EDIBLE BEAN

AGRONOMY
AND
PEST MANAGEMENT
RESEARCH RESULTS

2018

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RIDGETOWN CAMPUS

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Agronomy and Pest Management Research Results for Dry Edible Beans 2018

This report is a compilation of agronomy and pest management research results in dry edible beans at Ridgetown College and the Huron Research Station. It has been produced as a reference for growers and industry personnel.

A number of the pesticides that are included in this report are not currently registered for use in dry edible beans in Ontario. Always follow label directions when applying pesticides.

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2018 Heat Unit and Precipitation Summary for Exeter and Ridgetown.

Ontario Corn Heat Units (OCHU)				
	Huron Research (Exeter)		Ridgetown Campus	
Month	2018	Norm (37 yr)	2018	Norm (42 yr)
May	594	365	509	379
June	694	659	645	683
July	808	777	756	794
August	844	750	819	766
September	641	561	648	675
October	41	47	221	217
Total	3622	3167	3598	3418

Precipitation (mm)

	Huron Research (Exeter)		Ridgetown Campus	
Month	2018	Norm (37 yr)	2018	Norm (42 yr)
May	65	84	106	82
June	85	81	43	69
July	71	81	91	82
August	147	70	100	86
September	67	105	102	87
October	94	94	124	65
Total	572	516	566	472

20% or more below average

20% or more above average

2018 Weather

Heat unit accumulation was above average in 2018. April was extremely cold and wet, and very little field activity was seen. Soils dried out slowly in May,but above average CHU accumulation dried soil quickly. There were blocks of June, July and August that were dry and warm, which created stress on the dry bean crop. Night time temperatures were particularly warm in July and August. A killing frost was observed in Ridgetown on October 18. Heat unit accumulation halted at the Huron Research Station on October 18, following 3 nights below 4 ^{o}C. Unseasonably cool temperatures and regular rain events from mid-September onwards delayed crop maturity and made harvest difficult through October, November and December. Farmers west of Toronto had not faced such a wet and miserable harvest in recent memory. A number of later maturing commercial dry bean fields were not harvested, due to wet soil conditions, deteriorating plants and poor bean seed quality.

EXECUTIVE SUMMARY

Variety Registration and Performance Trials (ongoing)

Seeding was on schedule at the Huron Research Station (May 29), Auburn (June 1) and Exeter (June 7). Four studies were seeded in 2018 (see table below). The Auburn site had some poor emergence due to dry conditions after seeding, and a severe outbreak of late emerging perennial weeds (field bindweed). This was coupled with extremely poor harvest weather conditions which led to the abandonment of the site. The Exeter navy and small seed trial were at the home farm of C. Hicks. Conditions at the site were ideal for bean production. The large seeded trial was relocated to the Huron Research Station. Very dry weather during early pod fill resulted in variability in seed set and low yield, particularly among early maturing cultivars.

Summary of Registration/Performance Trials, Huron Research Station, 2018

Location	Market Class	Average Yield	C.V.	Notes
Auburn	Navy	--	--	Nor harvested due to damage
Exeter	Navy	3856	7.0	Above average yield
Exeter	Cran/Kidney	3750	8.6	Above average yield
Exeter	Small seed	1131	18.6	Poor yield, very dry in August

Preliminary Yield Trials (ongoing)

Four studies were seeded in 2018 at Auburn, Exeter and Woodstock (see table below). In addition, a preliminary site was seeded at Emo in northern Ontario. See above for comments on the conditions at each site. Conditions at the Emo site were very wet after planting which gave poor emergence and then very dry for most of the summer which resulted in early maturity and variable yield. Only two replicates were harvested at the Emo site (data not shown).

Summary of Preliminary Yield Trials, Huron Research Station, 2018

Location	Market Class	Average Yield	C.V.	Notes
Auburn	Navy/Black/Misc	--	--	Not harvested due to damage
Exeter	Navy/Black/Misc	3877	11.6	Above average yield
Exeter	Cran/Kidney/Misc	1749	16.2	Poor yield, very dry in August
Woodstock	Cran/Kidney/Misc	4311	14.4	Excellent yield
Total Entries				56 distinct entries at 4 sites

