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# WHEAT, OATS and BARLEY

*for Irrigated Areas*

by

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# Wheat, Oats and Barley for Irrigated Areas

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Cereal crops are important in the irrigated areas of Idaho. Spring wheat amounts to some 16 million bushels each year, almost half of the state's wheat crop. This is soft white wheat suitable for cracker or pastry flour. Irrigated winter wheat production has been increasing over the past several years and is approximately 655,000 bushels. Barley production is about 5 million bushels. This is feed-type barley used locally for livestock feed. Oats are grown to a more limited extent with production of about 3½ million bushels. Mixed grain which is a mixture of wheat and barley, or wheat, oats and barley totals about 10 million bushels annually.

Improved varieties of wheat, oats, and barley are continually being developed. They are tested at the University of Idaho branch experiment stations for their adaptability. This bulletin describes the varieties that are suggested for growing in the irrigated areas.

## Spring Wheat Varieties

### Lemhi 53 (Kenya x Lemhi 5)

This is a high yielding, beardless, common white wheat with good straw of medium height. It has good milling characteristics and produces a very high quality pastry flour. It is slightly earlier than Federation. Lemhi 53 is highly resistant to most races of stem rust common to this area. It is susceptible to leaf rust, stripe rust and smut. It was developed at the University of Idaho Branch Experiment Station at Aberdeen. Lemhi 53 is the most popular of our irrigated varieties and well adapted to all irrigated areas of the state and has largely replaced the older Lemhi.

### Lemhi 62 (Kenya x Lemhi 6)

This variety was developed at the Branch Experiment Station at Aberdeen. It is identical with Lemhi 53 as far as yield, strength

of straw, maturity, earliness, milling and baking qualities and stem rust resistance are concerned. Lemhi 62 has resistance to an additional race of stem rust which might attack wheat in this area. It is susceptible to leaf rust, stripe rust and common smut. Lemhi 62 is adapted to the same areas as Lemhi 53.

**Federation** (An introduction from Australia)

This is a beardless, brown chaffed, common white wheat, slightly later than Lemhi. It is well adapted to all irrigated areas in the state. It has slightly stiffer straw than Lemhi and for that reason may be a little better adapted where sprinkler irrigation is used. Federation yields about 3% less than Lemhi. It was once a very popular variety but has now been largely replaced by Lemhi 53. Federation is susceptible to leaf, stem and stripe rust and common smut.

**Idaed** (Sunset x Boadicia—two Australian varieties)

Idaed is an early maturing, beardless, common white wheat with short, stiff straw. It is adapted to growing in northern Idaho or certain dryland areas in southern Idaho. It is grown to a limited extent under irrigation in the Boise Valley. It is a good variety to use as a companion crop when planting a legume because of its short straw, sparse foliage and early maturity. It yields about 10% less than Lemhi under irrigation. Idaed has excellent milling and



Field of certified Lemhi 53 wheat in Canyon County.

baking qualities when grown under irrigation or higher rainfall conditions where the protein content does not get too high. It does not have good baking qualities for pastry when grown under dryland conditions favoring high protein. Idaed is moderately resistant to stripe rust. It is susceptible to leaf and stem rust and common smut. It was developed at the University of Idaho.

**Idaed 59** (Timopheevi derivative C.I. 16633 x Idaed<sup>5</sup>)

Idaed 59 is so similar to Idaed that the difference cannot be distinguished. Idaed 59 has high resistance to stem rust and mildew, moderate resistance to stripe rust. It is susceptible to leaf rust and common smut. Developed by the University of Idaho, Idaed 59 is adapted to the same areas as Idaed.

**Baart** (An introduction from Australia)

Baart is a bearded, common white wheat having exceptionally long kernels of a semi-hard-to-hard texture. Slightly earlier in maturity than Lemhi, Baart has a disadvantage in its taller, weaker straw. Baart is well adapted to dryland areas of eastern Idaho, but also produces good yields under irrigation. It may be particularly useful when irrigation water is limited. Baart yields about 10% less than Lemhi under irrigation. Baart has excellent milling and baking qualities. Baart is susceptible to leaf, stem, and stripe rust and common smut.

**Irrigated Spring Wheat Trials -- Aberdeen**

Variety	Average Date Headed	Approximate Height Inches	Average Lodging %	Average Yield Bu/Acre
Lemhi	6/21	43	8.0	81.1
Lemhi 53	6/21	43	8.0	84.2
Lemhi 62	6/21	43	8.0	83.4
Federation	6/25	45	8.0	77.5
Idaed	6/16	38	10.0	72.0
Idaed 59	6/16	37	10.0	74.0

Harvesting certified Lemhi 53 wheat yielding 100 bushels per acre in Twin Falls County.





