



The Cereal Sentinel

A newsletter for Treasure Valley cereal producers

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Issue No. 10



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Important Dates:

Malheur Station Field Day
Parma Station Field Day

July 10
July 11

The goal of this newsletter is to serve the best interests of Treasure Valley cereal producers. It will be issued periodically as information warrants. Correspondence and inquiries should be addressed to: **Parma Research and Extension Center, 29603 U of I Lane, Parma, ID 83660 (208-722-6701) (Fax-208-722-6708) (Email PARMA@IDUI1.CSRV.UIDAHO.EDU)**



Brad Brown,
Extension Crop Management Specialist

Lodging

Lodging last year was more than a nuisance for some. It reduced yield and quality. Lodging made more difficult the harvest of clean grain. Increased discounts for dirtier grain meant lower prices and additional lost income. It slowed the harvest and increased wear and tear on combines.

The discounts are a fact of life we must learn to live with. They may even increase. Marketing cleaner grain should enable us to compete more successfully in foreign markets with Canada and Australia, countries who typically export grain with less than half the dockage we have in our exports. Lodging control is more meaningful in the face of these discounts and with market prices at all time highs.

Mild temperatures through November and into December enabled winter cereals to continue growth and tillering well beyond normal. As a result, winter cereals are about as well tillered as they get in our area. If all tillers survive to produce grain bearing heads (which is seldom), it can mean higher yield, especially for late planted wheat that is normally limited by too few tillers.

But these excellent stands also increase the potential for lodging. Competition between plants for light can reduce straw strength, increase plant height, and increase lodging.

Growing conditions which allow grain to fill to its maximum potential may also contribute to lodging. Heads that are well filled are more top heavy and prone to lodge.

Lodging, for many, is a significant barrier to higher yields. When all other factors for high yields are in place, yield is still limited

Wheat and Barley Lodging Resistance

Most of our irrigated winter wheat varieties have good straw strength. They generally don't lodge unless available N is excessive, plant population is high, or there is high wind, or worse, high wind and rain together.

Table 1 shows winter wheat lodging in one of our trials at Parma when seeding rates were evaluated together

with N fertilizer rates. Lodging increased with N regardless of seeding rate, but lodging was more severe and yields more depressed by lodging at the higher seeding.

Spring wheat and barley (both winter and spring) have less straw strength and are more prone to lodge than winter wheat. There are greater differences in lodging resistance among the barleys available than among the soft white spring wheat varieties commonly grown in the Treasure Valley.

Treasure, one of the most popular soft white spring wheats, may lodge slightly more than Penawawa, Vanna or Centennial. But the % *lodged* readings differ less than 5% among them when averaged over several years of testing.

Steptoe, the most commonly grown barley, is also one of the more susceptible to lodging. Any number of barley varieties are at least as productive, if not more, and have better straw strength. Gustoe, Maranna and Columbia have perhaps the best straw strength, followed by Payette and Colter. Even some two row barleys, such as Galena and Idagold, are less susceptible to lodging than the six row Steptoe. But few of these alternatives to Steptoe were available from local seed dealers this spring.

Table 1. Lodging percentage and yield as affected by seeding rates and N applied. Parma, 1985.

N Rate (lb/A)	Seeding Rate (lb/A)	
	60	120
	<i>lodging (%)</i>	
100	0	0
200	8	25
300	57	88
	LSD _{.10} = 9	
	<i>yield (bu/A)</i>	
100	133	133
200	127	114
300	103	86
	LSD _{.10} = 4	

What can you do now?

Water management

If you have excellent to excessive stands of wheat or barley in fields that may have received more than adequate nitrogen (generally from a failure to soil test), then water management becomes critical from here on.

You can't afford to limit production by not watering enough. Some growers believe you can stunt the plant during stem extension (between the jointing and boot stage) by withholding water and stressing the plant. But we've seen no evidence in the literature that this stunting occurs without some yield loss.

