2017

OHIO FORAGE PERFORMANCE TRIALS

C O N T E N T S:

SUMMARY

This report is a summary of performance data collected from forage variety trials in Ohio during 2017, including commercial varieties of alfalfa, orchardgrass, tall fescue annual ryegrass and cover crops in tests planted in 2014 to 2017 across three sites in Ohio: South Charleston, Wooster, and North Baltimore. For more details on forage species and management, see the *Ohio Agronomy Guide*, Ohio State University Extension Bulletin 472, which can be purchased from Ohio State University Extension's eStore at http://estore.osu-extension.org/.

Interpreting Yield Data

Yield data are reported in Tables 2 through 10. Details of establishment and management of each test are listed in footnotes below Tables 3 to 10. Least significant differences (LSD) are listed at the bottom of data columns in Tables 3 through 10. Differences between varieties are significant only if they are equal to or greater than the LSD value. If a given variety yields more than another variety by as much or more than the LSD value, then we are 95% sure that the yield difference is real, with only a 5% probability that the difference is due to chance alone. For example, if variety X is 0.50 ton/acre higher in yield than variety Y, then this difference is statistically significant if the LSD is 0.50 or less.

The CV value or coefficient of variation, listed at the bottom of each table is used as a measure of the precision of the experiment. Lower CV values will generally relate to lower experimental error in the trial. Uncontrollable or unmeasured variations in soil fertility, soil drainage, and other environmental factors contribute to greater experimental error and higher CV values. However, higher CV values can also occur simply as a result of the mean yield being low (eg. due to weather conditions), because the CV is a function of the mean yield. So a higher CV will often occur where yields are low despite there being no increase in experimental error.

Results reported here should be representative of what might occur throughout the state but would be most applicable under environmental and management conditions similar to those of the tests. The relative yields of all forage legume varieties are affected by crop management and by environmental factors including soil type, winter conditions, soil moisture conditions, diseases, and insects.

ALFALFA

Alfalfa has the highest combined yield and quality potential of any adapted perennial forage grown in Ohio. It is grown on about 310,000 acres. Alfalfa requires well-drained soils with near-neutral pH (6.5-7.0). Alfalfa trials are initiated each year and data is collected for at least four years unless the stand becomes so depleted that further testing is no longer worthwhile; variety performance should be evaluated over several sites and years.

Guidelines for Selecting Alfalfa Varieties

To capitalize on alfalfa's potential, select high-yielding varieties with resistance to major diseases. Alfalfa variety rankings for a number of traits described below are reported on the National Alfalfa & Forage Alliance webpage at https://www.alfalfa.org/. Click on the "Education" tab along the top of the page. Consider these factors when selecting alfalfa varieties for Ohio:

1. **Yield.** Yield is critical to profitability of an alfalfa stand. Select varieties with high yields over several locations and years. Table 2 shows this comparison in percent of the average test yield. Varieties that perform equally well across several locations and years are adapted to a wider range of environmental conditions, which is important because soils may vary on your farm and weather conditions vary from year to year.

2. **Persistence.** Another important consideration is how long the alfalfa stand will last. Study variety performance by age of stand to get an estimate of longevity of productivity. Some varieties may decline with age more rapidly than others, which may influence your variety choice depending on how long you intend to keep the stand. For long-term rotations, choose varieties with good disease resistance and good performance in the fourth year. If you plan to harvest alfalfa for three years or less, then high performance during the first three years should be given priority.

3. **Fall dormancy (FD).** Alfalfa varieties with fall dormancy ratings of 1 through 5 are considered adequately winter hardy for Ohio conditions while those of 6 or higher are not considered adapted. Varieties with higher fall dormancy ratings tend to grow at a lower temperature, so they begin growth earlier in the spring and continue growth later into the fall. The fall dormancy rating does not correlate well with winter hardiness within the range of varieties adapted to the Midwest USA.

