2010

Test Plot Results

Central Washington Grain Growers, Inc.

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Introduction

Welcome to the sixth annual Central Washington Grain Growers test plot report. This year was a mixed year for winter wheat production in the CWGG production area. The Wilbur area received above average rainfall, 13.8 inches during the crop season. As a result, winter wheat yields were very high with many growers recording record yields for their farm. Surprisingly, the spring wheat crop at Wilbur didn't respond to the high rainfall. The yields were lower than expected and the bushel test weights were low.

Waterville also received above average rainfall of 14.8 inches during the crop year. But, the winter wheat crop had a tough start last fall when rain fell during seeding time. Many fields required reseeding which pushed the seeding date later than optimal. In addition, the rain started the germination of weeds in the area. As a result, the winter wheat yields were only average to slightly above average. The spring wheat crop was also a disappointment at Waterville with lower than expected yields and low bushel test weights.

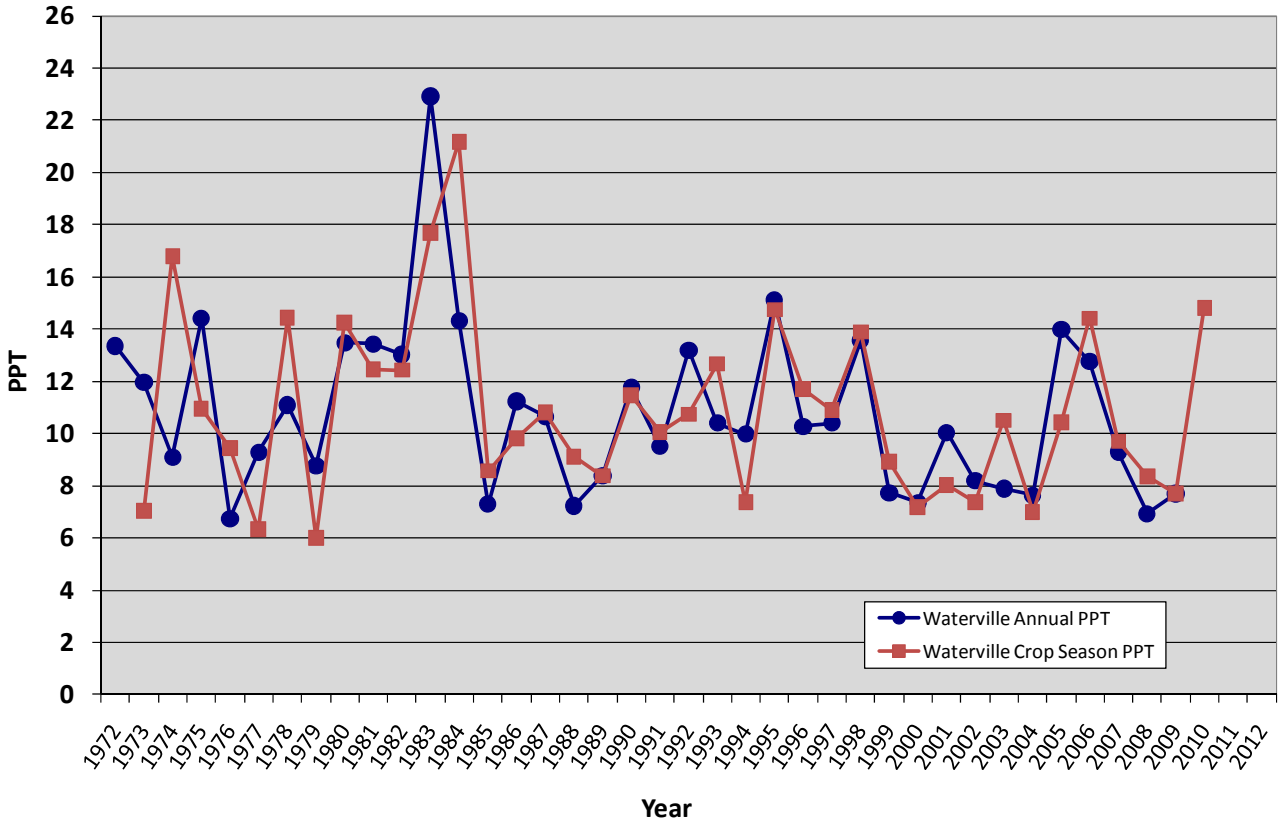
You will notice more trials in this report than in the past. We added trials for control of broadleaf weeds in winter peas, timing of broadleaf herbicide applications in winter peas, Clearfield™ winter wheat tolerance to Beyond® herbicide, response of winter peas to fungicide applications and crop choices for CRP take-out. While, many of these studies had interesting results, I found that I had over committed the time that I had to devote to my work. I have had to prioritize the areas that I feel need to be studied, dropping the low priority trials to allow the time necessary for market development of the triticale and winter pea programs.

We continue to advance the winter pea program and have started seed production of a new green winter pea variety, "180". Weed control in winter peas continues to be an issue and we started a large broadleaf weed control trial at Wilbur again this year. We added fall post-plant pre-emergent/incorporated and fall post-emergent herbicide treatments to the fall post-plant pre-emergent and spring post-emergent herbicide applications in our trial. We have several new two-gene Clearfield™ winter wheat lines to test from WSU of which two have Eltan in their background. We discontinued testing fungicides on winter peas, winter safflower variety trials, spring safflower variety trials and the CRP take-out trials.

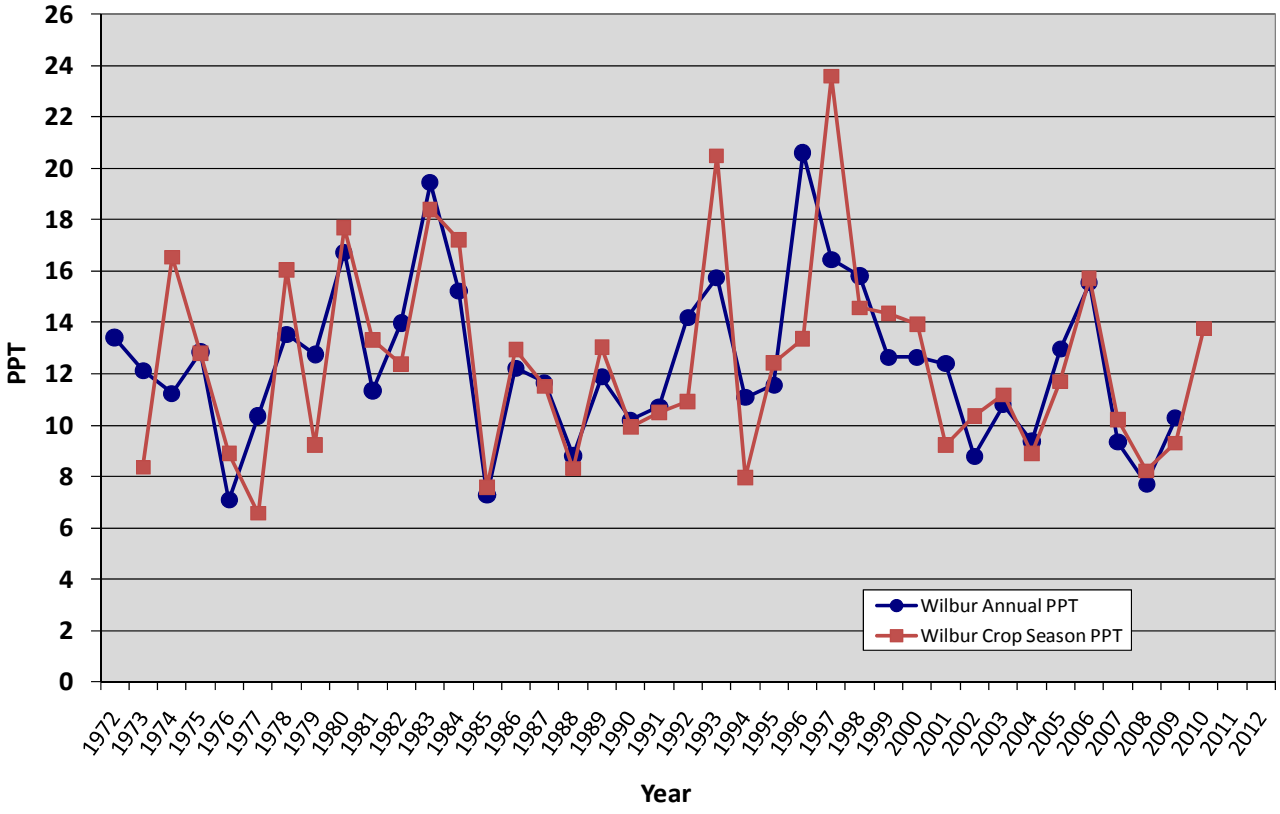
I would again like to thank the many people that have contributed to the data that was collected. The first and most important are the farmer/cooperators that allow me to plant test plots in their fields: Bob and Bobby Bandy, Mark Sheffels, Randy and David Brandt, Mark Thomsen, Lynn and Gary Polson, Bob Krause, Aaron Viebrock, Gale Badten, Tom Stahl and Dale Rinker. Also, thanks to Ag Link Co. who donated the dry fertilizer used on these trials and the many companies that contributed seed to plant the trials. I look forward to next years testing program, and hope that you will find this data useful to you on your farm.

Howard Nelson

Waterville Precipitation, 1972-2010



Wilbur Precipitation, 1972-2010



Winter Wheat Variety Yield Trials

Winter wheat variety testing continues to be a dominant feature of the CWGG variety program. In addition to public wheat varieties, we test varieties from the private wheat breeding companies which are now releasing many good varieties for our area. One of the CWGG priority areas is to test Clearfield™ wheat varieties. In the following reports, these varieties are denoted by an asterisk following their name.

This year, the Wilbur area received above average rainfall of 13.8 inches during the crop season. Of that total, 5.2 inches were received between April and June. The yields in the Wilbur trial were very good, the highest since 2007. Several varieties in the trial lodged of which Imi Bruehl, ORCF 103, and Farnum were the worst. This made our trial hard to harvested and keep the plots separated from adjacent varieties. While stripe rust was a major problem in many areas of the PNW this year, the Wilbur variety trial had very low levels of this disease.

The Waterville trial was seeded on August 20th and had emerged before a soaking rain was received the fall of 2009. The first replication experienced more crusting than the other reps which caused those yields to be lower. This caused the trial to have a high statistical CV value and very little significance between variety yields. Waterville received 14.8 inches of rain during the crop season of which 5.0 inches fell between April to May. Again, stripe rust was not a problem in the Waterville variety trial.

Two soft white winter wheat varieties continue to rise to the top of the list, George and Xerpha. We do not have three years of data for the Clearfield™ wheat varieties yet, but Imi Bruehl and ORCF 103 looked good based on this years data. We had our first 2-gene Clearfield™ wheat variety, 503 CL2 in our trial this year. This variety was bred for the Midwest and was included solely because it is a 2-gene type. We have set a priority to test more 2-gene Clearfield™ wheat varieties. We had only one club winter wheat variety in our trial last year and have included Cara in our trial for 2011. For HRW wheat varieties, our test results do not show a variety that performs consistently better than the other varieties in our area.

Waterville Winter Wheat Comparative Yield

Variety	*Class*	*3-Year Ave*		*2-Year Ave*		*2010*				*2009*		*2008*	
						Yield		*TW*	*Pro*	*Yield*		*Yield*	
Imi Bruehl*	Club	73.4	(1)	59.4	(6)	61.3	(5)	51.2	11.0	57.4	(18)	101.4	(1)
George	SWH	72.8	(2)	65.5	(1)	66.9	(1)	52.6	10.4	64.0	(9)	87.6	(5)
Bauermiester	HRW	72.1	(3)	64.1	(3)	62.0	(4)	54.3	11.8	66.2	(3)	88.2	(3)
Xerpha	SWH	72.0	(4)	64.3	(2)	66.6	(2)	53.0	10.0	62.0	(12)	87.4	(6)
Eltan	SWH	64.2	(5)	55.4	(11)	51.1	(13)	54.7	11.0	59.7	(16)	81.7	(7)
ORCF 102*	SWH	62.8	(6)	62.5	(4)	57.6	(8)	52.5	9.9	67.3	(2)	63.5	(14)
Paladin	HRW	61.0	(7)	55.7	(10)	55.2	(10)	55.5	12.1	56.1	(21)	71.7	(10)
Whetstone	HRW	59.9	(8)	55.4	(12)	46.2	(14)	54.4	12.5	64.6	(5)	68.9	(11)
BZ 1020*	SWH	59.1	(9)	57.9	(8)	53.0	(11)	53.8	11.6	62.7	(10)	61.6	(15)
Bruehl	Club	58.6	(10)	58.9	(7)	55.9	(9)	49.9	11.0	61.8	(14)	58.1	(17)
Legion	SWH	58.3	(11)	55.2	(13)	42.7	(17)	48.9	11.8	67.6	(1)	64.7	(12)
Chucker	Club	56.0	(12)	57.0	(9)	51.5	(12)	49.0	10.8	62.4	(11)	54.1	(20)
Farnum	HRW	54.8	(13)	50.0	(14)	45.2	(15)	46.3	13.2	54.7	(22)	64.5	(13)
Tubbs	SWH	52.5	(14)	49.5	(15)	41.5	(18)	50.3	11.6	57.4	(20)	58.6	(16)
Eddy	HRW	50.8	(15)	60.7	(5)	62.2	(3)	57.3	12.0	59.2	(17)	31.1	(24)
ORCF 103*	SWH					58.4	(6)	54.9	9.2				
Salute	SWH					58.0	(7)	50.9	11.7				
503 CL2*	HRW					45.0	(16)	57.0	12.8				

* Denotes Clearfield Wheat Variety

2010 WATERVILLE WINTER WHEAT VARIETY TRIAL

Previous Crop: 2009 Summer Fallow, 2008 Winter Wheat
Seeding Date: August 20, 2009
Seeding Rate: 60 lbs/acre
Fertility: Pre-Plant, 50-0-0-8, July 2009
            Top-Dress, 34-0-0-6, March 22, 2010
Herbicide: Buctril, 1 ½ pt/acre, May 4, 2010
Harvest: August 24, 2010

ANOVA
2010-10-05 04:58:23
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\WW.dt
.AOV Filename: 1WRB.AOV - 1 Way Randomized Blocks
  Y Column: 3) WA Yield
  1st Factor: 1) Variety
  Blocks: 2) Rep
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 54