You certainly don't want to stress the plant from the boot stage through early grain fill. This is the most sensitive stage for cereals. A moisture deficit then will

cause greater yield loss than at any other stage after emergence.

Excessive irrigation contributes to lodging. In fields where lodging potential is greatest it will be a challenge to provide enough water to meet the requirements of the plant without contributing unduly to lodging.

For those with furrow irrigation, you might consider alternate furrow irrigation. If you have the option and flexibility, irrigating the alternate or every third furrow avoids the saturated conditions sometimes associated with greater lodging. You may also have the option of irrigating with shorter but more frequent sets. But these options will not be practical for many.

Know the water holding capacity of your soil and determine from the Bureau of Reclamation the daily consumptive use of your wheat or barley crop. Avoid applying more water than necessary when replenishing moisture used by the crop.

Avoid watering any later than necessary. When the chaff of the head begins to turn from green to a yellow color, additional water will have little if any effect on yield. But lodging may be increased with this late season water.

In 1987, late season watering at the soft dough stage increased lodging at the highest N rate and reduced test weight (Table 2). Yield was reduced with excessive N due to lodging prior to the dough stage. Values in the table are means of two varieties and four replications.

N Rate lb/A	Water Added in	Lodging % in	Test Weight lb/bu	Yield bu/A
0	0	0	58.9	98
	1.9	0	57.8	95
150	0	5	59.1	135
	1.9	8	58.6	135
300	0	56	55.9	116
	1.9	94	53.6	111
LSD _{.10}		9	0.7	5

Chemical treatment

The only chemical treatment labeled in the US for reducing lodging is *ethephon*, brand name **Cerone**, a label now owned by AgrEvo. Ethephon is converted to the growth regulator ethylene inside the plant, which serves to shorten the last (topmost) internode of the stem.

Ethephon can reduce plant height, increase straw strength, and thereby increase lodging resistance. It can not prevent all lodging that may occur due to extremely adverse weather conditions, but in many cases lodging can be significantly reduced if not avoided altogether. Where lodging is reduced, particularly early lodging, yield loss can be prevented.

We evaluated Ethephon on both winter wheat and winter barley at Parma. Winter wheat plant height was reduced somewhat in these trials using the .38 lb rate of Ethephon (Table 3). Lodging was significantly reduced with Ethephon when excessive N was present. Lodging with moderate N was low, therefore the effect of Ethephon was less dramatic at the moderate N rate. Note that the effect on lodging was much more striking than the effect on plant height.

Table 3. Winter wheat height, lodging and yield as affected by fertilization and ethephon. Parma, 1986-87

N Rate lb/A	Ethephon ai/A	Height in	Lodging Score ¹ 1-9	Yield bu/A
<i>1986</i>				
150	0	37.1	0.5	130
	0.38	33.6	0.2	134
300	0	36.0	8.0	122
	0.38	34.5	1.2	135
LSD _{.10}		0.7	0.9	
<i>1987</i>				
150	0	37.4	0.2 (0)	141
	0.38	36.3	0.2 (0)	138
300	0	38.0	2.5(33)	129
	0.38	36.6	0.4 (4)	138
LSD _{.10}		1.0	1.5	8

¹Lodging score integrates both area lodged and degree of lodging. .2=No lodging, 9=100% lodged. The percentage area lodged is shown in parentheses.

Even with Ethephon and some lodging protection, the higher N rate did not increase wheat yield above levels obtained with moderate N. The yield was simply preserved or maintained. The applied N rate of 300 lb N/A may seem unrealistic to some. But in the absence of soil testing, and following onions, sugarbeets, potatoes, mint and perhaps after other heavily fertilized crops, 300

lb/A of N as residual plus fertilizer N added is not unusual in the Treasure Valley.

Heading is delayed a few days with Ethephon. Maturity is also delayed, but it didn't affect yield.

Winter barley has considerably less straw strength than winter wheat and is more prone to lodge. From our results it seems that winter barley lodges well before yield potential is achieved (Table 4). Consequently, when lodging is reduced, winter barley unlike winter wheat may actually increase yield with higher N levels than traditionally used.