4. **Disease resistance.** Variety selection based on yield performance alone is less satisfactory than selections that also consider disease resistance characteristics. Resistance to specific disease-causing pathogens may be the most important attribute in an alfalfa variety. Pathogens can dramatically reduce yield and persistence of susceptible varieties. In an evaluation of older versus newer alfalfa varieties we found that newer varieties yielded more and persisted longer than older varieties, primarily because of improved resistance to diseases. For more information on alfalfa diseases, go to http://oardc.osu.edu/ohiofieldcropdisease/t01_pageview2/Home.htm .

5. **Insect resistance.** Alfalfa varieties have been developed for resistance to potato leafhopper (PLH), which is the most consistently damaging insect pest of alfalfa in Ohio. The PLH resistant varieties are not resistant to the alfalfa weevil, and they will need to be protected from that pest like all standard alfalfa varieties when weevil populations exceed the economic action threshold. For more information on these two important pests of alfalfa, see http://ohioline.osu.edu/factsheet/ENT-32 and http://ohioline.osu.edu/factsheet/ENT-33.

6. **Compare to check variety.** For comparisons of varieties across several trials, always compare varieties to the same check variety planted within the trial. The variety Vernal is used as a check in all Ohio trials and is commonly included in trials in other states. Another good way to compare varieties across trials is to look at their yield in relation to the trial average reported in Table 2.

7. **Use good management.** No variety can produce well under poor management. Good management considers all aspects of alfalfa production: seed bed preparation, liming and fertilization, seeding, pest control, harvest, storage, and post-harvest treatment. Many newer varieties are better adapted to intensive management.

Summary of 2017 Crop Conditions

Rainfall was quite variable across the three locations with August and September below normal for all three locations. Total rainfall for the growing season was below normal at Wooster but above normal for South Charleston and North Baltimore. Average monthly temperatures were above normal for most of the year except for August which was well below normal.

Table 1:

Weather 2017

	Wooster		S. Charleston		N. Baltimore	
Month	Total	DFA*	Total	DFA*	Total	DFA*
	Precipitation (inches of rainfall)					
	total	DFA	total	DFA	total	DFA
Apr	3.11	0.19	3.39	-0.61	2.79	-0.51
May	5.01	1.11	5.52	0.92	5.23	1.83
June	3.75	-0.15	4.30	0.10	5.12	1.52
July	4.40	0.30	7.44	3.34	5.91	2.11
Aug	1.16	-2.44	2.62	-0.88	4.36	1.36
Sept	1.18	-1.92	1.75	-1.25	1.86	-0.84
Oct	2.84	0.54	3.40	1.10	2.75	0.45
Total	21.45	-2.37	28.42	2.72	28.02	5.92
	Average Daily Temperature (°F)					
Apr	55.4	7.3	51.0	5.9	48.9	6.1
May	58.5	0.0	61.0	0.3	59.2	-0.6
June	69.0	1.4	70.3	0.0	71.0	1.5
July	71.9	0.4	72.8	-1.0	72.7	-0.1
Aug	68.3	-1.6	69.0	-3.0	68.1	-2.4
Sept	64.1	0.7	64.9	-0.3	65.5	1.5
Oct	55.9	3.7	56.6	2.7	57.3	4.8

*DFA = departure from long-term average

Alfalfa

The 2016 seeding at Wooster had the highest yields, averaging 7.92 tons/acre followed closely by the 2015 fall seeding at N. Baltimore at 7.55 tons/acre. Lower yields were harvested from the 2014 seeding at S. Charleston (3.49 tons/acre). Primarily because first harvest yields were not included due to high variability in the spring growth from heavy rainfall. A new spring seeding at S. Charleston was seeded on 25-April. Insecticide applications were used at all locations for control of potato leafhopper (PLH) and to control alfalfa weevil at South Charleston and North Baltimore in the spring.