Source	df	Type III SS	MS	F	P	
Blocks	2	3954.979259	1977.4896	34.671319	.0000	***
Main Effects						
Variety	17	3235.954259	190.35025	3.3374103	.0014	**
Error	34	1939.200741	57.035316<-			
Total	53	9130.134259				
Model	19	7190.933519	378.47019	6.6357165	.0000	***

R^2 = SSmodel/SStotal = 0.78760435655
Root MSerror = sqrt(MSerror) = 7.552172926
Mean Y = 54.4537037037
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 13.868979%

Compare Means
Factor: 1) Variety
Test: Tukey's HSD
Significance Level: 0.1
Variance: 57.0353159041
Degrees of Freedom: 34
Keep If:

n Means = 18
LSD 0.1 = 10.4267857561
MSD 0.1 = 21.3652204518

Rank	Mean Name	Mean	n	Non-significant ranges
1	George	66.9	3	a
2	Xerpha	66.6	3	a
3	Eddy	62.2	3	ab
4	Bauermeister	62.0	3	ab
5	Imi Bruehl	61.3	3	ab
6	ORCF 103	58.4	3	ab
7	Salute	58.0	3	ab
8	ORCF 102	57.6	3	ab
9	Bruehl	55.9	3	ab
10	Paladin	55.2	3	ab
11	BZ1020	53.0	3	ab
12	Chucker	51.5	3	ab
13	Eltan	51.1	3	ab
14	Whetstone	46.2	3	ab
15	Farnum	45.2	3	b
16	AP 503CL2	45.0	3	b
17	Legion	42.7	3	b
18	Tubbs	41.5	3	b

Compare Means
Factor: 2) Rep
Test: Tukey's HSD
Significance Level: 0.1
Variance: 57.0353159041
Degrees of Freedom: 34
Keep If:

n Means = 3
LSD 0.1 = 4.25671745998
MSD 0.1 = 5.34553288135

Rank	Mean Name	Mean	n	Non-significant ranges
1	3	64.7	18	a
2	2	55.0	18	b
3	1	43.7	18	c

Wilbur Winter Wheat Comparative Yield

Variety	*Class*	*3-Year Ave*		*2-Year Ave*		*2010*				*2009*		*2008*	
						Yield		*TW*	*Pro*	*Yield*		*Yield*	
Xerpha	SWH	60.5	(1)	71.4	(1)	95.2	(1)	61.5	12.5	47.5	(4)	38.8	(1)
Chucker	Club	56.5	(2)	69.5	(2)	92.2	(2)	53.2	13.2	46.8	(6)	30.5	(11)
George	SWH	55.7	(3)	65.8	(5)	90.5	(3)	58.0	12.7	41.1	(13)	35.5	(3)
Paladin	HRW	54.1	(4)	65.2	(6)	76.6	(14)	59.7	14.6	53.7	(1)	32.1	(10)
Legion	SWH	51.7	(5)	63.7	(7)	89.2	(6)	57.7	13.4	38.1	(15)	27.9	(14)
Bruehl	Club	50.3	(6)	66.0	(4)	89.6	(4)	54.8	13.4	42.4	(12)	19.0	(19)
Farnum	HRW	49.9	(7)	57.9	(12)	83.4	(11)	57.0	13.7	32.3	(22)	33.9	(6)
Eltan	SWH	48.5	(8)	61.5	(8)	85.1	(8)	58.9	12.1	37.9	(16)	22.5	(18)
Eddy	HRW	47.4	(9)	55.0	(14)	66.7	(17)	56.6	15.5	43.2	(11)	32.2	(9)
Whetstone	HRW	47.3	(10)	54.5	(15)	64.6	(18)	57.4	15.6	44.4	(9)	32.8	(8)
ORCF 102*	SWH	46.9	(11)	60.9	(10)	89.6	(5)	56.0	13.7	32.1	(23)	18.9	(20)
Tubbs	SWH	46.5	(12)	57.0	(13)	77.3	(13)	55.4	12.9	36.7	(18)	25.4	(16)
Imi Bruehl*	Club	46.0	(13)	60.0	(11)	83.4	(10)	52.8	12.6	36.6	(19)	18.0	(22)
Bauermiester	HRW	45.5	(14)	53.2	(16)	68.9	(16)	55.5	13.1	37.5	(17)	30.1	(12)
BZ 1020*	SWH	44.4	(15)	61.2	(9)	87.5	(7)	57.4	12.2	34.8	(20)	10.8	(25)
ORCF 103*	SWH			66.1	(3)	83.3	(12)	60.3	13.4	48.9	(2)		
Salute	SWH					83.7	(9)	54.9	12.8				
503 CL2*	HRW					74.9	(15)	59.3	14.9				

* Denotes Clearfield Wheat Variety

2010 WILBUR WINTER WHEAT VARIETY TRIAL

Previous Crop: 2009 Summer Fallow, 2008 Winter Wheat
Seeding Date: September 2, 2009
Seeding Rate: 60 lbs/acre
Fertility: Pre-Plant, 75-0-0-12, August 2009
Top-Dress, 52-0-0-10, March 8, 2010
Herbicide: Buctril, 1½ pt/acre, May 4, 2010
Harvest: August 12, 2010

ANOVA
2010-10-05 05:05:13
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\WW.dt
.AOV Filename: 1WRB.AOV - 1 Way Randomized Blocks
  Y Column: 4) WB Yield
  1st Factor: 1) Variety
  Blocks: 2) Rep
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 54

Source	df	Type III SS	MS	F	P	
Blocks	2	1219.395926	609.69796	8.4814328	.0010	**
Main Effects						
Variety	17	3950.265926	232.36858	3.2324506	.0018	**
Error	34	2444.130741	71.886198<-			
Total	53	7613.792593				
Model	19	5169.661852	272.08747	3.784975	.0004	***

R^2 = SSmodel/SStotal = 0.67898643008
Root MSerror = sqrt(MSerror) = 8.47857289036
Mean Y = 81.8703703704
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 10.356094%

Compare Means
Factor: 1) Variety
Test: Tukey's HSD
Significance Level: 0.1
Variance: 71.8861982571
Degrees of Freedom: 34
Keep If:

n Means = 18
LSD 0.1 = 11.7058049269
MSD 0.1 = 23.9860210689

Rank	Mean Name	Mean	n	Non-significant ranges
1	Xerpha	95.2	3	a
2	Chucker	92.2	3	ab
3	George	90.5	3	abc
4	ORCF 102	89.6	3	abc
5	Legion	89.2	3	abc
6	BZ1020	87.5	3	abcd
7	Eltan	85.1	3	abcd
8	Salute	83.7	3	abcd
9	Farnum	83.4	3	abcd
10	Imi Bruehl	83.4	3	abcd
11	ORCF 103	83.3	3	abcd
12	Bruehl	81.4	3	abcd
13	Tubbs	77.3	3	abcd
14	Paladin	76.6	3	abcd
15	AP 503CL2	74.9	3	abcd
16	Bauermeister	68.9	3	bcd
17	Eddy	66.7	3	cd
18	Whetstone	64.6	3	d

Compare Means
Factor: 2) Rep
Test: Tukey's HSD
Significance Level: 0.1
Variance: 71.8861982571
Degrees of Freedom: 34
Keep If:

n Means = 3
LSD 0.1 = 4.77887484989
MSD 0.1 = 6.00125164194

Rank	Mean Name	Mean	n	Non-significant ranges
1	3	87.6	18	a
2	2	82.0	18	ab
3	1	76.0	18	b

Winter Triticale Variety Yield Trials

Waterville Winter Triticale Comparative Yield

Variety		3-Year Ave		2-Year Ave		2010 Yield		2009 Yield		2008 Yield	
TriMark 099	Triticale	4,860	(1)	4,863	(1)	4,135	(1)	5,590	(1)	4,855	(2)
TriMark 336	Triticale	4,467	(2)	4,113	(3)	3,625	(5)	4,600	(3)	5,175	(1)
TriMark 095	Triticale	4,116	(3)	4,209	(2)	3,853	(6)	4,565	(4)	3,931	(3)
O5TF-125	Triticale					4,255	(2)				
O5TF-119	Triticale					4,160	(3)				
O5TG-163	Triticale					4,122	(4)				

Winter triticale is establishing a base as a cropping alternative in the CWGG production area. Triticale grows well under marginal conditions, is tolerant to several pests that affect winter wheat and management is identical to winter wheat. The variety that we are currently recommending is TriMark™ 099 which has performed well in our production area. We have discontinued the TriMark™ 095 variety due to it's lower yield potential. New winter triticale varieties continued to be screened for improved yield and one variety at Wilbur, "125" had higher yields than TriMark 099 this year.

For next years trials, we planted the top three triticale varieties from 2010 and our long term check variety, Trimark™ 336. We added four new varieties that scored well for stripe rust resistance and high yield this year at Progene's St. John test plot.

Wilbur Winter Triticale Comparative Yield

Variety		3-Year Ave		2-Year Ave		2010 Yield		2009 Yield		2008 Yield	
TriMark 099	Triticale	4,284	(1)	5,369	(1)	5,866	(2)	4,871	(1)	2,114	(3)
TriMark 336	Triticale	3,508	(2)	4,250	(2)	4,566	(6)	3,934	(3)	2,024	(4)
TriMark 095	Triticale	3,456	(3)	4,086	(3)	4,606	(5)	3,566	(7)	2,195	(2)
O5TF-125	Triticale					6,292	(1)				
O5TF-119	Triticale					5,661	(3)				
O5TG-163	Triticale					4,876	(4)				

2010 WATERVILLE WINTER TRITICALE VARIETY TRIAL

Previous Crop: 2009 Summer Fallow, 2008 Winter Wheat
Seeding Date: August 20, 2009
Seeding Rate: 70 lbs/acre
Fertility: Pre-Plant, 50-0-0-8, July 2009
            Top-Dress, 34-0-0-6, March 22, 2010
Herbicide: Buctril, 1 ½ pt/acre, May 4, 2010
Harvest: August 24, 2010

ANOVA
2010-10-06 04:35:51
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\CoStat10.dt
.AOV Filename: 1WRB.AOV - 1 Way Randomized Blocks
  Y Column: 3) WA Yield
  1st Factor: 1) Variety
  Blocks: 2) Rep
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 18

Source	df	Type III SS	MS	F	P	
Blocks	2	1526867.444	763433.72	5.4483299	.0251	*
Main Effects						
Variety	5	847259.1111	169451.82	1.2093118	.3719	ns
Error	10	1401225.222	140122.52<-			
Total	17	3775351.778				
Model	7	2374126.556	339160.94	2.4204598	.0993	ns

R^2 = SSmodel/SStotal = 0.6288490968
Root MSerror = sqrt(MSerror) = 374.329430078
Mean Y = 4025.11111111
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 9.2998533%

Compare Means
Factor: 1) Variety
Test: Tukey's HSD
Significance Level: 0.1
Variance: 140122.522222
Degrees of Freedom: 10
Keep If:

n Means = 6
LSD 0.1 = 553.958261012
MSD 0.1 = 921.53225695

Rank	Mean Name	Mean	n	Non-significant ranges
1	05TF-125	4255	3	a
2	05TF-119	4160	3	a
3	TriMark 099	4135	3	a
4	05TG-163	4122	3	a
5	TriMark 095	3853	3	a
6	TriMark 336	3625	3	a

Compare Means
Factor: 2) Rep
Test: Tukey's HSD
Significance Level: 0.1
Variance: 140122.522222
Degrees of Freedom: 10
Keep If:

n Means = 3
LSD 0.1 = 391.707642856
MSD 0.1 = 499.719274171

Rank	Mean Name	Mean	n	Non-significant ranges
1	2	4285	6	a
2	3	4172	6	a
3	1	3618	6	b

2010 WILBUR WINTER TRITICALE VARIETY TRIAL

Previous Crop: 2009 Summer Fallow, 2008 Winter Wheat
Seeding Date: September 2, 2009
Seeding Rate: 70 lbs/acre
Fertility: Pre-Plant, 75-0-0-12, August 2009
            Top-Dress, 52-0-0-10, March 27, 2010
Herbicide: Buctril, 1 ½ pt/acre, May 4, 2010
Harvest: August 12, 2010

ANOVA
2010-10-06 04:43:00
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\CoStat10.dt
.AOV Filename: 1WRB.AOV - 1 Way Randomized Blocks
  Y Column: 4) WB Yield
  1st Factor: 1) Variety
  Blocks: 2) Rep
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 18

Source	df	Type III SS	MS	F	P	
Blocks	2	1589097.444	794548.72	2.5172482	.1302	ns
Main Effects						
Variety	5	7907216.444	1581443.3	5.0102469	.0148	*
Error	10	3156417.889	315641.79<-			
Total	17	12652731.78				
Model	7	9496313.889	1356616.3	4.2979615	.0191	*

R^2 = SSmodel/SStotal = 0.75053467154
Root MSerror = sqrt(MSerror) = 561.820068072
Mean Y = 5311.11111111
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 10.578202%

Compare Means
Factor: 1) Variety
Test: Tukey's HSD
Significance Level: 0.1
Variance: 315641.788889
Degrees of Freedom: 10
Keep If:

n Means = 6
LSD 0.1 = 831.419714573
MSD 0.1 = 1383.10074958

Rank	Mean Name	Mean	n	Non-significant ranges
1	05TF-125	6292	3	a
2	TriMark 099	5866	3	ab
3	05TF-119	5661	3	ab
4	05TG-163	4876	3	b
5	TriMark 095	4606	3	b
6	TriMark 336	4566	3	b