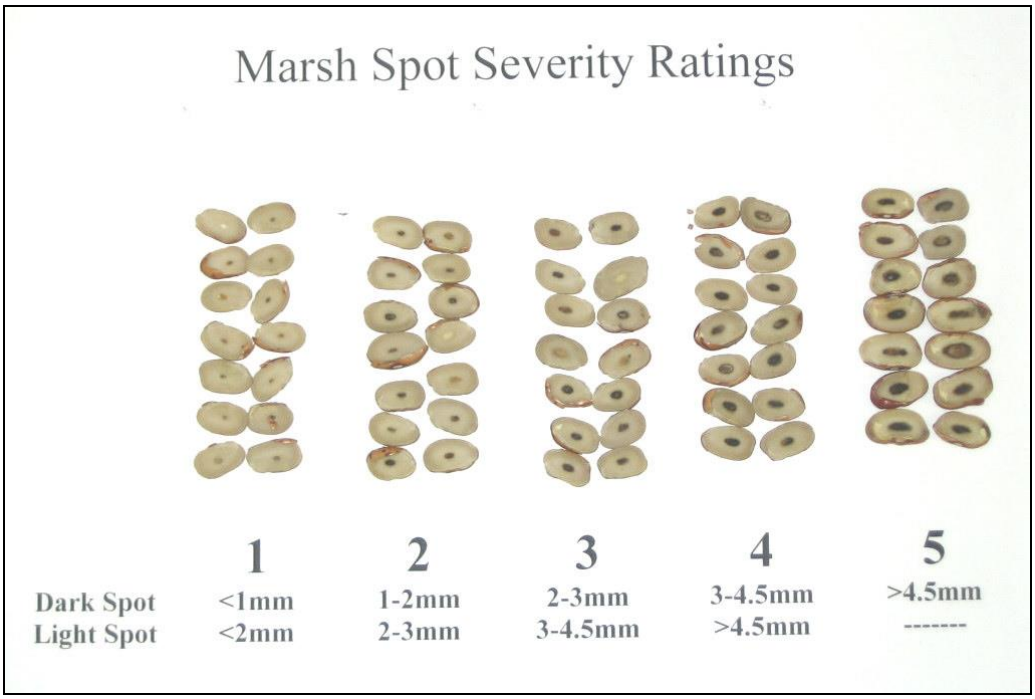
A number of public and private breeding programs took part in the trials, including ADM, Agr. Canada/U of G, AmeriSeed (Co-op), HDC, Thompsons, MSU, Trinity Genetics, Treasure

Valley and Seminis. The primary site was at Exeter, and these trials were repeated at Auburn (narrow row) and Woodstock (wide row).
There were 50 entries tested as follows: navy (13 entries), DRK (6 entries), LRK (4 entries), WK (2 entries), Cran (8 entries), Black (6 entries), Otebo (1), Pinto (1), Small Red (3) and food-type soybean (1).
Black – Top yielding lines include Zenith, ACUG 15-B4 and B16504.
Navy – Top yielding lines include HMS Medalist, NA15095 and NA15904.
La Paz (pinto), T9905 (navy), Yeti (WK) and Inferno (LRK) did well at Exeter and Woodstock.

Evaluation of Marsh Spot in Dry Beans (Ongoing)

Marsh spot is a physiological disorder found primarily in cranberry beans (occasionally in kidney beans). Cells in the center of the cotyledons die and turn a gray/black colour (see Fig. 1). The damage is evident once the seed is split along the cotyledonary axis, and opened up to view the interior of the cotyledons. It can create serious marketing issues for bean dealers. Marsh spot incidence was above average in 2018 particularly at Woodstock.
Registration/Performance Trials - Cranberry cultivars from trials at Exeter, Elora and St. Thomas locations were evaluated for marsh spot and compared to Etna (resistant check) and Messina (susceptible check). All of the lines tested were similar to the resistant check Etna. ACUG 17-C3 and ACUG 14-C2 had marsh spot scores that were at the upper end of the cultivars tested. These two lines had relatively low scores in 2017.
Preliminary Yield Trials – Cranberry cultivars from the trial at Exeter and Woodstock were evaluated. The incidence of marsh spot at Woodstock was above average in 2018. The cultivars AAC Scotty and 16760 were higher than Etna (resistant check), while cultivar 16754 was similar to Messina (susceptible check) at the Woodstock site.