Table 2:

Summary of Alfalfa Variety Performance in Ohio

Standard Trials - Insecticide applied (values are yield as a percent of the trial average)

		South Charleston		North Baltimore	Wooster	Total	Avg all
Variety	Marketers	2014-17	2017	2015-17	2016-17	site-yrs	site yrs
54QR04	Pioneer		109			1	109
55Q27	Pioneer	106		106	100	8	104
55VR06	Pioneer	107		96		6	103
55VR08	Pioneer				100	2	100
BlueJay HR	Blue River Hybrids			93		2	93
Caliber	Beck's Hybrids	97		94		6	96
Contender	Beck's Hybrids	97		95		6	96
Enduro Elite	The Cisco Companies	96				4	96
Fierce	Beck's Hybrids	91		102		6	95
FSG 403 LR	Farm Science Genetics	108				4	108
FSG 415 BR	Farm Science Genetics					1	112
FSG 424	Farm Science Genetics	105	112			4	105
FSG 426	Farm Science Genetics			101		2	101
FSG 524	Farm Science Genetics	95				4	95
GA-497-HD	Preferred Alfalfa Genetics				99	2	99
Kingbird	Blue River Hybrids					1	78
KF 406 A2	Byron Seeds		78		97	2	97
KF 425 HD	Byron Seeds				101	2	101
L-455 HD	Legacy Seeds	96				4	96
Lightning Bolt	Preferred Seed Company				100	2	100
Mallard 5	Blue River Hybrids			103		2	103
Mariner IV	Allied Seed	107				4	107
Persist III	Doeblers PA Hybrids	104		111	100	8	105
Pluss III	Doeblers PA Hybrids			99	101	4	100
Quail	Blue River Hybrids					1	104
Red Falcon	Blue River Hybrids		104	97		2	97
Rebound 6XT	Croplan Genetics				98	2	98
Roadrunner	Blue River Hybrids			99		2	99
Robin	Blue River Hybrids					1	93
SW 5113	S & W Seed Co.		93	101		2	101
SW 5213	S & W Seed Co.			110		2	110
SW5512 Y	S & W Seed Co.			105		2	105
SW 5909	S & W Seed Co.			88		2	88
VERNAL	Public	91		100	100	8	95
WL356 HQ.RR	W-L Research					1	99
WL 365 HQ	W-L Research		99		104	2	104
Trial Mean		3.49	2.97	5.08	7.92	--	--
No. site years		4	1	2	2	--	--

Table 3:

Alfalfa Variety Trial

Ohio, South Charleston, Sown 5-20-2014

Variety	26-Jun	27-Jul	8-Sep	Total 2017**	2016	2015	2014	2014-17	% Stand
Released Cultivars:	---------- Tons Dry Matter/Acre ----------								9/18/2017
55Q27	1.54	1.29	1.00	3.84	7.19	7.06	1.47	18.59	78
55VR06	1.58	1.25	0.91	3.74	7.26	7.16	1.57	18.80	77
Caliber	1.44	1.14	0.82	3.40	6.47	6.84	1.28	17.13	68
Contender	1.40	1.21	0.86	3.47	6.15	6.78	1.48	17.01	68
Enduro Elite	1.34	1.12	0.87	3.33	6.27	6.68	1.38	16.82	70
Fierce	1.35	1.15	0.81	3.32	5.63	6.73	1.26	16.11	65
FSG 403 LR	1.45	1.20	0.85	3.50	7.45	7.32	1.63	19.03	70
FSG 424	1.80	1.33	0.91	4.03	7.23	6.95	1.37	18.57	73
FSG 524	1.32	1.20	0.89	3.41	6.16	6.61	1.39	16.72	72
L-455 HD	1.29	1.20	0.82	3.31	6.14	6.78	1.49	16.89	78
Mariner IV	1.44	1.28	0.95	3.67	7.16	7.26	1.68	18.85	77
Persist III	1.41	1.15	0.89	3.45	7.21	6.96	1.55	18.31	75
Vernal	1.18	1.04	0.70	2.92	5.99	6.34	1.48	15.99	73
Mean	1.43	1.20	0.87	3.49	6.64	6.88	1.46	17.60	73
LSD P=.05	0.44	0.27	0.21	0.83	1.21	0.62	0.24	2.06	13
Prob(F)	0.51 ns	0.82 ns	0.56 ns	0.63 ns	0.06 ns	0.19 ns	0.03	0.04	0.64 ns
CV %	18.5	13.6	14.2	14.3	12.8	6.4	11.4	8.2	11

ns = no significant differences among varieties.