Compare Means
Factor: 2) Rep
Test: Tukey's HSD
Significance Level: 0.1
Variance: 315641.788889
Degrees of Freedom: 10
Keep If:

n Means = 3
LSD 0.1 = 587.902518186
MSD 0.1 = 750.014009248

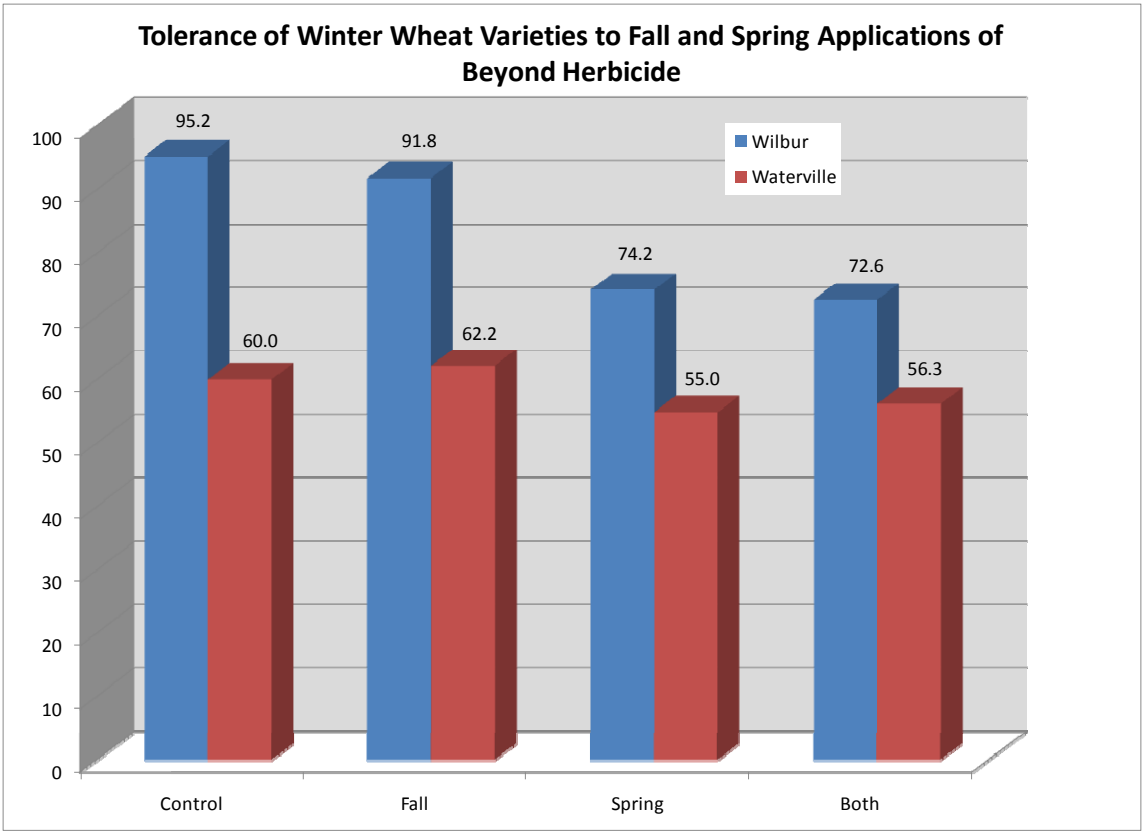
Rank	Mean Name	Mean	n	Non-significant ranges
1	3	5555	6	a
2	2	5486	6	a
3	1	4893	6	a

Clearfield Winter Wheat Variety Tolerance to Beyond® Herbicide

One of the more interesting trials that we conducted this year was a trial that tested four Clearfield™ winter wheat varieties for tolerance to Beyond® herbicide. Beyond® was applied in the fall, spring and both fall and spring to four Clearfield™ wheat varieties. The yields from those applications were compared to an untreated plot. The Wilbur site did not have many grassy weeds in the trial, but the Waterville site had significant amounts of both downy brome and jointed goatgrass.

The trial at Wilbur showed that a fall application of Beyond® did not significantly lower the yield compared to the untreated check. The spring application of Beyond® did significantly lower the yield and was by 21 bu/acre lower than the untreated check. The fall treatment of Beyond® at Waterville had a slightly higher, but not significant, yield than the untreated check. The yield increase in the fall treatment was most likely caused by the elimination of grassy weeds in that treatment and the competition from grassy weeds in the control treatment. The spring Beyond® treatments were only 5 bu/acre lower than the untreated check which was not a significant difference.

While current Clearfield™ wheat varieties lose yield potential from a Beyond® application, the elimination of grassy weed competition in fields with that problem, mitigates the crop response to Beyond on crop yields.



2010 WATERVILLE WINTER WHEAT BEYOND TIMING AND VARIETY TRIAL

Previous Crop: 2009 Summer Fallow, 2008 Winter Wheat
Seeding Date: August 20, 2009
Seeding Rate: 60 lbs/acre
Fertility: Pre-Plant, 50-0-0-8, July 2009
            Top-Dress, 34-0-0-6, March 22, 2010
Herbicide: Buctril, 1 ½ pt/acre, May 4, 2010
            Fall, Beyond, 5 oz/acre, October 6, 2009
            Spring, Beyond, 5 oz/acre, April 22, 2010
Harvest: August 24, 2010

ANOVA
2010-10-08 05:09:39
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\10ImiWht.dt
.AOV Filename: 2WCR.AOV - 2 Way Completely Randomized
  Y Column: 4) WA Yield
  1st Factor: 1) Variety
  2nd Factor: 2) Timing
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 48

Source	df	Type III SS	MS	F	P	
Main Effects						
Variety	3	2169.410833	723.13694	7.0873341	.0009	***
Timing	3	392.5291667	130.84306	1.2823691	.2971	ns
Interaction						
Variety * Timing	9	811.5258333	90.169537	0.8837353	.5497	ns
Error	32	3265.033333	102.03229<-			
Total	47	6638.499167				
Model	15	3373.465833	224.89772	2.2041818	.0297	*

R^2 = SSmodel/SStotal = 0.50816694386
Root MSerror = sqrt(MSerror) = 10.1011034876
Mean Y = 58.3791666667
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 17.302583%

Compare Means
Factor: 1) Variety
Test: Tukey's HSD
Significance Level: 0.1
Variance: 102.032291667
Degrees of Freedom: 32
Keep If:

n Means = 4
LSD 0.1 = 6.98518766787
MSD 0.1 = 9.84712062962

Rank	Mean Name	Mean	n	Non-significant ranges
1	ORCF 103	69.3	12	a
2	Imi Bruehl	58.5	12	b
3	503 CL2	53.2	12	b
4	1020	52.5	12	b

Compare Means
Factor: 2) Timing
Test: Tukey's HSD
Significance Level: 0.1
Variance: 102.032291667
Degrees of Freedom: 32
Keep If:

n Means = 4
LSD 0.1 = 6.98518766787
MSD 0.1 = 9.84712062962

Rank	Mean Name	Mean	n	Non-significant ranges
1	Fall	62.2	12	a
2	None	60.0	12	a
3	Both	56.3	12	a
4	Spring	55.0	12	a

2010 WILBUR WINTER WHEAT BEYOND TIMING AND VARIETY TRIAL

Previous Crop: 2009 Summer Fallow, 2008 Winter Wheat
Seeding Date: September 2, 2009
Seeding Rate: 60 lbs/acre
Fertility: Pre-Plant, 75-0-0-12, August 2009
            Top-Dress, 52-0-0-10, March 8, 2010
Herbicide: Buctril, 1½ pt/acre, May 4, 2010
            Fall, Beyond, 5 0z/acre, October 7, 2009
            Spring, Beyond, 5 oz/acre, April 16, 2010
Harvest: August 12, 2010

ANOVA
2010-10-08 05:14:48
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\10ImiWht.dt
.AOV Filename: 2WCR.AOV - 2 Way Completely Randomized
  Y Column: 5) WB Yield
  1st Factor: 1) Variety
  2nd Factor: 2) Timing
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 48

Source	df	Type III SS	MS	F	P	
Main Effects						
Variety	3	2400.888333	800.29611	12.635631	.0000	***
Timing	3	4273.365	1424.455	22.490285	.0000	***
Interaction						
Variety * Timing	9	1097.03	121.89222	1.9245191	.0839	ns
Error	32	2026.766667	63.336458<-			
Total	47	9798.05				
Model	15	7771.283333	518.08556	8.1798946	.0000	***

R^2 = SSmodel/SStotal = 0.79314591509
Root MSerror = sqrt(MSerror) = 7.95842059289
Mean Y = 79.675
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 9.9886044%

Compare Means
Factor: 1) Variety
Test: Tukey's HSD
Significance Level: 0.1
Variance: 63.3364583333
Degrees of Freedom: 32
Keep If:

n Means = 4
LSD 0.1 = 5.50346419572
MSD 0.1 = 7.75831350465

Rank	Mean Name	Mean	n	Non-significant ranges
1	1020	86.7	12	a
2	Imi Bruehl	84.2	12	a
3	ORCF 103	79.5	12	a
4	503 CL2	68.3	12	b

Compare Means
Factor: 2) Timing
Test: Tukey's HSD
Significance Level: 0.1
Variance: 63.3364583333
Degrees of Freedom: 32
Keep If:

n Means = 4
LSD 0.1 = 5.50346419572
MSD 0.1 = 7.75831350465

Rank	Mean Name	Mean	n	Non-significant ranges
1	None	90.8	12	a
2	Fall	87.2	12	a
3	Spring	71.8	12	b
4	Both	68.9	12	b

Winter Pea Yield Trials

Winter pea production also continues to be a priority in the CWGG testing program. Not only are we testing for varieties adapted to our area, but we are testing herbicides for broadleaf weed control and for ways to enhance winter survival of winter peas with the application of fungicides.

The winter pea trials got off to a good start last fall at both locations. The pea trial at Waterville had a hard rain following seeding, but peas have excellent emergence and pushed up through the crusting conditions at that location. In December, we had very cold conditions at all three locations: Waterville recorded –5F, Wilbur had 1F and Davenport had 2F. This was lower than the cold tolerance of some of the varieties and they didn't survive. Some varieties did survive of which Windham and "180" were two of the better varieties. This spring was colder than normal. Winter peas need to accumulate heat units before they break dormancy and they were very slow to start growth. In May, a hailstorm moved through the Wilbur area causing many pea blooms to be knocked from the plants. The rainfall received from that storm helped the peas to recover, but yield potential was decreased from the hail damage.

A new variety, PS805300**180**, continued to demonstrate good results this year and was again the top yielding variety at Waterville and the second best variety at Wilbur. At Wilbur, Windham continues to have the best yield. A drawback to the "180" variety was that it had a harvest index of 39% as compared to that of Windham of 59%. It is a green pea variety and has a seed size similar to Windham.

Another variety, PRO 072-6034, showed potential this year. While it's yield was slightly lower than Windham and "180", it had a harvest index of 88% and substantially larger seed size. In my opinion, this variety has food quality characteristics equal to the spring green pea varieties. This is the first year we have tested this variety and we will be following this varieties performance in 2011.

Wilbur Winter Pea Agronomic Notes

Variety	Class	Co	Vine Type[1]	Winter Survival	Start Bloom	Finish Bloom	Days in Bloom	Relative Maturity[2]	Maximum Height (in)	Mat Plant Height (in)	Harvest Index	Yield	Weight Per 100 Seeds (g)[4]
Whistler	Yellow	ProGene	AF-Short	4.3	24-May	10-Jul	47	4	26	10	38%	1724	15.7
PRO 084-7124	Yellow	ProGene	AF-Short	1.0	x	x	x	x	X	x		x	
PRO 084-7110	Yellow	ProGene	AF-Short	1.0	x	x	x	x	X	x		x	
PRO 072-6034	Green	ProGene	AF-Short	5.7	27-May	9-Jul	43	3	26	23	88%	2712	19.0
PRO 084-7126	Yellow	ProGene	AF-Short	2.0	x	x	x	x	24	12		x	
Specter	Yellow	WSU	AF-Tall	7.0	17-May	9-Jul	53	3	53	14	26%	2248	13.3
Windham	Yellow	WSU	AF-Short	7.3	24-May	7-Jul	44	2	29	17	59%	3396	13.7
PS03101146	Green	WSU	AF-Short	7.0	19-May	10-Jul	52	4	31	12	39%	2493	13.0
PS805300180	Green	WSU	AF-Short	7.0	24-May	10-Jul	47	4	33	13	39%	2987	13.0
PS05300234	Green	WSU	AF-Short	5.7	14-May	9-Jul	56	4	22	14	64%	1759	15.7

1 - AF = Afilia Type (Leafless) Vine

2 - 1 = Earlier Maturity, 5 = Later Maturity

3 - Plant Height Index = Mature Plant Height /Maximum Plant Height

4 - Average Spring Yellow Wt = 21.1g, Average Spring Green Wt = 19.4g, USDA/ARS 2005 Progress Report

Waterville Winter Pea Comparative Yield

Variety	Class	3-Year Ave		2-Year Ave		2010 Yield		2009 Yield		2008 Yield	
PS805300**180**	Green			1,461	(1)	2,921	(1)	1,754	(1)		
Specter	Yellow			1,385	(2)	2,769	(2)	1,681	(2)		
Windham	Yellow			1,131	(3)	2,261	(4)	1,055	(8)		
PS03101**146**	Green			1,113	(4)	2,225	(5)	1,093	(7)		
Whistler	Yellow			894	(5)	1,787	(6)	587	(16)		
PS05300**234**	Green			697	(6)	1,394	(7)	520	(18)		
Pro 074-7124	Yellow			61	(7)	121	(10)	530	(17)		
PRO 072-6034	Green					2,334	(3)				
PRO 084-7126	Yellow					479	(8)				
Pro 084-7110	Yellow					134	(9)				

Wilbur Winter Pea Comparative Yield

Variety	Class	3-Year Ave		2-Year Ave		2010 Yield		2009 Yield		2008 Yield	
Windham	Yellow	2,592	(1)	3,105	(1)	3,396	(1)	2,813	(1)	1,568	(2)
Specter	Yellow	2,074	(2)	2,342	(4)	2,248	(5)	2,436	(6)	1,538	(3)
PS03101**146**	Green	2,041	(3)	2,592	(3)	2,493	(4)	2,691	(3)	938	(8)
Whistler	Yellow	1,681	(4)	2,074	(6)	1,724	(7)	2,423	(7)	897	(9)
Pro 074-7124	Yellow	1,681	(5)	1,003	(7)	269	(9)	1,737	(18)	412	(16)
PS805300**180**	Green			2,750	(2)	2,987	(2)	2,512	(5)		
PS05300**234**	Green			2,182	(5)	1,759	(6)	2,605	(4)		
PRO 072-6034	Green					2,712	(3)				
PRO 064-7126	Yellow					1,118	(8)				
PRO 062-7110	Yellow					0	(10)				

2010 WATERVILLE WINTER PEA VARIETY TRIAL

Previous Crop: 2009 Summer Fallow, 2008 Winter Wheat
Seeding Date: August 24, 2009
Seeding Rate: Variable: To achieve 6 plants/ft2
Herbicide: Spartan 5 oz/acre, Aug 29, 2009
Assure II 12 oz/ac April 14, 2010
Harvest: July 27, 2010

ANOVA
2010-10-05 03:26:45
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\CoStat10.dt
.AOV Filename: 1WRB.AOV - 1 Way Randomized Blocks
Y Column: 3) WA Yield
1st Factor: 1) Variety
Blocks: 2) Rep
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 30