Figure 1: Marsh Spot Severity Ratings



Anthracnose Foliar Fungicide in Dry Beans (ongoing)

This is an ongoing study to develop a long term data set on fungicide efficacy for anthracnose control and calculate the economic returns of fungicide use. A spore suspension was used as an inoculum source on disease free plants, and irrigation was used to promote disease development. Two studies were seeded about 4 weeks apart, and were inoculated at first flower. Disease pressure following inoculation was average in the first study, and above average in the second study. Quadris and Headline, the two standard treatments, both provided excellent disease control and yield, but Headline was superior in the second study. Allegro and Acapela were similar to Quadris for disease control and yield. Senator, Circobin and Propulse had higher disease than Quadris, while Propulse had lower yield than Quadris. Fluopyram, Vertisan, Quash and Fludioxonil had unacceptable disease control, which impacted yield as well. Cotegra was a new treatment with high disease severity and low yield, which was expected based on past performance of its components (prothioconazole + boscalid). Priaxor (pyraclostrobin + fluxapyroxad) contains the same a.i. as Headline, and performed similarly to Headline in both studies. The performance of the second new treatment Delaro (prothioconazole + trifloxystrobin) was exceptional, and similar to Headline for both disease and yield.

Anthracnose Fungicide x Foliar Fertilizer in Dry Beans (Year 2 of 3)

This study investigated various tank mixes of foliar fertilizers + anthracnose fungicides to determine if the fertilizers antagonized the fungicides disease efficacy. The experiment was organized as a factorial design with five fungicide (Control, Headline, Quadris, Allegro and Propulse) and four foliar fertilizer (Control, Crop Booster, Releaf Mn and Phi 42K) treatments. A spore suspension was used as an inoculum source on disease free plants, and irrigation was used to promote disease development. Fungicide and fertilizer treatments were applied within 24 hours of disease inoculation. Two studies were seeded about 4 weeks apart, and were inoculated at first flower. Disease pressure following inoculation was average in the first study, and above average in the second study. Headline consistently provided the lowest disease severity and the highest yield in both studies. Quadris had higher disease severity, compared to Headline, and had lower yield. Allegro was often similar to Quadris for disease severity, and had similar yield at harvest. Propulse had the highest disease severity, which was evident early on in the disease ratings. Propulse also had lower yield in the 2nd study. Phi 42K reduced disease severity for each fungicide treatment, compared to the fungicide applied without a foliar fertilizer. This was particularly evident with Propulse, which was the weakest fungicide for anthracnose control. The disease suppression provided by Phi 42K resulted in a yield increase across the fungicide treatments in the 2nd study. The basis for this response is unknown, but these results agree with another study conducted in 2017. Future work will determine if the response is a suppression of disease development by the fertilizer or a synergistic effect between the fertilizer and various fungicides.

Anthracnose Seed Treatment in Dry Beans (Year 1)

The management of seed borne anthracnose by seed treatments has not been studied for several years. This research was restarted in 2018, as several new seed treatment compounds were recently registered for dry bean in Canada. Seed harvested from previous anthracnose studies were used for all treatments except the non-inoculated control, which used Idaho grown seed of the same cultivar. Two studies were planted about four weeks apart, to provide different environmental conditions for disease development. All treatments received Cruiser insecticide to manage soil insect populations. The first study had moderate disease development in pod tissue only, while the second study had moderately high disease development in stem and pod tissue.

Treatments containing Dynasty tended to have lower plant emergence and vigour, but this effect has been observed in several seed treatment studies in the past. The standard treatment of Cruiser Maxx Bean had less disease than the Inoculated Control. Cruiser Maxx Bean + Dynasty occasionally reduced disease severity, compared to Cruiser Maxx Bean applied alone, but the response was frequently similar. The addition of Sedaxane to these treatments had no additive effect on disease management. Rancona Summit was similar to Cruiser Maxx Bean for disease severity. The addition of Maxim to Rancona Summit did not have an effect on disease development. The addition of Rancona Summit to Cruiser Maxx Bean or Cruiser Maxx Bean + Dynasty did not reduce disease severity, compared to Cruiser Maxx Bean alone. Evergol Energy and Insure Pulse reduced disease development, compared to the Inoculated Control. Evergol Energy gave a yield increase compared to the Inoculated Control, while Insure Pulse did not.

White Mold Foliar Fungicide in Dry Beans (ongoing)

This is an ongoing study to develop a long term data set on white mold fungicide efficacy and economic returns. Two trials were planted in 2018. Disease pressure was average in the 1st study, and moderately high in the 2nd study, but the disease developed quite late in both trials. In the first study, the fungicide treatments provided a similar reduction in disease severity, compared to the untreated control. Two applications of Propulse at the high label rate had the highest yield, but it was similar to several treatments. Delaro is a new treatment that had disappointingly low yield. Fludioxonil had low yield that was similar to the untreated control. In the second study, all of the fungicide treatments had less disease than the untreated control, but there were few consistent differences between treatments. Treatments were very inconsistent for yield, with several instances where a product's low rate outperforming the high rate (trt 12 vs 13) and a single application of a compound outperforming a sequential application (trt 5 vs 4). This coupled with the fact that disease development occurred quite late in the growing season suggests that this caution should be used to interpret product performance from this data set.

