated satisfactory for milling and baking. Prospect is resistant to leaf rust and moderately resistant to stem rust.

Shield

Shield was released by South Dakota. The variety has medium height, medium-strong straw strength, and early maturity. Shield has good test weight, similar to Butte 86, and has an excellent yield record in Nebraska tests. Shield is resistant to leaf rust and moderately resistant to stem rust.

Stoa

Stoa is a medium maturity spring wheat with medium-tall height and medium straw strength. Stoa has very good disease resistance, good test weight, and satisfactory baking qualities.

Small Grains Variety Selection for Forage

When harvesting spring small grains for silage, energy and nutrient return is nearly doubled compared with harvesting the crop as grain. Small grains may be harvested for silage in the boot, heading, flower, milk, or dough stages. The forage quantity increases and the quality decreases as the plant matures. Harvest at the dough stage is usually a good compromise. Small grains produce two to three tons dry matter per acre with yield varying by year and variety. Barley usually has the highest grain-to-forage ratio, followed by spring wheat and oats. More detail on using small grains for silage or hay is given in G84-696, *Small Grains for Silage or Hay*.

Any small grain variety adapted for grain production in an area will make satisfactory silage yields. However, medium to late maturing, taller varieties produce more tonnage, especially when harvested after boot stage. Ensiler, Russell, and Settler oats are good for silage production. Settler can be grown for either grain or forage, but Ensiler should be planted only as a forage oat. Settler and Ensiler are moderately resistant to the Barley Yellow Dwarf Virus. Hytest is a tall-statured variety suitable for either grain or forage production. Both Hytest and Russell are susceptible to Barley Yellow Dwarf Virus so tonnage will be lower if infection occurs.

Barley kernels have either smooth or rough awns in the head stage of development. If barley is made into silage, rough awned varieties are not too objectionable because ensiling softens the awns. If barley is to be used as hay, use smooth awn varieties. Rough awns cause considerable soreness and irritation to the mouth, lips, gums, and lower surface of the tongue in cattle. Barley varieties included in recent Nebraska tests are similar in height and maturity and all should produce equivalent forage yields of hay or silage. Hard red spring wheat varieties are often awned. Give the same consideration in selecting a spring wheat variety for hay or silage as discussed for barley.

File G487 under: FIELD CROPS

D-9, Small Grains

Revised January 1992; 6,000 printed.

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture. Elbert C. Dickey, Director of Cooperative Extension, University of Nebraska, Institute of Agriculture and Natural Resources.

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