## Winter Wheat

Winter wheat can be grown successfully under irrigation and in some cases has certain advantages over the usual practice of growing spring wheat. These advantages are:

1. A saving of irrigation water
2. A more efficient and timely use of labor and water because of earlier planting and harvesting.
3. An aid in the control of wild oats because of strong competition given by the more winter hardy wheat.

Either white winter or red winter wheat can be grown. White winter has coarser straw and is less likely to lodge than red winter.

High yields can be produced if the crop is planted early enough in the fall to get it well established. In order to get adequate fall growth, winter wheat should be planted by September 15 in the area from Twin Falls to Idaho Falls. From Twin Falls west to Weiser it should be planted September 15-October 10. Winter wheat can be planted in some areas following the harvest of such crops as early potatoes, peas, beans, canning corn or a grain crop.

Hard red winter wheats are more winter hardy than white winter wheats. When hard red winter wheat is grown under irrigation on soils moderate in nitrogen fertility the grain is likely to be low in protein and not suitable for bread purposes. To produce grain with a satisfactory protein content for bread flour, the soils must be high in nitrogen fertility, usually higher than required for maximum yields.

### Winter Wheat Varieties

#### Columbia (Rio-Rex x Nebred)

Columbia is a brown chaffed, bearded Turkey-type wheat, developed at the Sherman Branch Experiment Station, Moro, Oregon. It matures a few days earlier and has slightly shorter straw than Itana. This variety has good milling and baking qualities for bread purposes. It can be grown under irrigation but may lodge on highly fertile soils. It is resistant to most races of common smut and is moderately resistant to dwarf smut. It is susceptible to leaf, stem and stripe rust.

#### Itana (Blackhull-Rex x Cheyenne)

Itana is a brown to black chaffed, bearded Turkey-type wheat developed at the Sherman Branch Experiment Station, Moro, Oregon. This mid-season variety has excellent shatter resistance and good seedling vigor. It produces a stiff straw of medium height. It is one of the better hard, red, winter varieties under irrigation but is more likely to lodge than Lemhi 53. It has good milling and baking qualities for bread purposes. It is resistant to approximately half of the races of common smut and to one race of dwarf smut. It is susceptible to leaf, stem and stripe rust.

#### Tendoy (Rex-Rio x Cheyenne<sup>4</sup>)

Tendoy is a white chaffed, bearded Turkey-type wheat very similar to Cheyenne, with medium height straw. Tendoy differs

from Turkey in having stronger, shorter straw and denser more erect heads. It has good milling and baking qualities for bread purposes. It is not recommended for growing under irrigation because of its tendency to shatter. Tendoy is moderately resistant to dwarf smut and resistant to most races of common smut. It is resistant to stripe rust but susceptible to leaf and stem rust. Tendoy was developed at the Idaho Agricultural Experiment Station, Moscow.

#### Delmar (Brevor x Utah Kanred)

Delmar is a white chaffed, bearded wheat with a semi-compact head and a relatively long, hard, red kernel. It is medium in height, slightly shorter than Itana. Straw strength is excellent and lodging is seldom a problem even under irrigation. Delmar has good milling and baking qualities for bread purposes. It is one of the better-yielding hard, red winter wheats when grown under irrigation and should be particularly useful where sprinklers are used. In Idaho dryland tests it has not yielded as well as Itana, Columbia or Tendoy. It has more resistance to the common bunt races than Itana and has greater resistance to dwarf bunt than Itana, Columbia or Tendoy. It is resistant to stripe rust but susceptible to leaf and stem rust. Delmar was developed at Utah State University, Logan, Utah.



Gaines and Itana growing in irrigated winter wheat nursery at Aberdeen. Note the short straw of Gaines. Nursery fertilized at rate of 80 pounds of nitrogen and 100 pounds phosphorous per acre.

#### Gaines (Norin 10—Brevor x Burt)

Gaines is a bearded, white chaffed common wheat with soft, white kernels. Gaines has the shortest straw of any commercial variety of wheat. It is highly resistant to lodging even under irrigation and heavy fertilization. It is highly resistant to most races of

common and dwarf smuts, is moderately resistant to stripe and leaf rust, but is susceptible to stem rust.

Gaines produces high yields of grain with satisfactory quality for soft, white wheat products when grown under irrigation. It is not recommended for the dry lands of southern Idaho because the grain may be of questionable quality, there may be poor seedling emergence when soil moisture is limited, and the straw may be too short for combining in the drier seasons. Gaines was developed at Washington State University, Pullman, Washington.