** NOTE: May harvest (cut 1) was not taken (clipped off) due to variability in the plots.

Establishment:	Seeded with a Hege 3-point hitch drill with presswheels at 16 lb/a.
Plot size:	4' x 20' , 15'alleys and borders, RCBD with four reps.
Soil type / analysis:	Crosby silt loam, pH=6.7, P=48 lbs/a, K= 200 lbs/a, CEC=17.7, O.M.=2.9, (11/16).
2017 Pest control:	Insecticide was applied on 28-April for weevil contriol, and 20-June, 18-July, 21-August for potato leafhopper control.
2017 Fertility:	500# of 0-0-60 and 200 #/A of 18-46-0 was applieed 11/2/16.

Table 4:

Alfalfa Variety Trial

Ohio, North Baltimore, Sown 8-27-2015

Variety	23-May	20-Jul	1-Sep	Total 2017**	Total 2016	% Stand
Released Cultivars:	---------- Tons Dry Matter/Acre ----------					9/25/2017
55Q27	2.80	3.08	1.94	7.82	5.56	83
55VR06	2.56	3.18	1.60	7.33	4.83	93
BlueJay HR	2.86	2.80	1.15	6.82	4.87	92
Caliber	2.86	2.99	1.66	7.51	4.42	95
Contender	2.70	2.95	1.62	7.27	4.76	90
Fierce	2.84	3.18	1.77	7.80	5.05	92
FSG 426	2.72	2.93	1.76	7.41	5.29	93
Mallard 5	2.84	3.38	2.02	8.23	4.80	95
Persist lll	3.13	3.17	2.19	8.49	5.57	80
Pluss lll	2.62	3.21	1.49	7.32	5.24	93
Red Falcon	2.91	2.95	2.02	7.88	4.38	83
Roadrunner	2.85	2.99	1.51	7.35	5.10	93
SW 5113	2.73	3.13	1.50	7.35	5.45	92
SW 5213	2.79	3.31	2.03	8.13	5.82	95
SW 5512 Y	2.84	3.21	1.86	7.90	5.31	93
SW 5909	2.72	2.09	1.68	6.49	4.60	93
Vernal	2.99	2.95	1.38	7.32	5.31	75
Mean	2.81	3.03	1.72	7.55	5.08	90
LSD P=.05	0.23	0.71	0.74	1.25	0.87	15
Prob(F)	0.01	0.24 ns	0.36 ns	0.23 ns	0.05	0.26 ns
CV %	4.9	14.2	25.8	10.0	12.1	10

** **Note** only three harvest were taken at North Baltimore in 2017 due to weather .

** Trial was fall seeded after spring planting failed **

ns = no significant differences among varieties.

Establishment:	Seeded with a Hege 3-point hitch drill with presswheels at 16 lb/a.
Plot size:	4' x 20' , 15'alleys and borders, RCBD with four reps.
Soil type / analysis:	Holtville silt loam, pH=6.5, P=88 lbs/a, K=286 lbs/a, CEC=17, O.M.=2.8, (11/16).
2017 Pest control:	Insecticide was applied on 30-May, 8-June, 8-August for potato leafhopper control.
2017 Fertility:	300 #/A of10-26-26 was applied on 10/31/16.