Winter barley in 1986 was taller than in 1987 due primarily to early spring drought and moisture stress in 1987. Height was reduced more in 1986 than in 1987 with Ethephon.

Despite differences in height, the same degree of lodging occurred in the winter barley both years. Lodging increased with higher N rates and Ethephon reduced lodging appreciably when excessive N was present. With lodging controlled, yield increased to levels well above and beyond that achieved with moderate N levels. This response was different from that of winter wheat.

What to treat

The window for applying Ethephon is relatively narrow. It should be applied within the time frame of when the flag leaf emerges and the awns begin to emerge (boot begins to swell). With calm weather, and limited acreage to spray, it is enough time. But this is a windy time of year and the spray can not always be applied when it needs to go on.

For this reason it might be appropriate to prioritize the fields that you think will need to be sprayed. The fields could be prioritized by their potential for lodging. Fields with the most dense stands, highest residual N, weakest strawed varieties, greatest exposure to wind, or other predisposing factors could be the first to be sprayed. That way if time is short, or weather precludes spraying all targeted fields within the label's window, then fields needing it the most would be covered. The results consistently show that the greatest return occurs in fields where lodging would otherwise be the most severe.

Ethephon applied **outside the label**, before the beginning of flag leaf emergence or after awns begin to appear, can result in significant yield reductions. The label also suggests that the compound not be applied if the plant is under stress. In all cases, **FOLLOW THE LABEL**.

Finally, despite our best efforts to avoid lodging, these efforts can be overridden by severe weather

Table 4. Winter barley height, lodging and yield as affected by fertilization and ethephon.

Parma, 1986-87				Fertilization	Height	Lodging	Yield
N	P ₂ O ₅	K ₂ O	PGR ¹			Score ²	
-----lb/A-----					in	%	bu/A
<i>1986</i>							
0					30.9	0.2	68
120					40.9	2.3	122
240					41.5	3.7	116
240	160	80			42.3	5.0	104
240	160	80	.38		36.0	0.4	142
LSD _{.10}					1.4	0.5	16
<i>1987</i>							
0					25.1	0.6 (10)	86
120					28.3	1.8 (31)	116
240					29.6	5.8 (71)	99
240	160	80			28.7	4.4 (64)	112
240	160	80	0.38		27.9	3.0 (49)	131
LSD _{.10}					1.5	1.9	12

¹PGR represents Ethephon applied at 0.38 lb ai/A

²Lodging score integrates both area lodged and degree of lodging. .2=No lodging, 9=100% lodged

conditions. Ethephon can certainly help, but it comes with no guarantees.

We're looking at excellent prices for the coming harvest. Some will be tempted to push our small grains to their limit with extra N. Some of the grain may actually benefit from additional N depending on the N available. But the additional N will involve additional risk of lodging.

Watch Out For

With prices at all time highs it behooves us to examine our small grains for important insect pests and diseases. Scouting and early detection are essential for avoiding economic losses.

Russian Wheat Aphid

Dr. Larry Sandvol, Extension Entomologist at the Aberdeen Research and Extension Center indicates that the mild winter was conducive for good Russian wheat

aphid survival. His crew has been surveying southern Idaho, including western Idaho, for the aphids.

Their early report was that significant numbers have survived the winter. This in itself is not unusual. But whereas they typically die off as the days warm, for reasons that are not altogether clear, this year they are surviving longer than normal.

The risk is that if their numbers aren't appreciably reduced, then higher early spring numbers can lead to more rapidly developing populations on our wheat. Aphid numbers weren't as high in the Treasure Valley as they were in some other areas of southern Idaho, but surviving aphids were found in some fields.

Winter wheat most apt to have been infested last fall was the wheat planted early, or other wheat that emerged next to fields where volunteering wheat may have been infested. The volunteers would in effect serve as a reservoir for aphids that could migrate to newly emerged wheat.