White Mold Foliar Fungicide in Soybean (ongoing)

This is an ongoing study to develop a long term data set on white mold fungicide efficacy in soybeans. This study has been conducted for 6 years, but good treatment separation has been achieved for only in 2016 and 2017. Disease pressure in 2017 was very high in both studies. Two trials were planted in 2018. Disease pressure was very low in the 1st study, and below average in the 2nd study. White mold developed very late in the season, long after the fungicides were applied. In the first study, Stratego Pro, as well as a combination of Priaxor and Cotegra, had less disease than the untreated control. However, the disease infection was very low in this study, and there were no treatment differences at harvest. In the 2nd study, the fungicides were similar to the untreated control for disease severity at 59 days after the first fungicide application. By 78 days after application, all of the fungicides had less disease severity than the untreated control, but the overall disease severity was low. The fungicides did not provide a yield increase, versus the untreated control.

Sulphur Fertilizer in Dry Bean and Soybean (Year 1 of 3)

The primary goal of the study was to determine the response of dry bean cultivars to three sulphur fertilizers applied at planting. Sufficient product was applied to provide 25 kg/ha of S. Since some fertilizers contain nitrogen, each treatment was balanced with a nitrogen fertilizer to 50 kg/ha of N, which is a typical rate of nitrogen applied by commercial dry bean growers.

For dry beans, there were no difference between treatments for tissue S analysis at 44 (V5) and 70 (R2) days after planting (DAP). At 70 DAP, dry bean leaf tissue was well below the generally accepted minimum level of 0.25%. Treatments were similar for plant height, plant

development (BBCH) and average plant dry weight at 44 DAP. Cultivars differed for Greenseeker score at 44 DAP, seed weight and yield. However, the S fertilizer treatments did not provide a yield response in navy or black bean cultivars.

For soybeans, there were few differences between S fertilizer treatments for tissue analysis, plant growth and development, seed weight or yield. As expected, there were cultivar differences for plant growth and development and seed weight.

Root Rot Seed Treatment (ongoing)

This is an ongoing study to seed treatment combinations on early season plant emergence and vigour, and yield at harvest. The treatment list was revamped in 2018 to start with two base compounds: Cruiser Maxx Bean and Rancona Summit, with Dynasty and Sedaxane layered on top, either alone and in combination, to measure the additive effect of each compound. Two other recently registered seed treatment products (Evergol Energy and Insure Pulse) were compared to these treatment combinations. All plots received Cruiser to minimize any confounding effects from soil insects. Two studies were conducted for each root rot species using two different rates of inoculant.

Fusarium - disease pressure was moderate, with treatment differences evident for emergence and plant vigour for the first 35 days after planting (DAP). Treatment differences for yield were measured in the high inoculation study only. The addition of Dynasty to Cruiser Maxx Bean initially decreased plant emergence and vigour, but ultimately gave the highest plant emergence and vigour, along with the highest seed yield. The addition of Sedaxane did not improve any treatment combination. Adding Rancona Summit to Cruiser Maxx Bean did not improve plant emergence, plant vigour or yield. Evergol Energy had low plant emergence and plant vigour, as well as low yield. Insure Pulse had high emergence and vigour scores, and a moderate increase in yield.

Rhizoctonia - disease pressure was moderate, with treatment differences evident for emergence and plant vigour for the first 35 days after planting (DAP). There were no treatment differences for yield in either study. The addition of Dynasty to Cruiser Maxx Bean tended to decrease early plant emergence and vigour scores. Sedaxane decreased plant emergence and plant vigour when it was combined with Cruiser Maxx Bean, but Sedaxane increased plant emergence and vigour when it was combined with Rancona Summit in the first study. In the second study, Rancona Summit + Maxim + Sedaxane was the top treatment. Evergol Energy had high plant emergence and plant vigour scores, while Insure Pulse had average emergence and vigour scores.

Soybean Cultivar Performance (ongoing)

A summary of the Ontario Soybean and Canola Committee (OSACC) 2800 CHU soybean cultivar performance trials conducted near Exeter ON in 2018 is provided. There are separate studies for Roundup ready cultivars and conventional (food-type) cultivars. The conventional study had low variability and high yields. The Roundup ready study was slightly more variable, and yields were very high (69.4 bu/ac).