Table 5:

Alfalfa Variety Trial

Ohio, Wooster, Sown 4-25-2016

					Total		
Variety	24-May	26-Jun	31-Jul	6-Sep	2017	2016	2016-17
Released Cultivars:	---------- Tons Dry Matter/Acre ----------						
55Q27	3.06	1.66	1.97	1.16	7.85	1.98	9.82
55VR08	3.05	1.71	2.11	1.08	7.95	1.89	9.84
GA-497 HD	3.11	1.78	1.99	1.10	7.97	1.74	9.71
KF 406 A2	2.90	1.64	2.01	1.11	7.65	1.84	9.48
KF 425 HD	2.95	1.73	2.06	1.04	7.79	2.08	9.87
Lightning Bolt	3.15	1.71	2.11	1.12	8.07	1.76	9.83
Persist III	3.11	1.62	2.04	1.13	7.89	1.89	9.78
Pluss III	3.03	1.83	2.09	1.14	8.09	1.86	9.94
Rebound 6XT	3.06	1.67	2.02	1.06	7.81	1.81	9.62
Vernal	3.08	1.68	1.93	1.10	7.79	1.99	9.78
WL 365 HQ	3.16	1.80	2.10	1.22	8.26	1.94	10.20
Mean	3.06	1.71	2.04	1.11	7.92	1.89	9.81
LSD P=.05	0.41	0.20	0.19	0.13	0.59	0.30	0.75
Prob(F)	0.95 ns	0.42 ns	0.29 ns	0.26 ns	0.45 ns	0.61 ns	0.58 ns
CV %	9.4	8.3	6.8	8.4	5.2	11.3	5.4

* Variety tested using experimental seed that may not give performance identical to that of commercially available seed.

Establishment:	Seeded with a Hege 3-point hitch drill with presswheels at 16 lb/a.
Plot size:	4' x 20', 15' alleys and borders, RCBD with four reps.
Soil type / analysis:	Riddles silt loam, pH = 6.6, P = 90 lb/a, K = 200 lb/a, CEC = 7.2 (11/16).
2017 Fertility:	Applied 200 #/A of 0-46-0 and 500#/A of 0-0-60 on 7/3/2017
2017 Pest control:	Insecticide was applied 12- May for weevil control, 6-June, 18-July and 21-August for potato leafhopper control.

Table 6:

Alfalfa Variety Trial

Ohio, South Charleston, Sown 4-25-2017

Variety	8-Aug	6-Sep	Total 2017	% Stand 9/18/2017
Released Cultivars:	---------- Tons Dry Matter/Acre ----------			
54QR04	1.25	1.98	3.25	91
FSG 415 BR	1.33	2.03	3.33	84
Kingbird	0.93	1.40	2.33	83
Quail	1.38	1.70	3.10	85
Robin	1.00	1.78	2.75	86
WL356HQ.RR	1.20	1.75	2.95	86
Mean	1.21	1.77	2.97	85
LSD P=.05	0.49	0.33	0.56	15
Prob(F)	0.11 ns	0.06	0.02	0.86 ns
CV %	28.2	12.7	12.9	13

Note: Aftrer seeding in great soil conditions, the weather turned with three weeks of well below normal temperature and above average rainfall that affected stands.

ns = no significant differences among varieties.

Establishment:	Seeded with a Hege 3-point hitch drill with presswheels at 16 lb/a.
Plot size:	4' x 20' , 15'alleys and borders, RCBD with four reps.
Soil type / analysis:	Crosby silt loam, pH=7.0, P=110 lbs/a, K= 344 lbs/a, CEC=13, O.M.=1.4, (04/17).
2017 Pest control:	Insecticide was applied on 20-June, 1-July, 18-August for potato leafhopper control.

Orchardgrass

The orchardgrass trial seeded at South Charleston had an average yield of 5.11 tons/acre. Orchardgrass varieties can have significant maturity differences.