New aphid feeding would be indicated by the tell tale white striping of the leaves, most of which would be curled. The current threshold for treatment prior to jointing is 5% of infected plants, plants with reproducing colonies or fresh feeding damage. The threshold after jointing but before flowering is 10%. The threshold after flowering is 20%.

Several publications are available from either county Cooperative Extension offices or from Ag Publications (885-7982) at the University of Idaho:

Aphids Infesting Idaho Small Grain and Corn, Current Information Series No. 816

Fall Pest Problems of Winter Wheat, EXT 780

Sequential Decision Cards: A Tool for Russian Wheat Aphid Control, Current Information Series No. 884

Barley Stripe Rust

New races of Barley Stripe Rust fungi (*Puccinia striiformis f. sp. hordei*) are creating havoc in some areas of the West. California reported extensive damage to its barley in the Central Valley. Then OSU reported early and extensive infection in the Willamette Valley.

At one point these new races were identified as only one especially virulent race of the pathogen, Race 24. Now it is believed to be a series of virulent strains.

The new races damaged barley last year in the Magic Valley and points further east. Incidence in western Idaho

was low. The symptoms are similar to stripe rust in Wheat, i.e. elongated golden yellow striations on the leaf.

If Stripe Rust becomes a problem for us, control measures include:

- (1) controlling volunteer barley (and other *Hordeum* species such as foxtail barley) that carry inoculum (spores) into the next season,
- (2) delaying the planting of fall barley or planting spring barley earlier to avoid early fall or late spring infections,
- (3) Baytan seed treatments can provide some early seedling control (about 40 days after planting). Baytan is more expensive than more commonly used seed treatments, but other treatments are not as effective against this rust fungus.

Baytan likely will not provide full season protection. If the infection is severe, growers should consider a systemic fungicide. Tilt is a systemic registered for controlling barley rusts but must be applied prior to appearance of the ligule on the flag leaf.

It may already be too late for Tilt to be used on winter barley. Bayleton will probably not be effective if applied after flowering (which occurs prior to heading in some varieties). Be sure to follow seed treatment or fungicide labels carefully.

Eventually, variety resistance will be our first line of defense against these new races. But resistance will not be incorporated into a significant number of varieties for several years.

A new Oregon State winter barley release, Kold, has resistance, and more seed should be available next fall. Schuyler, another winter barley, is reported to have some resistance but the reaction is variable. All spring varieties commonly grown are susceptible so this should be of some concern to us.

If Barley Stripe Rust is severe, growers can in the future switch to other small grains if their rotation allows. Wheat, oats and triticale are not susceptible.

Dr. Robert Forster, the UI Extension Plant Pathologist at Kimberly, prepared a fact sheet on the disease. He will forward one to you if you will contact him (208-423-6603). We need to know if this disease exists in our area. Early detection enables you to minimize its impact. If you see Barley Stripe Rust, contact your Cooperative Extension agent and forward leaves with the symptoms in zip lock freezer bags for identification to Dr. Roland Line, USDA-ARS Plant Pathologist, 361 Johnson Hall, WSU, Pullman, WA 99164-6430. Dr. Forster would also appreciate being notified of any outbreaks.

Malting Barley Prospects

Did you see the Froedtert Malt Corp announcement of plans to build a \$65 million malting plant in Portland? This would have a significant impact on barley grown in Oregon and Washington. It no doubt would also affect are local barley market, since some of the barley now grown for feed in Oregon and Washington could instead be used for malt.

This is a welcome development for Treasure Valley small grain producers, barley producers in particular, but wheat producers may also benefit from another small grain option. Whether our producers raise malting barley that commands a better price, or they get a better price for more limited feed barley stocks, it's a win win situation.

The Treasure Valley has generally not had the option of contracting malting barley the last several years. Great Western contracted for a small acreage a few years ago but did not return the following year for reasons that are not entirely clear. One source told me that all the barley produced in our area met the malster's specifications.