2018 Navy Bean Registration and Performance - Exeter

No.	Name	Yield Rank	Yield (kg/ha)	Yield Index	Yield to Maturity	Days to Maturity	Seed Weight (g/100)	Lodging (1-5; 1=low)	Harvestability (1-5; 1=good)	Seed Quality (1-5; good)
1	OAC Thunder	21	3714	96	33	112.3	24.5	2.1	2.1	3.0
2	T9905	22	3686	96	33	112.3	25.1	2.3	1.9	3.0
3	Lightning	27	3520	91	32	111.5	22.8	2.1	1.8	2.8
4	Nautica	26	3530	92	31	112.8	22.1	2.1	2.0	2.4
5	Rexeter	13	3906	101	35	112.8	21.9	2.0	1.8	2.8
6	Fathom	3	4278	111	38	112.5	24.8	2.0	1.9	2.3
7	Apex	7	4065	105	36	113.0	25.2	1.8	1.5	2.0
8	Lighthouse	8	4049	105	36	113.0	23.0	1.5	1.0	2.1
9	Bolt	25	3559	92	32	111.8	27.0	1.9	1.4	2.3
10	Mist	6	4101	106	36	113.5	23.3	1.6	1.4	2.0
11	DS105W0	17	3835	99	34	112.5	23.8	3.0	2.9	2.8
12	Blizzard	15	3846	100	34	113.8	23.0	2.4	2.1	1.9
13	Indi	4	4229	110	38	110.5	21.1	1.1	1.0	1.9
14	AAC Argosy	9	4041	105	35	114.5	24.9	2.1	2.1	2.1
15	AAC Shock	14	3885	101	35	112.0	25.1	2.0	1.6	2.3
16	ACUG 16-3	24	3649	95	33	111.5	19.9	1.8	1.6	2.6
17	ACUG 16-5	28	3454	90	30	113.8	22.5	2.4	2.3	3.0
18	ACUG 16-6	18	3808	99	34	113.0	21.2	2.8	2.4	2.6
19	ACUG 17-2	29	3453	90	31	112.5	21.7	2.0	1.6	2.1
20	ACUG 17-3	30	3345	87	30	111.3	21.8	2.3	2.3	2.0
21	ACUG 17-5	20	3739	97	33	113.5	23.4	2.8	2.3	1.9
22	NA 12063	2	4323	112	38	112.5	24.7	2.0	1.6	2.1
23	NA 13068	1	4337	112	39	111.0	24.2	2.0	1.6	1.8
24	ACUG 18-1	19	3771	98	34	112.5	22.0	2.1	2.0	2.4
25	ACUG 18-2	12	3924	102	35	111.5	23.7	1.9	1.9	2.5
26	ACUG 18-3	23	3651	95	32	112.5	23.8	2.0	1.9	2.1
27	ACUG 18-4	5	4165	108	37	113.3	26.9	1.5	1.3	2.0
28	ACUG 18-5	10	3984	103	35	112.8	25.2	2.0	1.9	2.3
29	ACUG 18-6	16	3841	100	34	113.8	24.4	2.8	2.4	1.6
30	ACUG 18-7	11	3976	103	34	115.5	23.5	2.5	2.4	2.1
Mean			3855	100	34	112.7	23.6	2.1	1.9	2.3
CV			7.0			0.8	2.7	15.7	17.7	10.5
LSD			384			1.2	0.9	0.5	0.5	0.3

Trial Summary

Design: RCBD
Row Width: Narrow = 15 inch (38 cm)
Number of Rows Per Plot: 6
Number of Rows Harvested Per Plot: 4
Plot Length: 6 m
Harvest Length: 5 m
Seeding Rate: 17 seeds/m
Seed Treatment: CruiserMaxxBean + Dynasty

Fertilizer: 0-0-100 lbs applied and ploughed in fall
15 gallons/ac 28% ppi (June 6)
Herbicide: Pursuit .2 L/ha, Frontier .75 L/ha, Prowl (1l/ha) ppi (June 6)
Fungicide/Insecticide:
Matador (83ml/ha), Headline (0.4 l/ha),Allegro (0.6 l/ha) (July 19)
Matador (83mL/ha), Propulse (750mL/ha), (July 31)
Matador (50mL/ha), Quadris (0.5L/ha), Allegro (1L/ha) (Aug 15)
Dessication: Eragon (146g/ha), Merge (1l/ha) (September 23)
Planting Date: June 7
Harvest Date: October 14