Source	df	Type III SS	MS	F	P	
Blocks	2	1680289.267	840144.63	7.0491808	.0055	**
Main Effects						
Variety	9	30389444.8	3376605	28.331192	.0000	***
Error	18	2145299.4	119183.3<-			
Total	29	34215033.47				
Model	11	32069734.07	2915430.4	24.461736	.0000	***

R^2 = SSmodel/SStotal = 0.93729950894
Root MSerror = sqrt(MSerror) = 345.22934406
Mean Y = 1642.53333333
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 21.018103%

Compare Means
Factor: 1) Variety
Test: Tukey's HSD
Significance Level: 0.1
Variance: 119183.3
Degrees of Freedom: 18
Keep If:

n Means = 10
LSD 0.1 = 488.795385434
MSD 0.1 = 907.695332018

Rank	Mean Name	Mean	n	Non-significant ranges
1	PS805300180	2921	3	a
2	Specter	2769	3	a
3	PRO 072-6034	2334	3	ab
4	Windham	2261	3	abc
5	PS03101146	2225	3	abc
6	Whistler	1787	3	bc
7	PS05300234	1394	3	c
8	PRO 084-7126	479	3	d
9	PRO 084-7110	134	3	d
10	PRO 084-7124	121	3	d

Compare Means
Factor: 2) Rep
Test: Tukey's HSD
Significance Level: 0.1
Variance: 119183.3
Degrees of Freedom: 18
Keep If:

n Means = 3
LSD 0.1 = 267.724258607
MSD 0.1 = 338.212080922

Rank	Mean Name	Mean	n	Non-significant ranges
1	3	1969	10	a
2	2	1544	10	b
3	1	1415	10	b

2010 WILBUR WINTER PEA VARIETY TRIAL

Previous Crop: 2009 Summer Fallow, 2008 Winter Wheat
Seeding Date: September 1, 2009
Seeding Rate: Variable to achieve 6 plants/ft2
Fertility: None
Herbicide: Spartan 5 oz/acre, September 2, 2009
            Assure II 12 oz/ac, March 24, 2010
Harvest: August 4, 2010

ANOVA
2010-10-05 03:37:16
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\CoStat10.dt
.AOV Filename: 1WRB.AOV - 1 Way Randomized Blocks
  Y Column: 4) WB Yield
  1st Factor: 1) Variety
  Blocks: 2) Rep
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 30

Source	df	Type III SS	MS	F	P	
Blocks	2	632455.8	316227.9	2.5493499	.1060	ns
Main Effects						
Variety	9	34421487.2	3824609.7	30.833042	.0000	***
Error	18	2232766.2	124042.57<-			
Total	29	37286709.2				
Model	11	35053943	3186722.1	25.690553	.0000	***

R^2 = SSmodel/SStotal = 0.94011897945
Root MSerror = sqrt(MSerror) = 352.196772652
Mean Y = 1870.6
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 18.828011%

Compare Means
Factor: 1) Variety
Test: Tukey's HSD
Significance Level: 0.1
Variance: 124042.566667
Degrees of Freedom: 18
Keep If:

n Means = 10
LSD 0.1 = 498.66026802
MSD 0.1 = 926.014465424

Rank	Mean Name	Mean	n	Non-significant ranges
1	Windham	3396	3	a
2	PS805300180	2987	3	ab
3	PRO 072-6034	2712	3	ab
4	PS03101146	2493	3	abc
5	Specter	2248	3	bc
6	PS05300234	1759	3	cd
7	Whistler	1724	3	cd
8	PRO 084-7126	1118	3	de
9	PRO 084-7124	269	3	ef
10	PRO 084-7110	0	3	f

Compare Means
Factor: 2) Rep
Test: Tukey's HSD
Significance Level: 0.1
Variance: 124042.566667
Degrees of Freedom: 18
Keep If:

n Means = 3
LSD 0.1 = 273.127477326
MSD 0.1 = 345.037886907

Rank	Mean Name	Mean	n	Non-significant ranges
1	2	1983	10	a
2	3	1963	10	a
3	1	1666	10	a

2010 WILKE WINTER PEA VARIETY TRIAL

Previous Crop: 2009 Chemical Fallow, 2008 Winter Wheat
Seeding Date: August 26, 2009
Seeding Rate: Variable to achieve 6 plants/ft2
Fertility: None
Herbicide: Spartan 5 oz/acre, Sept 4, 2009
            Assure II 12 oz/ac, April 14, 2010
Harvest: August 14, 2010

ANOVA
2010-10-05 03:48:39
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\CoStat10.dt
.AOV Filename: 1WRB.AOV - 1 Way Randomized Blocks
  Y Column: 5) DA Yield
  1st Factor: 1) Variety
  Blocks: 2) Rep
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 30

Source	df	Type III SS	MS	F	P	
Blocks	2	110760.2667	55380.133	1.1405349	.3417	ns
Main Effects						
Variety	9	6552130.133	728014.46	14.993209	.0000	***
Error	18	874013.0667	48556.281<-			
Total	29	7536903.467				
Model	11	6662890.4	605717.31	12.474541	.0000	***

R^2 = SSmodel/SStotal = 0.88403552327
Root MSerror = sqrt(MSerror) = 220.354898928
Mean Y = 681.466666667
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 32.335389%

Compare Means
Factor: 1) Variety
Test: Tukey's HSD
Significance Level: 0.1
Variance: 48556.2814815
Degrees of Freedom: 18
Keep If:

n Means = 10
LSD 0.1 = 311.991027434
MSD 0.1 = 579.368806811

Rank	Mean Name	Mean	n	Non-significant ranges
1	PS03101146	1242	3	a
2	Windham	1073	3	ab
3	PS805300180	1053	3	ab
4	PRO 072-6034	1048	3	ab
5	PS05300234	940	3	ab
6	Whistler	827	3	ab
7	Specter	598	3	bc
8	PRO 084-7124	33	3	cd
9	PRO 084-7126	0	3	d
10	PRO 084-7110	0	3	d

Compare Means
Factor: 2) Rep
Test: Tukey's HSD
Significance Level: 0.1
Variance: 48556.2814815
Degrees of Freedom: 18
Keep If:

n Means = 3
LSD 0.1 = 170.884523465
MSD 0.1 = 215.875881323

Rank	Mean Name	Mean	n	Non-significant ranges
1	2	752	10	a
2	1	689	10	a
3	3	603	10	a

Winter Pea "Health" Trial

CWGG has conducted various trials in the past to see if we could improve the condition of winter peas in the spring. Winter peas, in past years, have appeared to survive the winter, only for crop vigor in the spring to decline before stabilizing and then gradually improving. This condition has been mostly prevalent in Douglas county. Over the years we have tested different seed treatments and combinations of seed treatments to alleviate this condition. This year we decided to take a look at two fungicides, Phostrol® and Headline®, and apply them alone and in combination in the fall and spring.

Phostrol® is not a fungicide, but is phosphorous acid which has fungicidal properties. This form of P can not be used by the plant as a nutrient and when it is taken up by the plant, it has efficacy on the oomycetes class of plant pathogens. This class of pathogens is called the water molds and includes the damping off organism, pythium. Headline® is a wide spectrum fungicide and has a label for application to peas for increased yield through improved pea "health".

Two different rates of Phostrol® were applied with and without Headline® in the fall and spring to Windham winter peas at three locations. There were no statistical differences in the treatments and the untreated check.

2010 WATERVILLE WINTER PEA PHOSTROL TRIAL

Previous Crop: 2009 Summer Fallow, 2008 Winter Wheat
Seeding Date: August 24, 2009
Seeding Rate: Variable to achieve 6 plants/ft2
Herbicide: Spartan 5 oz/acre, Aug 29, 2009
            Assure II 12 oz/ac, April 14, 2010
Harvest: July 27, 2010

ANOVA
2010-10-05 04:20:39
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\Phostrol.dt
.AOV Filename: 1WCR.AOV - 1 Way Completely Randomized
  Y Column: 3) WA Yield
  1st Factor: 1) Treatment
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 48

Source	df	Type I SS	MS	F	P	
Main Effects						
Treatment	15	3136755.333	209117.02	1.9982078	.0492	*
Error	32	3348873.333	104652.29	<-		
Total	47	6485628.667				
Model	15	3136755.333	209117.02	1.9982078	.0492	*

R^2 = SSmodel/SStotal = 0.48364707487
Root MSerror = sqrt(MSerror) = 323.5000644
Mean Y = 2275.66666667
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 14.215617%

Compare Means
Factor: 1) Treatment
Test: Tukey's HSD
Significance Level: 0.1
Variance: 104652.291667
Degrees of Freedom: 32
Keep If:

n Means = 16
LSD 0.1 = 447.418178257
MSD 0.1 = 898.564177809

Rank	Mean Name	Mean	n	Non-significant r
1	Phostrol Fall 2.5 oz	2763	3	a
2	Phostrol Spring 4.0 oz	2608	3	ab
3	Phostrol Fall + Spring 4.0 oz	2558	3	ab
4	Untreated Check	2493	3	ab
5	Headline + Phostrol Fall + Spring 4.0	2440	3	ab
6	Headline Fall	2390	3	ab
7	Headline + Phostrol Fall 4.0 oz	2376	3	ab
8	Headline + Phostrol Fall + Spring 2.5	2323	3	ab
9	Headline Spring	2203	3	ab
10	Headline Fall + Spring	2122	3	ab
11	Phostrol Spring 2.5 oz	2113	3	ab
12	Headline + Phostrol Spring 4.0 oz	2109	3	ab
13	Phostrol Fall 4.0 oz	2087	3	ab
14	Phostrol Fall + Spring 2.5 oz	2056	3	ab
15	Headline + Phostrol Spring 2.5 oz	2036	3	ab
16	Headline + Phostrol Fall 2.5 oz	1734	3	b

2010 WILBUR WINTER PEA PHOSTROL TRIAL

Previous Crop: 2009 Summer Fallow, 2008 Winter Wheat
Seeding Date: September 1, 2009
Seeding Rate: Variable to achieve 6 plants/ft2
Fertility: None
Herbicide: Spartan 5 oz/acre, September 2, 2009
            Assure II 12 oz/ac, March 24, 2010
Harvest: August 4, 2010

ANOVA
2010-10-05 04:27:22
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\Phostrol.dt
.AOV Filename: 1WCR.AOV - 1 Way Completely Randomized
  Y Column: 4) WB Yield
  1st Factor: 1) Treatment
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 48

Source	df	Type I SS	MS	F	P	
Main Effects						
Treatment	15	1969413.979	131294.27	1.5819956	.1349	ns
Error	32	2655770	82992.813<-			
Total	47	4625183.979				
Model	15	1969413.979	131294.27	1.5819956	.1349	ns

R^2 = SSmodel/SStotal = 0.42580230063
Root MSerror = sqrt(MSerror) = 288.084731459
Mean Y = 3030.52083333
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 9.5061129%

Compare Means
Factor: 1) Treatment
Test: Tukey's HSD
Significance Level: 0.1
Variance: 82992.8125
Degrees of Freedom: 32
Keep If:

n Means = 16
LSD 0.1 = 398.436847215
MSD 0.1 = 800.193410606

Rank	Mean Name	Mean	n	Non-significant r
1	Phostrol Fall + Spring 4.0 oz	3324	3	a
2	Headline + Phostrol Fall 4.0 oz	3278	3	a
3	Headline + Phostrol Fall + Spring 4.0	3247	3	a
4	Phostrol Fall 2.5 oz	3237	3	a
5	Headline Spring	3167	3	a
6	Phostrol Fall + Spring 2.5 oz	3121	3	a
7	Headline Fall	3093	3	a
8	Headline + Phostrol Spring 2.5 oz	3060	3	a
9	Phostrol Fall 4.0 oz	3029	3	a
10	Headline Fall + Spring	3028	3	a
11	Phostrol Spring 4.0 oz	3011	3	a
12	Headline + Phostrol Fall + Spring 2.5	2974	3	a
13	Untreated Check	2810	3	a
14	Phostrol Spring 2.5 oz	2796	3	a
15	Headline + Phostrol Fall 2.5 oz	2677	3	a
16	Headline + Phostrol Spring 4.0 oz	2636	3	a

2010 WILKE WINTER PEA PHOSTROL TRIAL

Previous Crop: 2009 Chemical Fallow, 2008 Winter Wheat
Seeding Date: August 26, 2009
Seeding Rate: Variable to achieve 6 plants/ft2
Fertility: None
Herbicide: Spartan 5 oz/acre, Sept 4, 2009
            Assure II 12 oz/ac, April 14, 2010
Harvest: August 14, 2010

ANOVA
2010-10-05 04:31:34
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\Phostrol.dt
.AOV Filename: 1WCR.AOV - 1 Way Completely Randomized
  Y Column: 5) DA Yield
  1st Factor: 1) Treatment
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 48

Source	df	Type I SS	MS	F	P	
Main Effects						
Treatment	15	3503084.313	233538.95	0.9999353	.4786	ns
Error	32	7473730	233554.06	<-		
Total	47	10976814.31				
Model	15	3503084.313	233538.95	0.9999353	.4786	ns

R^2 = SSmodel/SStotal = 0.31913487946
Root MSerror = sqrt(MSerror) = 483.274313925
Mean Y = 1503.6875
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 32.139279%

Compare Means
Factor: 1) Treatment
Test: Tukey's HSD
Significance Level: 0.1
Variance: 233554.0625
Degrees of Freedom: 32
Keep If:

n Means = 16
LSD 0.1 = 668.394652521
MSD 0.1 = 1342.35826925

Rank	Mean Name	Mean	n	Non-significant r
1	Headline + Phostrol Spring 4.0 oz	2085	3	a
2	Headline + Phostrol Fall + Spring 2.5	1995	3	a
3	Headline + Phostrol Fall 2.5 oz	1802	3	a
4	Phostrol Fall + Spring 4.0 oz	1783	3	a
5	Phostrol Spring 4.0 oz	1579	3	a
6	Untreated Check	1576	3	a
7	Headline + Phostrol Spring 2.5 oz	1523	3	a
8	Headline + Phostrol Fall + Spring 4.0	1399	3	a
9	Headline Fall	1393	3	a
10	Phostrol Spring 2.5 oz	1355	3	a
11	Phostrol Fall 4.0 oz	1320	3	a
12	Phostrol Fall 2.5 oz	1305	3	a
13	Headline Spring	1291	3	a
14	Headline + Phostrol Fall 4.0 oz	1239	3	a
15	Phostrol Fall + Spring 2.5 oz	1217	3	a
16	Headline Fall + Spring	1197	3	a

Winter Pea Broadleaf Weed Control Trial

One of the major issues in winter pea production is control of broadleaf weeds. We have been working with Joe Yenish of WSU Extension to screen numerous herbicides for their ability to control weeds in peas. The picture to the left shows the differences we had this year between herbicide treatments at Waterville and their control of prickly lettuce.