Table 7:
Orchargrass Variety Trial
Ohio, South Charleston, Sown 5-20-2014

						Total				
Variety	Marketers	23-May	26-Jun	17-Aug	13-Oct	2017	2016	2015	2014	2014-17
		---------- Tons Dry Matter/ Acre ----------								
Barlegro	Barenbrug USA	1.87	0.98	1.56	0.73	5.13	5.91	6.02	1.52	18.05
FSG 5060G*	Allied Seed	2.32	0.71	1.54	0.64	5.21	5.49	6.40	1.46	18.08
OG0604WH*	Allied Seed	2.42	0.74	1.32	0.72	5.19	5.25	6.22	1.43	17.57
Pennlate	Public	2.24	0.61	1.47	0.82	5.13	5.47	6.20	1.62	18.22
Potomac	Public	2.05	0.71	1.40	0.69	4.86	5.12	5.75	1.57	16.92
Profit	DLF International	2.19	0.70	1.35	0.80	5.04	5.46	6.29	1.62	17.59
SS-0708OGDT	Allied Seed	2.39	0.72	1.45	0.67	5.23	4.63	6.03	1.42	16.98
Mean		2.21	0.74	1.44	0.72	5.11	5.33	6.13	1.52	17.63
LSD P=.05		0.30	0.16	0.26	0.16	0.51	0.69	0.55	0.44	1.73
Prob(F)		0.01	0.01	0.42	0.24	0.74	0.04	0.30	0.90	0.54
CV %		9.0	14.8	12.3	14.5	6.7	8.7	6.1	16.2	5.5

* Variety tested using experimental seed that may not give performance identical to that of commercially available seed.

** Note ** Stand for all varieties is 100 %.

Establishment:	Seeded with a Hege 3-point hitch drill with presswheels at 20 lb/a.
Plot size:	4' x 15' , 15'alleys and borders, RCBD with four reps.
Soil type / analysis:	Kokomo silt loam, pH=6.7, P=48 lbs/a, K= 184 lbs/a, CEC=19.2, O.M.=2.9, (10/16).
2017 Fertility	Applied 100 lb/a of 46-0-0 on 23-March, 24-May, 27-June, 22-August.
	Applied 500 #/a of 0-0-60 and 200 #/a of 18-46-0 on 11/21/16.

Tall Fescue

The tall fescue trial established at South Charleston in 2014 had an average yield of 5.22 tons/acre. New varieties that are endophyte-free or that contain a non-toxic endophyte have potential to provide improved animal performance compared with the old endophyte-infected varieties, especially during the summer grazing season, and to provide forage for beef cattle and sheep during autumn and early winter.

In this trial we included KY 31 as a check variety, both endophyte-free (KY 31-) and endophyte-infected (KY 31+).

Table 8:
Tall Fescue Variety Trial
Ohio, South Charleston, Sown 5-20-2014

Variety	Marketers	23-May	26-Jun	17-Aug	13-Oct	Total 2017	2016	2015	2014	2014-17
		Tons Dry Matter/ Acre								
Barelite	Barenbrug USA	1.82	0.75	1.22	1.04	4.83	5.17	7.43	1.48	18.91
Brava	Allied Seed	1.96	0.70	1.43	1.09	5.19	6.23	7.80	2.10	21.32
Brutus	Saddle Butte Ag	1.99	0.75	1.48	1.15	5.36	5.07	7.97	1.63	20.03
KY 31 -	Public	1.94	0.72	1.44	0.88	4.97	5.39	7.98	1.86	20.20
KY 31+	Public	2.21	0.76	1.42	0.82	5.22	5.87	7.84	1.61	20.53
FSG 0402TF*	Allied Seed	2.11	1.06	1.51	1.07	5.76	5.55	7.59	1.94	20.84
TF 0705SL*	Allied Seed	2.05	0.78	1.53	0.88	5.24	5.67	7.55	2.21	20.67
Mean		2.01	0.79	1.43	0.99	5.22	5.56	7.74	1.83	20.35
LSD P=.05		0.45	0.37	0.18	0.20	0.69	0.72	0.77	0.48	1.74
Prob(F)		0.66 ns	0.49 ns	0.04	0.02	0.20 ns	0.04	0.66 ns	0.04	0.18 ns
CV %		15.2	31.8	8.4	13.7	8.9	8.7	6.7	17.7	5.8

* Variety tested using experimental seed that may not give performance identical to that of commercially available seed.
** Note ** Stand for all varieties is 100 %.