2018 Small Seeded Bean Registration and Performance - Exeter

No.	Name	Yield Rank	Yield (kg/ha)	Yield Index	Yield to Maturity	Days to Maturity	Seed Weight (g/100)	Lodging (1-5; 1=low)	Harvestability (1-5; 1=good)	Seed Quality (1-5; good)
1	Zenith	9	3882	104	34	114.5	25.4	2.0	1.6	1.4
2	Zorro	8	3933	105	35	112.0	25.1	2.5	2.1	2.0
3	Viper	4	4089	109	36	112.5	32.9	2.5	2.3	2.1
4	OAC Rosito	6	3987	106	35	112.5	26.0	1.5	1.3	1.8
5	ACUG 15-B4	5	4048	108	36	113.5	25.1	2.5	2.1	1.8
6	La Paz	18	3338	89	30	112.8	39.3	3.1	2.8	2.0
7	Merlot	19	3307	88	30	111.5	41.6	2.9	2.8	2.0
8	Caldera (11511)	7	3987	106	35	113.0	45.5	2.6	2.3	1.9
9	14506	2	4362	116	39	111.8	26.3	2.0	1.8	1.9
10	14497	1	4547	121	40	113.0	25.7	1.9	1.6	2.0
11	ACUG 17-B2	10	3765	100	34	111.8	23.5	2.4	2.4	2.0
12	ACUG 17-B4	16	3413	91	30	113.0	27.1	2.1	2.0	1.6
13	ACUG 16-NDP1	17	3403	91	30	112.0	39.3	2.1	1.6	1.5
14	ACUG 18-B1	15	3419	91	31	111.0	25.2	2.6	2.5	1.8
15	ACUG 18-B3	20	2825	75	25	112.0	23.9	3.0	2.8	2.3
16	ACUG 17-B3	11	3723	99	33	112.8	24.0	3.4	3.1	2.0
17	ACUG 17-B5	13	3608	96	32	113.0	23.7	2.5	2.1	2.0
18	ACUG 18-B2	12	3637	97	33	111.5	24.6	2.4	2.1	2.5
19	ACUG 18-B4	14	3584	96	32	112.0	31.5	2.3	2.1	1.5
20	ACUG 18-B5	3	4144	111	37	113.3	26.7	2.3	1.9	2.0
Mean			3750	100.0	33.3	112.5	29.1	2.4	2.2	1.9
LSD (P=.05)			456			1.3	1.2	0.5	0.5	0.3
CV			8.6			0.8	2.9	13.5	15.2	9.7

Trial Summary

Design: RCBD
Row Width: Narrow = 15 inch (38 cm)
Number of Rows Per Plot: 6
Number of Rows Harvested Per Plot: 4
Plot Length: 6 m
Harvest Length: 5 m
Seeding Rate: 17 seeds/m
Seed Treatment: CruiserMaxxBean + Dynasty

Fertilizer: 0-0-100 lbs applied and ploughed in fall
15 gallons/ac 28% ppi (June 6)
Herbicide: Pursuit 0.2 L/ha, Frontier .75 L/ha, Prowl (1l/ha) ppi (June 6)
Fungicide/Insecticide:
Matador (83ml/ha), Headline (400ml/ha),Allegro (600ml/ha) (July 19)
Matador (83mL/ha), Propulse (750mL/ha), (July 31)
Matador (50mL/ha), Quadris (500mL/ha), Allegro (1L/ha) (August 15)
Dessication: Eragon (146g/ha), Merge (1l/ha) (September 23)
Planting Date: June 7
Harvest Date: October 14