Winter peas have different weed issues than spring peas. The growth pattern of winter annual broadleaf weeds match the growing season of winter peas. This makes winter annual weeds a problem in winter peas and they are not a problem in spring peas. Some of the problem weeds in our area are tansy mustard, tumble mustard and china lettuce. Tansy mustard was severe in several pea fields and caused high yield losses due to crop competition. The infestation of tansy mustard, in some treatments, in our herbicide trial at Wilbur was so severe that we were not able to harvest that trial because of the inability of our test plot combine to handle the weeds.

In past years, we tested only spring applications of post-emergent herbicides. This years trials included post-plant/pre-emergent herbicide treatments along with spring applications of post-emergent herbicide treatments. This increased the number of herbicides that we able to screen for control of these problem weeds. A complete list of the herbicide treatments are shown on page 32. Some of these herbicides have labels for use on peas, but many do not. The following data should not be used as a recommendation for control of weeds in commercial pea fields.

Several of the treatments had excellent control of both tansy mustard and china lettuce. One new herbicide, Reflex, stood out from the other herbicide treatments having good control of both weeds. Unfortunately, it is one of the herbicides that is not currently labeled for use on peas. It is moving through the registration process and hopefully it will be an option for weed control soon. We were able to harvest the herbicide trial at Waterville and there was not any

significant differences in yield between the herbicide treatments at that location.

In addition to the herbicide screening, we conducted a herbicide timing study at Creston. An application of Sencor, Chiptox and Chiptox/Sencor were applied every 2 weeks starting March 15th and ending on May 30th when the peas started to bloom. There was not any significant yield differences between the application dates.

This fall, Joe Yenish who had conducted the weed control ratings in our trials, left WSU to work for Dow AgriSciences. He was not able to provide the ratings for crop safety or weed control in our trials this year. The ratings that are given are my ratings for weed control from later in the growing season. Given the current financial situation at WSU, it is uncertain if Joe Yenish's position will be filled in the near future. We are investigating if there can be other arrangements made to provide the necessary weed control data for registration of herbicides in winter peas.

2010 Broadleaf Weed Control in Winter Peas

No.	Name	Timing	Price	Conc	Type	Rate	
1	None		$ -			None	
2	Pursuit	PRE	$19.53	2.00	EC	3.0	fl oz
	Prowl			3.80	EC	2.0	pt
3	Spartan	PRE	$15.84	4.00	F	3.0	oz
4	Spartan	PRE	$21.13	4.00	F	4.0	oz
5	Spartan	PRE	$24.96	4.00	F	3.0	oz
	Valor			0.51	DF	1.5	oz
6	Sharpen	PRE	$ 6.74	2.85	EC	1.5	fl oz
7	Sharpen	PRE	$ 8.98	2.85	EC	2	fl oz
8	Spartan	PRE	$27.87	4.00		3	oz
	Sharpen			2.85	EC	1.5	fl oz
9	Reflex	PRE	$11.25	2.00	EC	1.5	pt
10	Spartan	PRE	$28.63	4.00	F	3	oz
	Reflex			2.00	EC	1	pt
11	Lorox	PRE	$32.13	50.00	WP	1.25	lb
	Sencor			75.00	WP	4	oz
12	Karmex	PRE	$ 9.56	4.00	F	1.5	lb
13	Karmex	PRE	$12.75	4.00	F	2	lb
14	Karmex	PRE	$13.56	4.00	F	1.5	lb
	Sencor			75.00	WP	4	oz
15	Karmex	POST	$ 9.56	4.00	F	1.5	lb
16	Karmex	POST	$12.75	4.00	F	2	lb
17	Chiptox	POST	$ 6.00		EC	1	pt
	Sencor			75.00	WP	4	oz
18	Chiptox	POST	$ 7.33		EC	1	pt
	Sencor			75.00	WP	5.3	oz
19	Lorox	POST	$28.13	50.00	WP	1.25	lb
20	Raptor	POST	$ 9.69		EC	2	oz
	NIS					0.25%	
	UAN					2.50%	

This fall, we expanded our herbicide screening again, adding post-plant/pre-emergent/ incorporated and fall post-plant herbicide treatments to our trial. We used a spike tooth harrow/coil packer implement to incorporate the herbicide following application to the test plot. We hope that this work will give growers more options for broadleaf weed control in winter peas in the future.

PRICKLEY LETTUCE WEED CONTROL IN WINTER PEAS
Cooperator: Tom Stahl
Pea Variety: Windham
Pre Emergent Application: 8-21-2009
Post Emergent Application: 4-14-2010

ANOVA
2010-11-04 09:02:26
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\10WPBroad.dt
.AOV Filename: 1WRB.AOV - 1 Way Randomized Blocks
  Y Column: 5) Prickley Lettuce-July
  1st Factor: 1) Treatment
  Blocks: 2) Rep
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 80

Source	df	Type III SS	MS	F	P	
Blocks	3	2513.75	837.91667	2.892649	.0431	*
Main Effects						
Treatment	19	19693.75	1036.5132	3.5782421	.0001	***
Error	57	16511.25	289.67105<-			
Total	79	38718.75				
Model	22	22207.5	1009.4318	3.4847521	.0001	***

R^2 = SSmodel/SStotal = 0.57355932203
Root MSerror = sqrt(MSerror) = 17.0197253982
Mean Y = 66.875
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 25.450057%

Compare Means
Factor: 1) Treatment
Test: Tukey's HSD
Significance Level: 0.1
Variance: 289.671052632
Degrees of Freedom: 57
Keep If:

n Means = 20
LSD 0.1 = 20.1224718081
MSD 0.1 = 41.4685609328

Rank	Mean	Name	Mean	n	Non-significant rang
1	10	Spartan/Reflex, Pre	100.0	4	a
2	9	Reflex, Pre	97.5	4	a
3	16	Karmex 2.0 lb, Post	90.0	4	ab
4	14	Karmex/Sencor, Pre	80.0	4	abc
5	17	Chiptox/Sencor 4 oz, Post	75.0	4	abc
6	5	Spartan/Valor, Pre	75.0	4	abc
7	8	Spartan/Sharpen, Pre	75.0	4	abc
8	3	Spartan 3 oz, Pre	70.0	4	abc
9	19	Lorox, Post	67.5	4	abc
10	15	Karmex 1.5 lb, Post	67.5	4	abc
11	13	Karmex 2.0 lb, Pre	65.0	4	abc
12	4	Spartan 4 oz, Pre	60.0	4	abc
13	2	Pursuit/Prowl, Pre	60.0	4	abc
14	11	Lorox/Sencor, Pre	55.0	4	bc
15	20	Raptor 2 oz, Post	52.5	4	bc
16	18	Chiptox/Sencor 5.3 oz, Post	52.5	4	bc
17	1	Untreated Check	50.0	4	bc
18	12	Karmex 1.5 lb, Pre	50.0	4	bc
19	6	Sharpen 1.5 oz, Pre	47.5	4	c
20	7	Sharpen 2.0 oz, Pre	47.5	4	c

Compare Means
Factor: 2) Rep
Test: Tukey's HSD
Significance Level: 0.1
Variance: 289.671052632
Degrees of Freedom: 57
Keep If:

n Means = 4
LSD 0.1 = 8.99904296766
MSD 0.1 = 12.6197883938

Rank	Mean	Name	Mean	n	Non-significant ranges
1	4		76.5	20	a
2	2		64.5	20	ab
3	1		64.0	20	ab
4	3		62.5	20	b

TANSEY MUSTARD WEED CONTROL IN WINTER PEAS
Cooperator: Mark Sheffels
Pea Variety: Windham
Pre Emergent Application: 8-26-2009
Post Emergent Application: 3-31-2010

ANOVA
2010-11-04 08:40:32
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\10WPBroad.dt
.AOV Filename: 1WRB.AOV - 1 Way Randomized Blocks
  Y Column: 4) Tansey July
  1st Factor: 1) Treatment
  Blocks: 2) Rep
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 80

Source	df	Type III SS	MS	F	P	
Blocks	3	653.75	217.91667	0.4513331	.7173	ns
Main Effects						
Treatment	19	53013.75	2790.1974	5.7788527	.0000	***
Error	57	27521.25	482.82895<-			
Total	79	81188.75				
Model	22	53667.5	2439.4318	5.0523728	.0000	***

R^2 = SSmodel/SStotal = 0.66102138535
Root MSerror = sqrt(MSerror) = 21.9733690491
Mean Y = 55.375
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 39.681028%

Compare Means
Factor: 1) Treatment
Test: Tukey's HSD
Significance Level: 0.1
Variance: 482.828947368
Degrees of Freedom: 57
Keep If:

n Means = 20
LSD 0.1 = 25.9791793859
MSD 0.1 = 53.5381136882

Rank	Mean	Name	Mean	n	Non-significant rang
1	10	- Spartan/Reflex, Pre	95.0	4	a
2	14	- Karmex/Sencor, Pre	92.5	4	ab
3	13	- Karmex 2.0 lb, Pre	90.0	4	abc
4	9	- Reflex, Pre	87.5	4	abcd
5	5	- Spartan/Valor, Pre	87.5	4	abcd
6	2	- Pursuit/Prowl, Pre	77.5	4	abcde
7	11	- Lorox/Sencor, Pre	65.0	4	abcdef
8	4	- Spartan 4 oz, Pre	65.0	4	abcdef
9	17	- Chiptox/Sencor 4 oz, Post	55.0	4	abcdefg
10	8	- Spartan/Sharpen, Pre	52.5	4	abcdefg
11	12	- Karmex 1.5 lb, Pre	52.5	4	abcdefg
12	7	- Sharpen 2.0 oz, Pre	47.5	4	abcdefg
13	3	- Spartan 3 oz, Pre	47.5	4	abcdefg
14	20	- Raptor 2 oz, Post	40.0	4	bcdefg
15	6	- Sharpen 1.5 oz, Pre	37.5	4	cdefg
16	15	- Karmex 1.5 lb, Post	35.0	4	defg
17	18	- Chiptox/Sencor 5.3 oz, Post	30.0	4	efg
18	16	- Karmex 2.0 lb, Post	25.0	4	efg
19	19	- Lorox, Post	15.0	4	fg
20	1	- Untreated Check	10.0	4	g

Compare Means
Factor: 2) Rep
Test: Tukey's HSD
Significance Level: 0.1
Variance: 482.828947368
Degrees of Freedom: 57
Keep If:

n Means = 4
LSD 0.1 = 11.6182422213
MSD 0.1 = 16.2928167882

Rank	Mean	Name	Mean	n	Non-significant ranges
1	4		60.0	20	a
2	2		55.5	20	a
3	1		53.0	20	a
4	3		53.0	20	a

YIELD OF WINTER PEA BROADLEAF HERBICIDE APPLICATIONS
Cooperator: Tom Stahl
Pea Variety: Windham
Pre Emergent Application: 8-21-2009
Post Emergent Application: 4-14-2010

ANOVA
2010-11-04 09:24:01
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\10WPBroad.dt
.AOV Filename: 1WRB.AOV - 1 Way Randomized Blocks
  Y Column: 6) WA Yield
  1st Factor: 1) Treatment
  Blocks: 2) Rep
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 80

Source	df	Type III SS	MS	F	P	
Blocks	3	534259.2375	178086.41	0.8202914	.4880	ns
Main Effects						
Treatment	19	3070513.738	161605.99	0.7443802	.7579	ns
Error	57	12374780.01	217101.4<-			
Total	79	15979552.99				
Model	22	3604772.975	163853.32	0.7547317	.7635	ns

R^2 = SSmodel/SStotal = 0.22558659669
Root MSerror = sqrt(MSerror) = 465.941416627
Mean Y = 2589.3875
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 17.994271%

Compare Means
Factor: 1) Treatment
Test: Tukey's HSD
Significance Level: 0.1
Variance: 217101.403728
Degrees of Freedom: 57
Keep If:

n Means = 20
LSD 0.1 = 550.883918567
MSD 0.1 = 1135.26626161

Rank	Mean	Name	Mean	n	Non-significant rang
1	8	- Spartan/Sharpen, Pre	2939	4	a
2	11	- Lorox/Sencor, Pre	2832	4	a
3	17	- Chiptox/Sencor 4 oz, Post	2832	4	a
4	2	- Pursuit/Prowl, Pre	2828	4	a
5	1	- Untreated Check	2768	4	a
6	4	- Spartan 4 oz, Pre	2751	4	a
7	16	- Karmex 2.0 lb, Post	2712	4	a
8	3	- Spartan 3 oz, Pre	2646	4	a
9	5	- Spartan/Valor, Pre	2613	4	a
10	10	- Spartan/Reflex, Pre	2582	4	a
11	9	- Reflex, Pre	2564	4	a
12	14	- Karmex/Sencor, Pre	2539	4	a
13	15	- Karmex 1.5 lb, Post	2527	4	a
14	7	- Sharpen 2.0 oz, Pre	2487	4	a
15	20	- Raptor 2 oz, Post	2475	4	a
16	12	- Karmex 1.5 lb, Pre	2430	4	a
17	13	- Karmex 2.0 lb, Pre	2427	4	a
18	6	- Sharpen 1.5 oz, Pre	2387	4	a
19	19	- Lorox, Post	2261	4	a
20	18	- Chiptox/Sencor 5.3 oz, Post	2187	4	a

Compare Means
Factor: 2) Rep
Test: Tukey's HSD
Significance Level: 0.1
Variance: 217101.403728
Degrees of Freedom: 57
Keep If:

n Means = 4
LSD 0.1 = 246.362777925
MSD 0.1 = 345.486307456

Rank	Mean	Name	Mean	n	Non-significant ranges
1	4		2730	20	a
2	1		2554	20	a
3	3		2547	20	a
4	2		2526	20	a

EFFECT OF HERBICIDE TIMING ON THE YIELD OF WINTER PEAS
Cooperator: Bob Krause
Pea Variety: Windham

ANOVA
2010-11-04 09:40:15
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\CoStat10.dt
.AOV Filename: 1WRB.AOV - 1 Way Randomized Blocks
  Y Column: 3) WB Yield
  1st Factor: 1) Treatment
  Blocks: 2) Rep
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 80

Source	df	Type III SS	MS	F	P	
Blocks	3	1740058.338	580019.45	7.354157	.0003	***
Main Effects						
Treatment	19	1334238.737	70223.091	0.8903695	.5956	ns
Error	57	4495567.413	78869.604<-			
Total	79	7569864.488				
Model	22	3074297.075	139740.78	1.7717951	.0433	*