Establishment:	Seeded with a Hege 3-point hitch drill with presswheels at 20 lb/a.
Plot size:	4' x 15' , 15'alleys and borders, RCBD with four reps.
Soil type / analysis:	Kokomo silt loam, pH=6.7, P=48 lbs/a, K= 184 lbs/a, CEC=19.2, O.M.=2.9, (10/16).
2017 Fertility	Applied 100 lb/a of 46-0-0 on 23-March, 24-May, 27-June, 22-August.
	Applied 500 #/a of 0-0-60 and 200 #/a of 18-46-0 on 11/21/16.

Annual Ryegrass

An annual ryegrass trial was planted in September 2016. There was no winter injury. Forage yields in 2016-17 were near the long-term average at this location. Annual ryegrass is a cool-season annual bunchgrass that is highly palatable and digestible. It has high seedling vigor.

Table 9:
Annual Ryegrass Variety Trial
Ohio, South Charleston, Sown 9-16-2016

						Total							
		17-Nov	19-Apr	8-May	31-May	2016-17	5/8/2017	10/27/2016		11/17/2016		4/19/2017	
Variety	Marketers	----------Ton Dm/Acre ----------					Maturity	Stand	Cover	Stand	Cover	Stand	Cover
07-WW*	Oregon Seed	0.43	1.33	1.02	1.19	3.96	2	100	89	100	100	100	100
Bounty	Saddle Butte Ag	0.32	1.40	0.99	1.20	3.91	1	100	75	100	100	100	100
FLPE2X	Univ. of Floridia	0.21	1.48	0.64	1.07	3.40	2	100	75	100	100	100	100
FLPED4X	Univ. of Floridia	0.36	0.97	1.13	0.93	3.39	3	100	51	100	100	100	100
KO14-SPP*	Oregon Seed	0.33	1.14	1.28	1.05	3.79	2	100	68	100	100	100	100
KO14-WEAR*	Oregon Seed	0.13	1.30	0.92	1.21	3.56	2	100	70	100	100	100	100
KO14-WLS*	Oregon Seed	0.18	1.37	1.01	1.01	3.57	3	100	65	100	100	100	100
KO-14WMA*	Oregon Seed	0.12	1.29	1.27	1.11	3.79	1	100	70	100	100	100	100
Marshall	Wax Seed	0.15	1.43	1.02	1.17	3.77	2	100	55	100	100	100	100
NuSpirit	Oregon Seed	0.39	1.39	0.97	1.13	3.87	2	100	81	100	100	100	100
Ugne	Hood River Seed	0.24	0.90	1.78	1.45	4.36	1	100	69	100	100	100	100
Winterhawk	Oregon Seed	0.20	1.41	0.97	1.21	3.80	2	100	84	100	100	100	100
Mean		0.25	1.28	1.08	1.14	3.76	1.79	100	71	100	100	100	100
LSD P=.05		0.17	0.37	0.30	0.24	0.58	1	.	19.0	.	.	.	.
Prob(F)		0.01	0.05	0.0001	0.01	0.1	0.01	.	0.01	.	.	.	.
CV %		47	20	20	14	11	35	.	19	.	.	.	.

* Variety tested using experimental seed that may not give performance identical to that of commercially available seed.

Winter Injury -- There was no winter injury.
Maturity: 1 = vegitative, 2 = early boot, 3 = initial emergence from boot

Soil type / analysis: 2016 Crosby silt loam, pH=7.2, P=100 lbs/a, K=230lbs/a, CEC=10.5, O.M.=1.9,(10/16).

Fertilization: Appplied 100 lb/a of 46-0-0 on 4 - October.

2017 Fertilization: Applied 100 lb/a of 46-0-0 on 20-April.
Appplied 80 lb/a of 46-0-0 on 9-May.

Cover Crops

A cover crop variety trial was planted on September 16, 2016 at the South Charleston location to evaluate different cover crop species and varieties for stand and ground cover development throughout the fall and for stand, ground cover, and final biomass production the following spring.