2018 Cran and Kidney Bean Registration and Performance - Exeter

No.	Name	Market Class	Yield Rank	Yield (kg/ha)	Yield Index	Yield / Maturity	Seed Weight (g/100)	Days to Maturity	Seed Quality (1-5)
1	Dynasty	DRK	2	1555	54	15	66.1	107	1.6
2	OAC Inferno	LRK	1	1660	57	15	63.0	108	1.6
3	Yeti	WK	9	1228	42	11	52.4	108	1.8
4	14-C2	Cran	6	1299	45	12	66.3	107	2.1
5	15-C2	Cran	8	1289	45	12	61.5	107	2.1
6	ACUG 16-D2	DRK	22	797	28	8	50.7	100	2.0
7	ACUG 15-L1	LRK	7	1293	45	13	56.5	102	1.8
8	Etna	Cran	19	900	31	9	60.9	102	2.8
9	Red Hawk	DRK	16	1006	35	10	50.1	96	2.5
10	Pink Panther	LRK	14	1090	38	11	59.4	97	2.6
11	Red Rider	Cran	15	1083	37	10	60.1	108	2.8
12	Big Red	LRK	18	920	32	10	52.5	95	2.4
13	SV3709GC	Cran	17	936	32	10	61.1	95	2.1
14	McEarly	CRAN	23	763	26	7	66.8	107	2.5
15	ACUG 17-L1	LRK	10	1213	42	12	55.8	98	1.9
16	ACUG18-L1	LRK	12	1146	40	12	48.3	99	2.0
17	ACUG18-L2	LRK	20	863	30	9	50.3	96	2.3
18	ACUG18-W1	WK	4	1435	50	13	51.6	108	2.0
19	ACUG 17-C1	Cran	24	757	26	7	61.5	103	2.0
20	ACUG 17-C3	Cran	11	1148	40	11	60.8	107	2.6
21	ACUG 17-D2	DRK	5	1345	46	13	67.3	105	1.6
22	ACUG 17-W1	WK	3	1527	53	15	63.9	100	2.1
23	ACUG18-NDC1	WK	21	801	28	8	61.1	100	3.3
24	Vero	Cran	13	1093	38	11	62.2	104	2.4
	Mean			1131	39	11	58.8	102.5	2.2
	C.V.			18.6			6.1	2.5	16.6
	LSD P=0.05			298			5.1	3.6	0.5

Trial Summary

Design: RCBD
Row Width: Wide = 30 inch (76 cm)
Number of Rows Per Plot: 2
Number of Rows Harvested Per Plot: 2
Plot Length: 6 m
Harvest Length: 4m.
Seeding Rate: 17 seeds/m
Seed Treatment: CruiserMaxx + Dynasty

Fertilizer: 30 N, 30 Slow Release N from ESN, 40 P, 50 K, 3 Zinc lbs/ac (May 23)
Herbicide: Pursuit 170 ml/ha, Bonanza 1.5 L/ha ppi (May 28)
Planting Date: May 29
Fungicide/Insecticide:Matador (100mL/ha) (July 4)
Matador (100mL/ha), Headline (400mL/ha), Allegro (1.0L/ha) (July 19)
Matador (100mL/ha), Lance (770 g/ha), (July 27)
Matador (100mL/ha) (August 13)
Dessication: Eragon (140 ml/ha), Merge (1L/ha) (September 11)
Harvest Dates: September 8, 17

2018 Narrow Row Dry Bean Preliminary Yield Trial (PYT) - Huron Research Station

No.	Name	Market Class	Sponsor	Yield Rank	Yield (kg/ha)	Yield Index	Seed Weight (g/100)	Days to Maturity	Lodging (1-5; 1=low)	Harvestability (1-5; 1=good)	Seed Quality (1-5; 1=good)
1	HMS Medalist	White	AmeriSeed	3	4248	110	21.2	113.3	2.4	2.0	2.5
2	Rexeter	White	HDC	9	3994	103	22.1	112.8	2.5	2.1	2.3
3	T9905	White	WG Thompson	8	4002	103	25.9	113.8	3.0	2.5	3.0
4	Mist	White	HDC	15	3871	100	23.5	113.8	2.0	1.8	2.0
5	Lighthouse	White	ACUG	14	3889	100	23.7	114.0	1.9	1.8	1.8
6	Bolt	White	HDC	22	3418	88	26.9	112.0	2.4	2.1	2.3
7	AAC Shock	White	HDC	17	3769	97	25.1	113.0	2.6	2.0	2.4
8	AAC Argosy	White	ACUG	19	3756	97	24.5	114.3	2.1	1.8	2.1
9	N14229	White	MSU	23	3229	83	20.0	112.0	2.4	1.9	2.1
10	NA14068	White	AmeriSeed	7	4053	105	24.7	113.5	2.4	1.8	2.6
11	NA14084	White	AmeriSeed	12	3938	102	23.4	112.8	2.1	1.8	1.9
12	NA15095	White	AmeriSeed	2	4293	111	22.3	114.0	2.4	2.0	2.3
13	NA15094	White	AmeriSeed	1	4349	112	24.9	112.3	2.6	1.9	2.0
14	Zorro	Black	MSU	10	3967	102	24.6	113.8	2.9	2.1	1.9
15	Zenith	Black	MSU	5	4184	108	25.7	113.8	2.3	1.6	1.8
16	B16504	Black	MSU	4	4199	108	24.8	112.5	2.1	1.8	2.0
17	BL14504	Black	Coop Elevator	13	3924	101	28.9	112.5	2.3	1.8	2.0
18	BL14500	Black	Coop Elevator	11	3961	102	27.0	114.3	1.9	1.5	1.9
19	ACUG15-B4	Black	ACUG	6	4108	106	23.8	114.3	2.4	1.9	2.0
20	S03-W4	Soybean	Syngenta	24	2963	76	19.6	105.3	1.0	1.0	2.0
21	Viper	SR	ADM	21	3635	94	33.9	113.3	2.9	2.3	2.0
22	Cayenne	SR	MSU	16	3798	98	39.3	112.3	3.3	2.6	2.0
23	OAC Rosito	SR	ACUG	18	3766	97	25.4	113.8	1.8	1.6	1.8
24	La Paz	Pinto	AmeriSeed	20	3737	96	40.5	111.8	3.4	2.9	2.0
Mean					3877	100	25.9	112.9	2.4	1.9	2.1
LSD (P=.05)					634.4		1.0	1.1	0.5	0.5	0.3
CV					11.6		2.8	0.7	14.9	17.4	11.0
Treatment Prob(F)					0.0105		0.0001	0.0001	0.0001	0.0001	0.0001