R^2 = SSmodel/SStotal = 0.40612313207
Root MSerror = sqrt(MSerror) = 280.837326095
Mean Y = 2328.3625
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 12.061581%

Compare Means
Factor: 1) Treatment
Test: Tukey's HSD
Significance Level: 0.1
Variance: 78869.6037281
Degrees of Freedom: 57
Keep If:

n Means = 20
LSD 0.1 = 332.034803429
MSD 0.1 = 684.26014503

Rank	Mean Name	Mean	n	Non-significant ranges
1	Apr 30 - Sencor	2520	4	a
2	Mar 31 - Sencor	2512	4	a
3	Apr 15 - Chiptox + Sencor	2482	4	a
4	May 15 - Chiptox + Sencor	2475	4	a
5	Mar 15 - Sencor	2428	4	a
6	Mar 31 - Chiptox + Sencor	2428	4	a
7	May 31 - Chiptox + Sencor	2413	4	a
8	May 31 - Sencor	2400	4	a
9	Mar 15 - Chiptox + Sencor	2365	4	a
10	Control 2	2352	4	a
11	May 31 - Chiptox	2340	4	a
12	Mar 15 - Chiptox	2304	4	a
13	May 15 - Sencor	2282	4	a
14	Mar 31 - Chiptox	2229	4	a
15	Apr 15 - Sencor	2223	4	a
16	Apr 15 - Chiptox	2219	4	a
17	Apr 30 - Chiptox	2214	4	a
18	Control 1	2197	4	a
19	May 15 - Chiptox	2150	4	a
20	Apr 30 - Chiptox + Sencor	2035	4	a

Compare Means
Factor: 2) Rep
Test: Tukey's HSD
Significance Level: 0.1
Variance: 78869.6037281
Degrees of Freedom: 57
Keep If:

n Means = 4
LSD 0.1 = 148.490478272
MSD 0.1 = 208.235300246

Rank	Mean Name	Mean	n	Non-significant ranges
1	3	2489	20	a
2	4	2460	20	a
3	1	2204	20	b
4	2	2160	20	b

Fall vs. Spring Planted Winter Pea Yield Trials

This is the second year we have conducted a trial to compare fall and spring planted winter pea varieties to spring planted pea varieties. The seed characteristics of winter peas are different from spring peas. Current varieties of winter peas have a mottled seed coat and are smaller than spring pea varieties. These seed differences would be very apparent if spring peas varieties were seeded into a winter pea field. This trial will show if it is practicable to re-seed winter peas in the spring and if we should seed the same variety of winter pea or use a spring pea variety.

Last years data showed that seeding winter peas in the spring did not result in acceptable yields of either spring or winter pea varieties. This years results were not as clear. The spring planted pea trial at Wilbur received hail damage from a storm that passed through while they were blooming. Many blooms were knocked off the pea vines causing a loss in yield loss. At the Wilke trial, the spring peas yielded higher than the winter peas. The poor condition of the winter pea trial compared to the good condition of the spring planted pea trial caused this result. We will repeat this trial again in 2011.

Wilbur Winter vs. Spring Pea Comparative Yield

Variety	3-Year Average	2-Year Average		2010 Yield	2010 Rank	2009 Yield		2008 Yield
Windham-Fall		3,105	(1)	3,396	(1)	2,813	(1)	
Universal		1,093	(2)	1,442	(4)	743	(3)	
Windham-Spring		844	(3)	939	(6)	749	(2)	
Cruiser		806	(4)	1,162	(5)	450	(4)	
180-Fall				2,987	(2)			
1146-Fall				2,493	(3)			
180-Spring				874	(7)			
1146-Spring				648	(8)			

Wilke Winter vs. Spring Pea Comparative Yield

Variety	3-Year Average	2-Year Average		2010 Yield		2009 Yield		2008 Yield
Windham-Fall		2,159	(1)	1,073	(6)	3,245	(1)	
Universal		1,394	(2)	1,795	(1)	993	(2)	
Windham-Spring		1,357	(3)	1,750	(2)	963	(3)	
Cruiser		1,079	(4)	1,612	(3)	545	(4)	
1146-Fall				1,242	(4)			
180-Spring				1,114	(5)			
1146-Spring				1,068	(7)			
180-Fall				1,053	(8)			

2010 WILBUR SPRING PEA vs. WINTER PEA VARIETY TRIAL

Previous Crop: Fall, 2009 Summer Fallow, 2008 Winter Wheat
                Spring, 2009 Winter Wheat, 2008 Chemical Fallow
Seeding Date: Fall, September 1, 2009
               Spring, March 30, 2010
Seeding Rate: Fall, Variable to Achieve 6 plants/ft2
               Spring, Variable to Achieve 8 plants/ft2
Fertility: Fall, None
            Spring, Starter, 10-20-0-12, March 30, 2010
Herbicide: Fall, Spartan 5 oz/acre, September 2, 2009
            Assure II 12 oz/ac, April 24, 2010
            Spring, None
Harvest: Fall, August 4, 2010
          Spring, August 14, 2010

ANOVA
2010-10-12 04:50:01
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\10SpringPea.dt
.AOV Filename: 1WRB.AOV - 1 Way Randomized Blocks
  Y Column: 3) WB Yield
  1st Factor: 1) Variety
  Blocks: 2) Rep
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 24

Source	df	Type III SS	MS	F	P	
Blocks	2	127612.3333	63806.167	1.3623947	.2880	ns
Main Effects						
Variety	7	23609761.96	3372823.1	72.016807	.0000	***
Error	14	655673.6667	46833.833<-			
Total	23	24393047.96				
Model	9	23737374.29	2637486	56.315827	.0000	***

R^2 = SSmodel/SStotal = 0.97312046991
Root MSerror = sqrt(MSerror) = 216.411259719
Mean Y = 1742.54166667
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 12.419288%

Compare Means
Factor: 1) Variety
Test: Tukey's HSD
Significance Level: 0.1
Variance: 46833.8333333
Degrees of Freedom: 14
Keep If:

n Means = 8
LSD 0.1 = 311.221834149
MSD 0.1 = 552.757118218

Rank	Mean Name	Mean	n	Non-significant ranges
1	Windham-Fall	3396	3	a
2	180-Fall	2987	3	ab
3	1146-Fall	2493	3	b
4	Universal	1442	3	c
5	Cruiser	1162	3	cd
6	Windham-Spring	939	3	cd
7	180-Spring	874	3	d
8	1146-Spring	648	3	d

Compare Means
Factor: 2) Rep
Test: Tukey's HSD
Significance Level: 0.1
Variance: 46833.8333333
Degrees of Freedom: 14
Keep If:

n Means = 3
LSD 0.1 = 190.58367262
MSD 0.1 = 241.627847582

Rank	Mean Name	Mean	n	Non-significant ranges
1	2	1824	8	a
2	1	1756	8	a
3	3	1647	8	a

2010 WILKE SPRING PEA vs. WINTER PEA VARIETY TRIAL

Previous Crop: Fall, 2009 Summer Fallow, 2008 Winter Wheat
Spring, 2009 Winter Wheat, 2008 Chemical Fallow
Seeding Date: Fall, August 26, 2009
Spring, April 15, 2010
Seeding Rate: Fall, Variable to Achieve 6 plants/ft2
Spring, Variable to Achieve 8 plants/ft2
Fertility: Fall, None
Spring, Starter, 10-20-0-12, April 14, 2010
Herbicide: Fall, Spartan 5 oz/acre, August 29, 2009
Assure II 12 oz/ac, April 15, 2010
Spring, None
Harvest: Fall, August 14, 2010
Spring, August 14, 2010

ANOVA
2010-10-12 05:00:27
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\10SpringPea.dt
.AOV Filename: 1WRB.AOV - 1 Way Randomized Blocks
Y Column: 4) DA Yield
1st Factor: 1) Variety
Blocks: 2) Rep
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 24

Source	df	Type III SS	MS	F	P	
Blocks	2	186130.3333	93065.167	1.1436335	.3467	ns
Main Effects						
Variety	7	2211081.167	315868.74	3.8815606	.0148	*
Error	14	1139274.333	81376.738<-			
Total	23	3536485.833				
Model	9	2397211.5	266356.83	3.2731323	.0232	*

R^2 = SSmodel/SStotal = 0.67785129447
Root MSerror = sqrt(MSerror) = 285.266082974
Mean Y = 1338.41666667
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 21.313698%

Compare Means
Factor: 1) Variety
Test: Tukey's HSD
Significance Level: 0.1
Variance: 81376.7380952
Degrees of Freedom: 14
Keep If:

n Means = 8
LSD 0.1 = 410.242210497
MSD 0.1 = 728.625941896

Rank	Mean Name	Mean	n	Non-significant ranges
1	Universal	1795	3	a
2	Windham-Spring	1750	3	ab
3	Cruiser	1612	3	ab
4	1146-Fall	1242	3	ab
5	180-Spring	1114	3	ab
6	Windham-Fall	1073	3	ab
7	1146-Spring	1068	3	ab
8	180-Fall	1053	3	b

Compare Means
Factor: 2) Rep
Test: Tukey's HSD
Significance Level: 0.1
Variance: 81376.7380952
Degrees of Freedom: 14
Keep If:

n Means = 3
LSD 0.1 = 251.221021667
MSD 0.1 = 318.505745525

Rank	Mean Name	Mean	n	Non-significant ranges
1	2	1463	8	a
2	3	1282	8	a
3	1	1270	8	a

Spring Wheat, Barley and Triticale Variety Yield Trials

Spring wheat and barley variety testing is also a priority area for CWGG. Spring wheat and barley crops have been an alternative crop in the CWGG area for a long time, either as a crop rotation with winter wheat or as a way to control winter annual weeds such as downy brome, feral rye and jointed goatgrass. Yields of spring wheat have been extremely variable because those yields are determined by the amount and timing of our spring rains. Generally, when spring wheat and barley fields receive normal to above normal rainfall they have higher than normal yields. This year, those crops did not respond as expected to the rainfall we received and had only average to slightly better than average yields. In addition, bushel test weights were low which is not normal in a wet year. Several theories have surfaced for what caused the low yields and bushel test weights. One theory is that the cold and wet spring conditions caused the roots to stay shallow not penetrating deeper into the soils, so that later during the grain fill, the crop suffered from a lack of moisture.

Several new varieties of spring triticale and barley are in our trials with several in their second year of testing. The comparative yield table on page 44 lists those varieties and are sorted by the two-year average yield column. The new spring triticale variety, TriMark™ 054, did not perform very well this year. Spring barley out yielded this variety as well as other spring triticale varieties. We will be looking for a new spring triticale variety in our trials next year.

Soft white spring wheat varieties continue to change with the release of another new soft white and a club wheat variety by WSU. Louise continues to perform well in our area, but a

Waterville Barley/Triticale Comparative Yield

Variety	Type	3-Year Average		2-Year Average		2010 Yield		2009 Yield	2008 Yield
Champion	Barley			1,912	(1)	3,296	(1)	528	
Bob	Barley			1,822	(2)	3,058	(3)	586	
Trical 118	Triticale			1,803	(3)	2,803	(5)	802	
Baronesse	Barley	1,695	(1)	1,750	(4)	3,267	(2)	232	1,587
Kent	Barley			1,699	(5)	3,047	(4)	351	
FL9707-01-H16	Triticale	1,422	(2)	1,095	(6)	1,748	(9)	442	2,076
Logo	Triticale			1,059	(7)	1,795	(8)	322	
TriMark 054	Triticale	1,253	(3)	962	(8)	1,382	(10)	542	1,835
07TN14362	Triticale					2,270	(6)		
FL00062-H6	Triticale					1,962	(7)		

Wilbur Barley/Triticale Comparative Yield

Variety	Type	3-Year Average		2-Year Average		2010 Yield		2009 Yield	2008 Yield
Logo	Triticale			2,345	(1)	2,792	(1)	1,898	
Kent	Barley			2,208	(2)	2,551	(3)	1,864	
Champion	Barley			2,161	(3)	2,479	(5)	1,843	
Trical 118	Triticale			2,079	(4)	2,478	(6)	1,679	
FL9707-01-H16	Triticale	1,619	(1)	2,054	(5)	2,563	(2)	1,545	749
Bob	Barley			2,012	(6)	2,137	(9)	1,886	
Baronesse	Barley	1,538	(2)	1,992	(7)	2,150	(8)	1,833	631
TriMark 054	Triticale	1,506	(3)	1,850	(8)	2,029	(10)	1,671	819
FL00062-H6	Triticale					2,546	(4)		
07TN14362	Triticale					2,273	(7)		

new variety Diva, yielded well in the first year it has been tested. A new club wheat, JD, also looks good in it's first year of testing. Both of these new varieties have resistance to the current races of stripe rust. A new DNS variety from WSU, Kelse, also has yielded well in our trials and has resistance to stripe rust.

We tested three Clearfield™ DNS wheat varieties in our trials this year and they are denoted by an asterisk. In their first year of testing, these varieties did not yield as high as our standard DNS varieties. We will continue testing these varieties so we can have a choice of crops to grow following applications of Beyond® herbicide to Clearfield™ winter wheat fields.