### Average Yields of Winter Wheat Under Irrigation

Variety	Average Date Headed	Average Height Inches	Average Test Weight lbs./bu.	Average Yield Bu/Acre	
				Aberdeen	Twin Falls
Delmar	6/7	45	62.2	89.8	86.5
Cheyenne	6/5	45	62.0	79.1	84.4
Itana	6/5	46	62.5	80.0	82.3
Columbia	6/3	42	63.1	78.8	82.0
Tendoy	6/4	47	62.0	75.4	81.3
Wasatch	6/5	49	62.6	61.5	71.0

### Barley Varieties

#### Feed-Type Barleys

#### Trebi (A selection from Turkey)

A medium season, high yielding, rough awned, blue kerneled, six-row feed barley which has been popular with growers in the irrigated areas of the state for many years. It is adapted to all regions of the State. It is resistant to loose smut, but susceptible to covered smut. Trebi has a weak straw and lodges badly when grown under irrigation on highly fertile soils.



Certified Trebi barley in Canyon County.

#### Velvon 11 (Colorado 3063 x Trebi)

This is a mid-season, white kerneled, six-rowed feed barley which is popular with some growers because of its smooth beards. It is moderately resistant to both loose and covered smut. Although



Velvon is slightly taller than Trebi, it has stiffer straw and does not lodge so badly on highly fertile soils. It yields about 7% less than Trebi. It is adapted to all irrigated areas in the State.

#### Bonneville (Colorado 3063 x Winter Club)

A white kernalled, smooth awned, six-rowed, compact-headed barley. Bonneville has stiff straw which resists lodging even on highly fertile, irrigated soils. It is about a week later in maturity than Trebi or Velvon. It has heavy foliage and is moderately resistant to loose and covered smuts. Bonneville yields slightly more than Trebi in tests at Aberdeen. It has a considerable yield advantage in tests in the Boise valley. It is grown primarily in the irrigated areas of the Magic Valley and Boise valley. Because of its late maturity, it should not be grown under dryland conditions or in short season areas.

#### Gem (Atlas x Vaughn)

Gem is a six-rowed, semi-smooth awned, white seeded barley with short heads of medium density. It is earlier than Trebi and has stiffer straw. It has light foliage, is resistant to covered smut, but susceptible to loose smut. It is popular in the Magic valley and Boise valley irrigated areas. It is also adapted to nonirrigated areas in north Idaho and southeastern Idaho drylands.

#### Malting Barley

#### Betzes (An introduction from Poland)

This is a two-rowed, rough awned, white kernalled barley. It has a shorter, stiffer, stronger straw than Trebi and is slightly later maturing. It is adapted to irrigated conditions and high producing nonirrigated areas. Yields are equal to Trebi under irrigation with generally a higher test weight. It is grown primarily in Montana, Colorado and Canada for malting purposes.

### Irrigated Barley Trials--Aberdeen

#### Feed Barley

Variety	Average Date Headed	Plant Height Inches	Per Cent Lodging	Test Weight	Average Bu/Acre Yield
Trebi	6/14	33	48.0	50.5	115.6
Gem	6/8	31	20.2	50.0	114.0
Bonneville	6/17	35	3.0	47.0	116.0
Velvon	6/14	33	35.0	50.0	107.5

#### Malting Barley

Betzes	6/16	33	23.0	55.0	118.4
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#### Winter Barley

Winter barley can be grown in the irrigated areas although spring barley is generally grown. The advantages of growing winter barley over spring barley under irrigation are:

1. A saving in irrigation water.

2. A more efficient use of labor and water because of earlier planting and maturity.
3. An aid in the control of wild oats because of the strong competition from the winter barley.

Adapted varieties of winter barley will yield about the same as the better irrigated spring barleys and will normally ripen about 10 days earlier. The greatest disadvantage of winter barley is the risk of losing the crop by winter killing.

Winter barley is less winter hardy than white winter wheat and considerably less hardy than red winter wheat. It should survive winter conditions most years in the Boise valley. It will probably succeed 4 out of 5 years in the Magic Valley and 3 out of 5 years in the area from Aberdeen to Idaho Falls.

Winter barley is not recommended north of Idaho Falls.

### *Winter Barley Varieties*

**Alpine** (Colorado 3063 x Winter Club x Purdue)

Alpine is a blue-kerneled distinctly six-rowed club-headed, rough-bearded variety. It is later in maturity than Idaho Club. Alpine winter barley is the best adapted variety for southern Idaho where winter hardiness and yield are of primary importance. Alpine is a feed barley and should not be grown in areas where it is likely to become mixed with malting types.

**Idaho Club** (An Idaho selection from Winter Club)

Idaho Club is a distinctly six-rowed, very dense club-headed, long rough-bearded, white-kerneled malting and feed barley with mid-tall stiff straw resistant to lodging. Under proper growing conditions it produces grain of good malting quality. It is grown extensively in northern Idaho.