Froedtert, with this location, would be well positioned to capture a rapidly growing Pacific Rim trade in Malt. Great Western currently enjoys some of this trade. Is this beginning to sound familiar to our wheat marketing?

As you know, well over 80% of the wheat produced in the Treasure Valley enters export markets. Whereas PNW feed barley was historically consumed domestically, that changed with the current marketing year. We exported record quantities of barley. In part because less corn was available, but also because of a large increase in interest in feed barley.

We will probably continue to produce feed barley in the PNW primarily for domestic consumption well into the future. But the proportion exported will likely increase.

There are other factors that may be influencing the location of this plant. There have been significant production problems in the midwest where much of the malt barley is produced. Our irrigated production tends to be relatively stable, with few of the disease problems that they've encountered in the midwest. Surely that has considerable appeal to maltsters interested in serving both domestic and international markets.

Also, don't rule out the possibility of increased interest by other malters in Treasure Valley barley production. One of these maltsters shared with us their belief that there will continue to be increasing competition

for limited irrigated acreage for contracting malting barley in traditional production areas of southern Idaho, namely eastern and south central Idaho.

One maltster is already examining the potential of the Treasure Valley to expand into. There may even be some very limited acreage already contracted in our area.

Because of the changing markets and increased interest in malting barley production, we will increase the evaluation of malting barley varieties in our Cooperative Extension variety testing program. The performance of these varieties will be reported in future *Cereal Sentinel* issues. Stay tuned.

Karnal Bunt

By now you have probably seen any number of news accounts of the Karnal Bunt discovery in Arizona. You may have also heard of some of the repercussions of the discovery. There is currently a quarantine on the movement of all wheat and equipment from areas known to be infested with Karnal Bunt. For all practical purposes, the buying and selling of durum wheat has come to a standstill.

This would have little consequence for Treasure Valley producers as there is very little durum production. But the effects of a quarantine of all wheat producing areas known to have the disease could seriously affect any production area's ability to export wheat.

National Survey

A national survey has been proposed to identify production areas (individual counties) that are free of Karnal Bunt. This survey will be used as the basis for the Karnal Bunt free designations. Oregon has begun their survey by sampling elevators storing last year's crop. They have yet to find Karnal Bunt spores. Idaho will survey the incoming 1996 crop.

Without the Karnal Bunt Free designation, we may find ourselves unable to market our wheat to traditional export markets. There may also be some reluctance of domestic users to accept wheat from areas that are not designated Karnal Bunt free.

What is the likelihood of finding Karnal Bunt spores in the production from the Treasure Valley or other Idaho counties? It is extremely unlikely. We have very little reason to expect that our wheat is contaminated. We fully expect the survey of our production to indicate the same.

Most of our wheat leaves the area after production. There is little movement of wheat back into Idaho since we have no processing or milling facilities. Our elevators do not store much wheat from other production areas. What little wheat that is stored from other areas is generally from areas such as ours that we also expect to be free of the disease. Even the isolated durum produced commercially in the area used seed from areas where no disease has been found.

The cooperation of elevators is essential for the success of this survey. Most will recognize the importance of proving our area to be Karnal Bunt free. The alternative is not pretty.

As it now is proposed, all company's with elevators in a county will be required to provide a representative sample of the wheat collected at their facility. Some companies may have multiple facilities in a given county, but, as I understand the proposed survey, not all their facilities need be sampled. Some elevators may be required to provide more than one sample depending on the amount of wheat they normally receive. If stations receive wheat from more than one county, individual samples for each county would be preferable.

Preventing Idaho Infection

Though this fungal disease poses little risk for our production, the potential for its influence on the marketing of our wheat can not be over emphasized.

The focus has been primarily on durum varieties of wheat, because it was first found on durum seed, and its mostly durum that is produced in the southwest. Let's not be complacent in this. The fact is, wheat commonly grown in Idaho is, according to one pathologist, ten times more susceptible to Karnal Bunt than durum wheat.