2010 WATERVILLE SPRING BARLEY/TRITICALE VARIETY TRIAL

Previous Crop: 2009 Winter Peas, 2008 Summer Fallow
Seeding Date: April 15, 2010
Seeding Rate: 70 lbs/acre
Fertility: Starter + Sol 32 & Thiosol, 40-10-0-10, April 15, 2010
Herbicide: Buctril, 1 pt/acre, May 12, 2010
            Chiptox, 1 pt/acre, May 12, 2010
Harvest: August 13, 2010

ANOVA
2010-10-08 04:23:54
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\CoStat10.dt
.AOV Filename: 1WRB.AOV - 1 Way Randomized Blocks
  Y Column: 3) WA Yield
  1st Factor: 1) Variety
  Blocks: 2) Rep
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 30

Source	df	Type III SS	MS	F	P	
Blocks	2	2097058.4	1048529.2	7.6636862	.0039	**
Main Effects						
Variety	9	13698874.7	1522097.2	11.124988	.0000	***
Error	18	2462721.6	136817.87<-			
Total	29	18258654.7				
Model	11	15795933.1	1435993.9	10.495661	.0000	***

R^2 = SSmodel/SStotal = 0.8651203147
Root MSerror = sqrt(MSerror) = 369.888992357
Mean Y = 2462.9
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 15.018433%

Compare Means
Factor: 1) Variety
Test: Tukey's HSD
Significance Level: 0.1
Variance: 136817.866667
Degrees of Freedom: 18
Keep If:

n Means = 10
LSD 0.1 = 523.709921239
MSD 0.1 = 972.531789386

Rank	Mean Name	Mean	n	Non-significant ranges
1	Champion	3296	3	a
2	Baronesse	3267	3	a
3	Bob	3058	3	ab
4	Kent	3047	3	ab
5	Trical 118	2803	3	abc
6	07TN14362	2270	3	bcd
7	FL00062-H6	1962	3	cd
8	Logo	1795	3	d
9	FL9707-01-H16	1748	3	d
10	TriMark 054	1382	3	d

Compare Means
Factor: 2) Rep
Test: Tukey's HSD
Significance Level: 0.1
Variance: 136817.866667
Degrees of Freedom: 18
Keep If:

n Means = 3
LSD 0.1 = 286.847737452
MSD 0.1 = 362.370487815

Rank	Mean Name	Mean	n	Non-significant ranges
1	3	2835	10	a
2	1	2311	10	b
3	2	2243	10	b

2010 WILBUR SPRING BARLEY/TRITICALE VARIETY

Previous Crop: 2009 Winter Wheat, 2008 Chemical Fallow
Seeding Date: March 30, 2010
Seeding Rate: 75 lbs/acre
Fertility: Starter + Sol 32 & Thiosol, 45-10-0-9, March 30, 2010
Herbicide: Buctril, 1 pt/acre, May 20, 2010
            Chiptox, 1 pt/acre, May 20, 2010
Harvest: August 13, 2010

ANOVA
2010-10-08 04:45:54
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\CoStat10.dt
.AOV Filename: 1WRB.AOV - 1 Way Randomized Blocks
  Y Column: 4) WB Yield
  1st Factor: 1) Variety
  Blocks: 2) Rep
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 30

Source	df	Type III SS	MS	F	P	
Blocks	2	9724.2	4862.1	0.0522527	.9492	ns
Main Effects						
Variety	9	1567794.8	174199.42	1.8721103	.1231	ns
Error	18	1674895.8	93049.767<-			
Total	29	3252414.8				
Model	11	1577519	143410.82	1.5412271	.2004	ns

R^2 = SSmodel/SStotal = 0.48503007673
Root MSerror = sqrt(MSerror) = 305.040598391
Mean Y = 2399.8
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 12.711084%

Compare Means
Factor: 1) Variety
Test: Tukey's HSD
Significance Level: 0.1
Variance: 93049.7666667
Degrees of Freedom: 18
Keep If:

n Means = 10
LSD 0.1 = 431.89386832
MSD 0.1 = 802.028946842

Rank	Mean Name	Mean	n	Non-significant ranges
1	Logo	2792	3	a
2	FL9707-01-H16	2563	3	a
3	Kent	2551	3	a
4	FL00062-H6	2546	3	a
5	Champion	2479	3	a
6	Trical 118	2478	3	a
7	07TN14362	2273	3	a
8	Baronesse	2150	3	a
9	Bob	2137	3	a
10	TriMark 054	2029	3	a

Compare Means
Factor: 2) Rep
Test: Tukey's HSD
Significance Level: 0.1
Variance: 93049.7666667
Degrees of Freedom: 18
Keep If:

n Means = 3
LSD 0.1 = 236.558014127
MSD 0.1 = 298.840227004

Rank	Mean Name	Mean	n	Non-significant ranges
1	1	2424	10	a
2	3	2394	10	a
3	2	2381	10	a

Waterville Spring Wheat Comparative Yield

Variety	*Class*	*3-Year Average*		*2-Year Average*		*2010*				*2009*		*2008*	
						Yield		*TW*	*Protein*	*Yield*	*Protein*	*Yield*	*Protein*
Eden	Club	26.3	(1)	24.5	(2)	40.3	(2)	48.8	12.6	8.6	13.0	30.0	11.7
Louise	SWH	25.3	(2)	23.0	(4)	31.6	(11)	44.8	14.2	14.4	13.1	29.9	12.3
Nick	SWH	25.2	(3)	23.5	(3)	38.5	(3)	45.7	14.2	8.5	14.0	28.7	12.8
BR 7030	HW	24.7	(4)	26.0	(1)	44.8	(1)	50.0	13.9	7.1	16.1	22.3	15.0
Whit	SWH	24.7	(5)	22.4	(5)	34.6	(7)	44.0	14.1	10.1	13.4	29.4	13.2
Babe	SWH	24.5	(6)	21.3	(7)	31.3	(12)	47.6	13.7	11.2	13.8	31.1	13.2
Kelse	DNS	23.5	(7)	19.8	(9)	33.1	(9)	50.3	15.8	6.4	16.3	30.9	15.2
Hank	DNS	23.0	(8)	21.5	(6)	36.0	(5)	49.0	14.5	7.0	15.6	26.0	14.9
Bullseye	DNS	22.7	(9)	19.3	(10)	33.5	(8)	52.9	13.9	5.1	15.6	29.5	14.1
Tara 2002	DNS	19.6	(10)	17.4	(11)	28.8	(13)	48.8	14.2	5.9	15.7	24.2	14.6
Hollis	DNS	18.8	(11)	13.6	(12)	17.5	(16)	44.6	16.3	9.6	15.2	29.2	15.6
JD	Club			20.0	(8)	32.6	(10)	52.0	13.4	7.4	13.8		
Diva	SWH					36.8	(4)	46.0	13.3				
Jedd*	DNS					35.4	(6)	47.7	14.8				
604 CL2*	DNS					25.6	(14)	48.1	14.4				
605 CL2*	DNS					22.8	(15)	45.3	15.6				

* - Clearfield™ Wheat Type

2010 WATERVILLE SPRING WHEAT VARIETY TRIAL

Previous Crop: 2009 Winter Peas, 2008 Summer Fallow
Seeding Date: April 15, 2010
Seeding Rate: 70 lbs/acre
Fertility: Starter + Sol 32 & Thiosol, April 15, 2010
              Soft White Wheat, 40-10-0-10
              Hard White, 40-10-0-10
              Hard Red Spring, 40-10-0-10
Herbicide: Buctril, 1 pt/acre, May 12, 2010
            Chiptox, 1 pt/acre, May 12, 2010
Harvest: August 13, 2010

ANOVA
2010-10-06 04:48:35
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\CoStat10.dt
.AOV Filename: 1WRB.AOV - 1 Way Randomized Blocks
  Y Column: 3) WA Yield
  1st Factor: 1) Variety
  Blocks: 2) Rep
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 48

Source	df	Type III SS	MS	F	P	
Blocks	2	205.5929167	102.79646	2.5006563	.0990	ns
Main Effects						
Variety	15	2020.1925	134.6795	3.2762524	.0028	**
Error	30	1233.23375	41.107792<-			
Total	47	3459.019167				
Model	17	2225.785417	130.92855	3.1850058	.0027	**

R^2 = SSmodel/SStotal = 0.64347299319
Root MSerror = sqrt(MSerror) = 6.41153582745
Mean Y = 32.7041666667
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 19.604645%

Compare Means
Factor: 1) Variety
Test: Tukey's HSD
Significance Level: 0.1
Variance: 41.1077916667
Degrees of Freedom: 30
Keep If:

n Means = 16
LSD 0.1 = 8.88515578805
MSD 0.1 = 17.8792203504

Rank	Mean Name	Mean	n	Non-significant ranges
1	7030	44.8	3	a
2	Eden	40.3	3	ab
3	Nick	38.5	3	ab
4	Diva	36.8	3	ab
5	Hank	36.0	3	ab
6	Jedd	35.4	3	ab
7	Whit	34.6	3	abc
8	Bullseye	33.5	3	abc
9	Kelse	33.1	3	abc
10	JD	32.6	3	abc
11	Louise	31.6	3	abc
12	Babe	31.3	3	abc
13	Tara 2002	28.8	3	abc
14	604 CL2	25.6	3	bc
15	605 CL2	22.8	3	bc
16	Hollis	17.5	3	c

Compare Means
Factor: 2) Rep
Test: Tukey's HSD
Significance Level: 0.1
Variance: 41.1077916667
Degrees of Freedom: 30
Keep If:

n Means = 3
LSD 0.1 = 3.84738531452
MSD 0.1 = 4.83590089785

Rank	Mean Name	Mean	n	Non-significant ranges
1	3	35.6	16	a
2	2	31.7	16	a
3	1	30.9	16	a

Wilbur Spring Wheat Comparative Yield

Variety	*Class*	*3-Year Average*		*2-Year Average*		*2010**				*2009*		*2008*	
						Yield		*TW*	*Protein*	*Yield*	*Protein*	*Yield*	*Protein*
Kelse	DNS	30.6	(1)	34.6	(1)	41.1	(5)	58.2	15.4	28.0	14.0	22.8	16.7
Hank	DNS	27.6	(2)	34.1	(3)	41.9	(2)	53.3	15.7	26.2	14.3	14.8	16.0
Tara 2002	DNS	27.6	(3)	33.7	(4)	44.3	(1)	53.9	15.6	23.0	14.9	15.6	16.2
Hollis	DNS	27.1	(4)	30.1	(10)	35.6	(12)	51.7	15.9	24.6	14.6	21.2	16.0
BR 7030	HW	25.9	(5)	33.0	(6)	35.7	(11)	52.6	15.5	30.3	13.6	11.7	15.8
Bullseye	DNS	25.5	(6)	33.3	(5)	37.4	(8)	58.8	15.0	29.1	13.9	9.9	16.9
Nick	SWH	25.4	(7)	34.4	(2)	41.2	(4)	51.5	14.2	27.6	11.7	7.5	14.2
Babe	SWH	24.1	(8)	32.0	(8)	35.4	(13)	51.9	14.3	28.5	10.9	8.5	15.0
Whit	SWH	23.8	(9)	31.7	(9)	37.4	(9)	50.4	15.2	25.9	11.9	8.1	15.0
Louise	SWH	23.1	(10)	28.9	(12)	33.3	(14)	52.0	13.6	24.4	11.3	11.5	14.8
Eden	Club	22.5	(11)	29.9	(11)	36.9	(10)	55.6	12.9	22.8	11.5	7.7	15.0
JD	Club			32.5	(7)	39.2	(7)	62.1	14.4	25.8	11.8		
Jedd*	DNS					41.3	(3)	56.5	15.1				
Diva	SWH					40.1	(6)	52.2	13.4				
605 CL2*	DNS					32.5	(15)	60.5	16.0				
604 CL2*	DNS					30.8	(16)	53.9	15.6				

2010* - Plot had 7% Hail Damage

* - Clearfield™ Wheat Type

2010 WILBUR SPRING WHEAT VARIETY TRIAL

Previous Crop: 2009 Winter Wheat, 2008 Chemical Fallow
Seeding Date: March 30, 2010
Seeding Rate: 70 lbs/acre
Fertility: Starter + Sol 32 & Thiosol, April 15, 2010
              Soft White Wheat, 45-10-0-9
              Hard White, 45-10-0-9
              Hard Red Spring, 45-10-0-13
Herbicide: Buctril, 1 pt/acre, May 12, 2010
            Huskie, 1 pt/acre, June 2, 2010
Harvest: August 18, 2010

ANOVA
2010-10-06 05:04:02
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\CoStat10.dt
.AOV Filename: 1WRB.AOV - 1 Way Randomized Blocks
  Y Column: 4) WB Yield
  1st Factor: 1) Variety
  Blocks: 2) Rep
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 48

Source	df	Type III SS	MS	F	P	
Blocks	2	16.31625	8.158125	0.4974563	.6130	ns
Main Effects						
Variety	15	645.9314583	43.062097	2.6257888	.0119	*
Error	30	491.9904167	16.399681	<-		
Total	47	1154.238125				
Model	17	662.2477083	38.955748	2.3753967	.0186	*

R^2 = SSmodel/SStotal = 0.57375310518
Root MSerror = sqrt(MSerror) = 4.04965190548
Mean Y = 37.75625
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 10.725779%

Compare Means
Factor: 1) Variety
Test: Tukey's HSD
Significance Level: 0.1
Variance: 16.3996805556
Degrees of Freedom: 30
Keep If:

n Means = 16
LSD 0.1 = 5.61203883686
MSD 0.1 = 11.2928665937

Rank	Mean Name	Mean	n	Non-significant ranges
1	Tara 2002	44.3	3	a
2	Hank	41.9	3	ab
3	Jedd	41.3	3	ab
4	Nick	41.2	3	ab
5	Kelse	41.1	3	ab
6	Diva	40.1	3	ab
7	JD	39.2	3	ab
8	Bullseye	37.4	3	ab
9	Whit	37.4	3	ab
10	Eden	36.9	3	ab
11	7030	35.7	3	ab
12	Hollis	35.6	3	ab
13	Babe	35.4	3	ab
14	Louise	33.3	3	ab
15	605 CL2	32.5	3	b
16	604 CL2	30.8	3	b

Compare Means
Factor: 2) Rep
Test: Tukey's HSD
Significance Level: 0.1
Variance: 16.3996805556
Degrees of Freedom: 30
Keep If:

n Means = 3
LSD 0.1 = 2.43008409987
MSD 0.1 = 3.05444994971

Rank	Mean Name	Mean	n	Non-significant ranges
1	2	38.2	16	a
2	3	38.1	16	a
3	1	36.9	16	a

Safflower Variety Yield Trials

Safflower is a crop that shows potential for our area. It is the one of the few warm season crops we have tested that has yielded well, but several issues have kept it from moving out of our testing program.

The first issue is safflower lacks a local market. At the current time there is a small bird seed market in the Spokane area, but the major market for safflower is in California for crushing into cooking oil. The bird seed market is too small to handle a large acreage and the distance to the California market makes the freight cost too high for it to be a viable market.

The second issue is safflower lacks weed control options. The only broadleaf herbicide registered for safflower is Sonalan®. While it has activity on several weed species in our area, it is weak on the mustard species of weeds. In addition, it looses it's residual activity in 30 to 45 days. Safflower is not a very competitive crop, so about the time that the Sonalan® looses it's effectiveness, Russian thistle and kochia start to germinate. These weeds can become major problems by harvest time. We have hand weeded our trials because the russian thistle and prickly lettuce would interfere with harvesting our plots and would make our data inaccurate. The control of weeds with hand weeding doesn't accurately reflect the conditions that growers would experience.

The last issue of safflower production is the long growing season required for safflower to reach maturity. Many years the safflower is not ready to be harvested until the middle of October. Usually by this time our weather is changing and we are receiving our fall rain showers. In addition, the day time temperatures have dropped and the hours we can harvest each day is low. While we can easily harvest a test plot in several hours, growers could experience problems trying to harvest a hundred acres of safflower.