### *Yields of Winter Barley Under Irrigation*

#### ABERDEEN, IDAHO

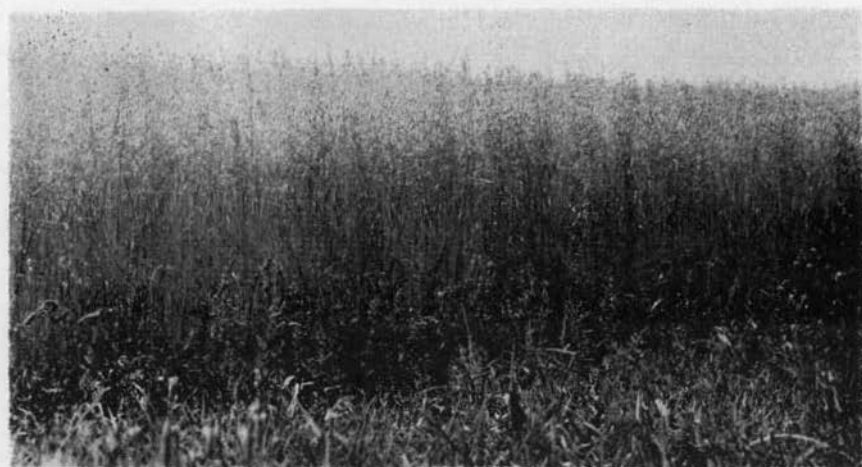
	Crop Year			Average Test Weight	Average Yield Bu/Acre
	1957-58	1958-59	1960-61		
Alpine	110.3	125.9	128.5	48.5	121.6
Idaho Club	94.2	109.1	122.3	48.5	108.5

This table shows that winter barley survived three consecutive winters at Aberdeen. Winter conditions during this period were not as severe as normal and winter barley cannot be expected to survive in this area each year.

### *Oat Varieties*

**Overland** (Victoria x Richland x Bannock)

This is a high yielding, short strawed, early maturing white oat that is very popular with growers throughout the State, under



Certified Park Oats growing in Canyon County.

both irrigated and dryland conditions. Overland is particularly popular as a companion crop when seeding legumes because of its short straw, smaller leaves and early maturity.

#### Park (Clinton x Overland x Overland)

Park is a midseason variety. It is a stiff strawed, white oat. It is a little taller with more straw than Overland, but resists lodging equally as well. It is somewhat higher yielding than Overland and it is well adapted throughout the state. Park is better than Overland for oat-hay purposes.

#### Irrigated Spring Oat Trials -- Aberdeen

Variety	Average Date Headed	Approximate Height Inches	Approximate Straw Strength	Average Yield Bu/Acre
Park	6/25	41	Strong	160.4
Overland	6/18	36	Strong	150.0

#### Mixed Grains

The growing of mixed grain has become very popular in the irrigated areas of southern Idaho. Mixtures should contain improved, high yielding varieties which will mature at about the same time. The following varieties are suggested:

	Comparative Date of Heading
Lemhi 53 or Federation wheat	6/23
Bonneville barley	6/17
Park oats	6/25
Idaed wheat	6/16
Gem barley	6/8
Overland oats	6/18

Growers generally favor mixtures having up to 49% wheat with the remainder of the mixture made up with barley or barley and oats. The maximum amount of wheat allowed in a mixture classified as mixed grain according to the Agricultural Stabilization and Conservation Committee provisions varies in different counties. Check with local ASC office regarding the mixed grain classification requirements in your county.

## Disease Resistance of Common Wheat Varieties

### Spring Wheat

	Stripe Rust	Stem Rust	Leaf Rust	Common Smut	Dwarf Smut
Baart	VS	VS	S	S	S
Federation	VS	VS	S	S	S
Lemhi	VS	VS	S	S	S
Lemhi 53	VS	R	S	S	S
Lemhi 62	VS	VR	S	S	S
Idaed	MR	S	S	S	S
Idaed 59	MR	VR	S	S	S

### Winter Wheat

Itana	VS	S	S	MR	VS
Columbia	VS	S	S	R	VS
Wasatch	MR	S	MR	R	MR
Cache	MR	S	S	R	MR
Tendoy	R	S	S	R	VS
Delmar	R	S	S	R	R
Turkey	MR	S	S	S	VS
Omar	VS	S	S	R	VS
Gaines	MR	S	R	R	?
Brevor	R	S	R	R	MR

S—Susceptible  
 VS—Very Susceptible  
 R—Resistant  
 MR—Moderately Resistant  
 VR—Very Resistant

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