To keep the disease out of Idaho, growers need to be vigilant of any seed or equipment coming from the quarantined counties in the southwest. This includes all counties in Arizona; Imperial and Riverside counties in California; Don Ana, Hidalgo, Luna, and Sierra counties in New Mexico; and El Paso and Hudspeth counties in Texas. This seed should not be used unless it has been certified as free of Karnal Bunt.

The Idaho Dept. Of Agriculture is going to propose that wheat planted for the 1996 season, using seed that is subsequently found to be contaminated with Karnal Bunt spores, be destroyed prior to heading and the area planted either fumigated with methyl bromide or not replanted to a host crop (wheat, triticale, rye) for five years.

If you have seed from these areas and suspect seed may be contaminated you should contact the State Dept of Agriculture (332-8640) for seed testing.

Market Miscellaneous

High Prices and Stocks

With such high wheat prices you'd think there was a terrible shortage. But March 1 wheat stocks in Idaho were actually higher than they were last year. On farm stocks were about the same, 9 million bushels. Off farm stocks at 23.1 million bushels were actually **48% greater** than last year. Just shows how little Idaho's stocks seem to influence the markets. Nationally the story is quite different with March 1 stocks down 15% from last year.

All US wheat "free" carryover stocks on June 1, excluding the 110 million bushels in the CCC, are predicted to represent only 8% of last year's disappearance.

High Price Effects

Its amazing what good wheat and barley prices will due to the production or price of other commodities. Idaho dry bean acreage is down 18%, nationally its 12%. I've heard sweet corn seed contracts have had to be sweetened to get growers interested. You no doubt have your own examples.

Protein Specifications

The markets for soft white wheat with different specs for protein are becoming more and more commonplace. I remember some years ago when Korea first tendered for white wheat with a **maximum** of 9.5% protein. That in itself was interesting. But at the same time, Malaysia was tendering for white wheat with a **minimum** of 11%.

Since then several countries have bought white wheat at different protein levels. Japan wants less than 10.5%, Taiwan at times wants less than 9.0%, Korea previously wanted less than 9.5%.

But I saw the other day where Korea alone purchased soft white wheat out of Portland with three different protein specifications. They bought 13,000 MT (metric tons) with a **minimum** of 10.5%, 7,600 MT with a **maximum** of 10.5%, and 7,200 MT with a **maximum** of 9.5%. There was no word on a premium for any particular protein range. This is just a sampling of how protein specific our traditional markets are getting.

Increased Club Percentages in Western White Class

The Oregon Wheat Commission returned to the Pacific Rim to hawk more club wheat. They visited with Japan about increasing the minimum percentage in the Western White class from the current 20% to possibly higher. They also visited with Taiwan and other countries

about increasing their minimum club percentage in the white wheat they purchase.

Japan is apparently pleased with the increased percentage of club wheat that they have purchased since April last year (see Cereal Sentinel, April 1995). At that time, the percentage of club wheat required in the Western White class they purchased was increased from 10% to 20%. They report better quality of end products from the purchases made since April 1995.

Market prices for the club wheats have ranged from 5 to 10 cents a bushel higher than for common wheats grown in our area. Oregon and Washington's Club wheat producers should be happy with the development. *Australian Marketing Prowess*

According to a recent *Wheat Life* article, Australia is far ahead of us in supplying a variety of white wheat market classes and segregations for their customers. Whereas in 1939 Australia marketed only one class, they currently market 6 different classes and 45 separate

segregations. No wonder they have been so successful at taking more of our foreign market share.

Korean 377S Evaluation

Remember the December shipment of the Idaho 377S hard white spring wheat to Korea for noodle evaluation? The Idaho Wheat Commission has been to Korea to learn how the 377S variety performed.

The shipment was evaluated by several Korean millers and noodle makers. In general, the 377S was comparable in quality to the Australian Standard White they are currently using for many of their noodles.

This is good news. It means for at least some noodles that 377S is very competitive with what the Aussies are providing. Whether this results in a significant purchase of the current production for 1996 remains to be seen. Domestic millers also continue to express interest in this variety preserved production.

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