Because of these issues, we have decided to discontinue safflower trials in the CWGG testing program.

Wilbur Safflower Comparative Yield

Variety	*3-Year Average*		*2-Year Average*		*2010*			*2009*		*2008*	
					Yield	*Oil*	*Rank*	*Yield*		*Yield*	
3151	712	(1)	946	(2)	1,162		(1)	729	(8)	246	(1)
S-345	667	(2)	907	(4)	1,162		(2)	652	(12)	188	(4)
Gila	643	(3)	916	(3)	871		(6)	961	(2)	96	(7)
S-317	618	(4)	884	(5)	830		(8)	938	(4)	85	(8)
4409			996	(1)	830		(9)	1,162	(1)		
7313			873	(6)	788		(10)	957	(3)		
S-719			849	(7)	913		(4)	785	(5)		
3125			833	(8)	913		(5)	753	(7)		
2106			832	(9)	996		(3)	667	(10)		
S-334			767	(10)	871		(7)	663	(11)		

2010 WILBUR SPRING SAFFLOWER VARIETY TRIAL

Previous Crop: 2009 Winter Wheat, 2008 Summer Fallow
Seeding Date: March 30, 2010
Seeding Rate: 35 lbs/acre
Fertility: Starter + Sol 32 & Thiosol, 80-10-0-20, March 30, 2010
Herbicide: None
Harvest: October 6, 2010

ANOVA
2010-10-11 15:17:52
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\CoStat10.dt
.AOV Filename: 1WRB.AOV - 1 Way Randomized Blocks
  Y Column: 3) WB Yield
  1st Factor: 1) Variety
  Blocks: 2) Rep
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 30

Source	df	Type III SS	MS	F	P	
Blocks	2	230594.8667	115297.43	2.316011	.1273	ns
Main Effects						
Variety	9	531945.5	59105.056	1.1872594	.3598	ns
Error	18	896089.8	49782.767<-			
Total	29	1658630.167				
Model	11	762540.3667	69321.852	1.3924869	.2573	ns

R^2 = SSmodel/SStotal = 0.45974104535
Root MSerror = sqrt(MSerror) = 223.120520497
Mean Y = 950.166666667
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 23.482251%

Compare Means
Factor: 1) Variety
Test: Tukey's HSD
Significance Level: 0.1
Variance: 49782.7666667
Degrees of Freedom: 18
Keep If:

n Means = 10
LSD 0.1 = 315.906752108
MSD 0.1 = 586.640325966

Rank	Mean Name	Mean	n	Non-significant ranges
1	3151	1162	3	a
2	S-345	1162	3	a
3	S-719	1079	3	a
4	2106	996	3	a
5	3125	913	3	a
6	S-334	871	3	a
7	Gila	871	3	a
8	4409	830	3	a
9	S-317	830	3	a
10	7313	788	3	a

Compare Means
Factor: 2) Rep
Test: Tukey's HSD
Significance Level: 0.1
Variance: 49782.7666667
Degrees of Freedom: 18
Keep If:

n Means = 3
LSD 0.1 = 173.029254198
MSD 0.1 = 218.585287815

Rank	Mean Name	Mean	n	Non-significant ranges
1	2	1046	10	a
2	1	971	10	a
3	3	834	10	a

Chickpea Variety Yield Trials

Chickpeas are a crop that have potential to be grown in our area. For the second year in our testing program, chickpeas have yielded well.

In contrast to the issues that have stopped safflower testing, chickpeas do not have those limitations. First, we have a local market for chickpeas. Chickpea production in Washington has grown the past few years and Whitman county has the majority of those acres. We have crop protection products labeled for use on chickpea production. The number of these products is limited, but adequate. The growing season required for chickpeas is longer than spring wheat, but we have been able to reach maturity by the middle of September. This provides adequate time to harvest chickpeas before the fall weather deteriorates.

Because of this crops potential to be grown in our area, we will continue to test this crop.

Wilbur Chickpea Comparative Yield

Variety	3-Year Average	2-Year Average		2010 Yield	2010 Rank	2009 Yield		2008 Yield	
CA0469C020C		1,033	(1)	1,149	(2)	917	(3)		
CA04900421C		1,007	(2)	995	(5)	1,019	(1)		
CA04900851C		966	(3)	1,002	(4)	930	(2)		
Dwelley		836	(4)	824	(8)	848	(4)		
Dylan		823	(5)	883	(7)	762	(5)		
Sierra		691	(6)	687	(9)	694	(6)		
Troy		631	(7)	671	(10)	590	(7)		
CA04900843C				1,396	(1)				
CA0469C025C				1,134	(3)				
CA0690B0250C				964	(6)				

Wilke Chickpea Comparative Yield

Variety	3-Year Average	2-Year Average		2010 Yield		2009 Yield		2008 Yield	
CA04900421C		1,009	(1)	1,118	(1)	899	(4)		
CA04900851C		896	(2)	508	(5)	1,283	(1)		
CA0469C020C		889	(3)	928	(3)	849	(5)		
Dwelley		705	(4)	457	(7)	952	(2)		
Troy		670	(5)	491	(6)	848	(6)		
Dylan		591	(6)	265	(9)	917	(3)		
Sierra		526	(7)	242	(10)	810	(7)		
CA0469C025C				1,006	(2)				
CA04900843C				633	(4)				
CA0690B0250C				303	(8)				

2010 WILBUR SPRING CHICKPEA VARIETY TRIAL

Previous Crop: 2009 Winter Wheat, 2008 Chemical Fallow
Seeding Date: March 30, 2010
Seeding Rate: Variable to Achieve 4 plants/ft2
Fertility: Starter,10-20-0-12, March 30, 2010
Herbicide: None
Harvest: September 3, 2010

ANOVA
2010-10-11 14:44:44
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\CoStat10.dt
.AOV Filename: 1WRB.AOV - 1 Way Randomized Blocks
  Y Column: 3) WB Yield
  1st Factor: 1) Variety
  Blocks: 2) Rep
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 30

Source	df	Type III SS	MS	F	P	
Blocks	2	319401.6	159700.8	4.6469199	.0236	*
Main Effects						
Variety	9	1320369.2	146707.69	4.2688508	.0043	**
Error	18	618606.4	34367.022<-			
Total	29	2258377.2				
Model	11	1639770.8	149070.07	4.3375906	.0030	**

R^2 = SSmodel/SStotal = 0.72608366751
Root MSerror = sqrt(MSerror) = 185.383446462
Mean Y = 970.4
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 19.103818%

Compare Means
Factor: 1) Variety
Test: Tukey's HSD
Significance Level: 0.1
Variance: 34367.0222222
Degrees of Freedom: 18
Keep If:

n Means = 10
LSD 0.1 = 262.476451454
MSD 0.1 = 487.420006099

Rank	Mean Name	Mean	n	Non-significant ranges
1	CA04900843C	1396	3	a
2	CA0469C020C	1149	3	ab
3	CA0469C025C	1134	3	ab
4	CA04900851C	1002	3	ab
5	CA04900421C	995	3	ab
6	CA0690B0250C	964	3	ab
7	Dylan	883	3	b
8	Dwelley	824	3	b
9	Sierra	687	3	b
10	Troy	671	3	b

Compare Means
Factor: 2) Rep
Test: Tukey's HSD
Significance Level: 0.1
Variance: 34367.0222222
Degrees of Freedom: 18
Keep If:

n Means = 3
LSD 0.1 = 143.764273275
MSD 0.1 = 181.615271921

Rank	Mean Name	Mean	n	Non-significant ranges
1	3	1102	10	a
2	2	959	10	ab
3	1	850	10	b

2010 WILKE SPRING CHICKPEA VARIETY TRIAL

Previous Crop: 2009 Chemical Fallow, 2008 Spring Wheat
Seeding Date: April 15, 2010
Seeding Rate: Variable to Achieve 4 plants/ft2
Fertility: Starter, 10-20-0-12, April 15, 2010
Herbicide: Pre-Emergent, Roundup 3% Sol, April 15, 2010
            Assure II, 12 oz/ac, May 29, 2010
Harvest: September 13, 2010

ANOVA
2010-10-11 15:00:45
Using: C:\Documents and Settings\user\My Documents\Test Plots\2010\CoStat10.dt
.AOV Filename: 1WRB.AOV - 1 Way Randomized Blocks
  Y Column: 4) DA Yield
  1st Factor: 1) Variety
  Blocks: 2) Rep
Keep If:

Rows of data with missing values removed: 0
Rows which remain: 30

Source	df	Type III SS	MS	F	P	
Blocks	2	320329.8	160164.9	2.6361213	.0991	ns
Main Effects						
Variety	9	2733904.7	303767.19	4.9996419	.0018	**
Error	18	1093640.2	60757.789<-			
Total	29	4147874.7				
Model	11	3054234.5	277657.68	4.5699109	.0022	**

R^2 = SSmodel/SStotal = 0.73633721385
Root MSerror = sqrt(MSerror) = 246.490950927
Mean Y = 595.1
Coefficient of Variation = (Root MSerror) / abs(Mean Y) * 100% = 41.420089%

Compare Means
Factor: 1) Variety
Test: Tukey's HSD
Significance Level: 0.1
Variance: 60757.7888889
Degrees of Freedom: 18
Keep If:

n Means = 10
LSD 0.1 = 348.995939764
MSD 0.1 = 648.087103228

Rank	Mean Name	Mean	n	Non-significant ranges
1	CA04900421C	1118	3	a
2	CA0469C025C	1006	3	ab
3	CA0469C020C	928	3	abc
4	CA04900843C	633	3	abcd
5	CA04900851C	508	3	abcd
6	Troy	491	3	abcd
7	Dwelley	457	3	bcd
8	CA0690B0250C	303	3	cd
9	Dylan	265	3	d
10	Sierra	242	3	d

Compare Means
Factor: 2) Rep
Test: Tukey's HSD
Significance Level: 0.1
Variance: 60757.7888889
Degrees of Freedom: 18
Keep If:

n Means = 3
LSD 0.1 = 191.152948687
MSD 0.1 = 241.480681975

Rank	Mean Name	Mean	n	Non-significant ranges
1	3	727	10	a
2	2	583	10	ab
3	1	475	10	b

CRP Take-Out Variety Yield Trials

In 2009, FSA announced that CRP acreage in Douglas county would be reduced to a level equal to 15% of total cropped acreage. This meant that many CRP contracts would not be renewed. Growers with expiring CRP contracts were faced with decisions of how to prepare those fields for planting. This would require destruction of the grasses, forbs and shrubs that were growing in those fields. In addition, should a spring or winter crop be planted and what variety would be the best. We decided to plant some strip trials in Douglas county to assist in those decisions. We planted three trials in the fall of 2009. Three triticale varieties, three soft white wheat varieties, one club wheat variety, three Clearfield™ wheat varieties and two winter pea varieties were chosen to be planted at each location. At Supplee and Withrow the plots were seeded into dry soil, but the Del Rio plot received a rain in August and had moisture in the seed zone. The trial at Supplee didn't emerge until rain was received later that fall. The trial at Withrow received a hard rain after it was planted and it crusted. It was reseeded in the spring to different varieties of spring crops. The trial at Del Rio emerged well after it was planted. In addition to the reseeded Withrow spring trial, a spring trial was located in the Mansfield area. The spring trials were planted to two varieties of soft white spring wheat, one variety of spring club wheat, five varieties of DNS wheat of which two were Clearfield™ spring wheat types, two barley varieties and two spring triticale varieties. Numerous weeds germinated in the trials in addition to some of the range grasses that survived the CRP tillage. A unusual weed that was prevalent in the trials was lupine.

There were two key learning's from these trials. The first was that good weed control in the first year is the over riding factor when choosing the best crop to plant.

2010 CWGG Winter CRP Test Plots

Name	Crop	Supplee	Del Rio
TriMark 095	Triticale	872	1863
TriMark 099	Triticale	1077	1838
TriMark 336	Triticale	630	1291
Triticale Ave		***860***	***1664***
Xerpha	Soft White Wheat	23.3	39.5
George	Soft White Wheat	16.5	33.6
Eltan	Soft White Wheat	19.7	30.5
ORCF 103*	Soft White Wheat	10.3	29.9
Bruehl	Club Wheat	17.5	28.3
503 CL2*	Hard Red Winter	20.2	17.6
Imi Bruehl*	Club Wheat	17.2	17.0
Wheat Ave		***17.8***	***28.1***
180	Winter Pea		1017
Windham	Winter Pea		732
* Clearfield Wheat Variety			

Winter wheat sprayed for broadleaf weeds.

Clearfield™ Winter wheat sprayed with Beyond®.

The picture at the top of this page shows the border between the conventional wheat varieties and the Clearfield™ wheat varieties at the Del Rio trial. The pictures at the top of this page show the Clearfield™ wheat types on the right sprayed with Beyond® herbicide and the picture on the left shows the conventional wheat varieties sprayed for broadleaf weeds. I would strongly recommend that the first crop be a Clearfield™ wheat variety either for fall or spring planting. While down brome can be controlled before the spring crop is planted, the application of Beyond™ herbicide suppressed the uncontrolled range grasses in the trial. The winter peas in the trials were not competitive with the weeds that were present and would not be recommended. The winter triticale performed well, but the improved weed control in the Clearfield™ wheat crop made that the better choice. The winter trial at Del Rio had the best overall yield with the winter wheat averaging 28.0 bu/acre. This trial yielded better because there was moisture present at seeding time and the winter wheat emerged and became established earlier that the Supplee trial where the winter wheat averaged 17.8 bu/acre. This can be compared to the spring wheat trials that averaged 26.4 bu/acre at Withrow and 23.4 bu/acre at Mansfield. This was only slightly lower than the average of the best winter wheat trial and better than the late emerged winter wheat trial.

2010 CWGG Spring CRP Test Plots

Name	Crop	Mansfield	Withrow
Kelse	DNS	23.5	30.0
Eden	Club Wheat	29.1	29.7
Tara	DNS	23.2	29.0
Bullseye	DNS	22.4	27.3
605 CL2*	DNS	21.5	26.6
Diva	Soft White Wheat	21.9	23.8
604 CL2*	DNS	20.0	22.9
Louise	Soft White Wheat	25.7	21.7
Wheat Ave		***23.4***	***26.4***
Baronesse	Barley	1379	1874
Bob	Barley	1061	1859
Barley Ave		***1220***	***1867***
TriMark 054	Triticale	705	1387
Trical 118	Triticale	967	x
Triticale Ave		***836***	***1387***
* Clearfield Wheat Variety			