The conditions for this trial are not meant to be representative of cover crop planting following soybeans or corn in Ohio, because it was planted in a well-prepared seedbed (conventionally tilled) in early September well before soybean or corn harvest timing in Ohio.

This trial more closely represents what would be possible with cover crops planted on land that was in winter wheat and laid fallow after the July grain harvest, although even in that situation no-till planting of the cover crops in September would be preferable for conservation purposes. Therefore, the results from this trial should be interpreted and applied with caution. The results do demonstrate the relative speed of fall ground cover establishment of different varieties planted in early September, and which ones survive the winter and grow in the spring (thus needing to be terminated before grain crop planting).

Table 10:
Cover Crop Trial - Seeded September 16, 2016 at South Charleston, OH

			9/30/2016		10/14/2016		10/27/2016		11/10/2016		4/4/2017		4/25/2017		11/10/2016	4/19/2017
Variety	Marketers	Type	stand	cover	stand	cover	stand	cover	stand	cover	stand	cover	stand	cover	Ton DM/A	Ton DM/A
BAYOU	Saddle Butte Ag	Kale	100	28	100	90	100	100	100	100	16	19	63	66	1.19	0.10
FLPE2X*	Univ. of Floridia	ARG	100	9	100	40	100	79	100	100	100	100	100	100	0.26	1.28
FLRED4X*	Univ. of Floridia	ARG	100	10	100	40	100	81	100	98	100	100	100	100	0.05	0.86
Impact	Allied Seed	Collard	100	33	100	89	100	100	100	100	81	100	100	89	0.58	0.78
LowBoy	Smith Seed	ARG	96	5	100	23	100	40	100	91	100	100	100	100	**	0.65
Marshall	Wax Seed	ARG	98	8	100	28	100	63	100	100	100	100	100	100	0.06	1.39
Master White	Allied Seed	Mustard	96	35	100	80	100	99	100	100	wk*	wk*	wk*	wk*	1.10	wk*
SARG-FL*	Smith Seed	ARG	53	5	59	20	66	43	100	91	94	90	99	99	**	0.84
SBER-1656	Smith Seed	Berseem clover	63	6	75	8	79	13	100	33	69	65	95	94	**	0.47
Shield	Saddle Butte Ag	Mustard	100	33	100	89	100	98	100	100	wk*	wk*	wk*	wk*	0.64	wk*
SRAD-1601*	Smith Seed	Radish	99	43	100	88	100	100	100	100	wk*	wk*	wk*	wk*	0.94	wk*
SRAD-1679*	Smith Seed	Radish	95	40	100	86	100	100	100	100	wk*	wk*	wk*	wk*	1.40	wk*
SRAD-1698*	Smith Seed	Radish	95	45	100	89	100	100	100	100	wk*	wk*	wk*	wk*	1.15	wk*
SRAD-1699*	Smith Seed	Radish	96	38	100	86	100	100	100	100	wk*	wk*	wk*	wk*	0.70	wk*
Villana	Smith Seed	Hairy Vetch	100	8	100	30	100	63	100	100	100	100	100	100	0.14	1.09
Villata	Smith Seed	Hairy Vetch	73	9	55	18	63	40	100	91	88	78	98	100	**	0.63
Mean			91	22	93	56	94	76	100	94	53	53	60	59	1	1
LSD P=.05			16.28	6.84	9.55	6.84	7.76	8.21	--	3.83	9.41	11.63	8.78	9.8	0.80	0.37
Prob(F)			0.04	0.04	0.04	0.04	0.04	0.04	--	0.04	0.04	0.04	0.04	0.04	0.03	0.0001
CV %			13	23	7	9	6	8	--	3	8	9	6	7	53	33

* Experimental varieties that may be named at a later date

wk* - winter killed speices

** Insufficient growth to collect with plot harvester.

Soil type / analysis: Crosby silt loam, pH=7.2, P= 100 lbs/a, K= 230 lbs/a, CEC=10.5, O.M.=1.9,(10/16).

ADDRESS OF MARKETERS

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