Trial Summary

Design: RCBD
Row Width: Narrow = 15 inch (38 cm)
Number of Rows Per Plot: 6
Number of Rows Harvested Per Plot: 4
Plot Length: 6 m
Harvest Length: 5 m
Seeding Rate: 17 seeds/m
Seed Treatment: CruiserMaxxBean + Dynasty

Fertilizer: 0-0-100 lbs applied and ploughed in fall
15 gallons/ac 28% ppi (June 6)
Herbicide: Pursuit .2 L/ha, Frontier .75 L/ha, Prowl (1l/ha) ppi (June 6)
Fungicide/Insecticide:
Matador (83ml/ha), Headline (400ml/ha),Allegro (600ml/ha) (July 19)
Matador (83mL/ha), Propulse (750mL/ha), (July 31)
Matador (50mL/ha), Quadris (500mL/ha), Allegro (1L/ha) (August 15)
Dessication: Eragon (146g/ha), Merge (1l/ha) (September 23)
Planting Date: June 7
Harvest Date: October 16

2018 Cran and Kidney Bean Preliminary Yield Trial - Exeter

No.	Name	Market Class	Sponsor	Yield Rank	Yield (kg/ha)	Yield Index	Yield / Maturity	Seed Weight (g/100)	Days to Maturity	Seed Quality (1-5)
1	Inferno	LRK	SECAN	2	2413	138	22	61.9	108	1.9
2	Clouseau	LRK	Seminis	21	1519	87	16	62.0	95	2.3
3	Pink Panther	LRK	Seminis	20	1521	87	15	56.9	100	2.3
4	K15601	LRK	MSU	25	1299	74	13	38.7	97	2.8
5	Dynasty	DRK	HDC	3	2362	135	22	66.5	106	1.8
6	Red Rover	DRK	Seminis	12	1718	98	17	58.0	100	2.0
7	Red Cedar (K11306)	DRK	MSU	24	1301	74	13	45.3	100	2.3
8	Epic (09430)	DRK	Trinity Genetics	6	1999	114	20	60.8	99	1.5
9	Rampart (09434)	DRK	Trinity Genetics	18	1557	89	16	48.8	96	2.0
10	9431	DRK	Trinity Genetics	11	1723	99	16	51.1	105	2.1
11	Etna	CRAN	Seminis	26	1226	70	12	62.1	104	3.0
12	AAC Scotty (CR318-6)	CRAN	ACUG	9	1832	105	17	59.6	106	2.4
13	Chianti	CRAN	Seminis	13	1711	98	16	66.1	106	2.4
14	151085	CRAN	Trinity Genetics	15	1673	96	16	65.4	102	2.6
15	151093	CRAN	Trinity Genetics	7	1890	108	18	56.3	107	2.4
16	16764	CRAN	Trinity Genetics	14	1679	96	17	58.4	101	2.5
17	16760	CRAN	Trinity Genetics	19	1533	88	16	60.3	95	2.4
18	Red Rider	CRAN	Trinity Genetics	10	1803	103	17	58.6	107	3.0
19	La Paz	Pinto	ProVita	1	2773	159	28	41.5	100	1.8
20	Hime	Otebo	HDC	17	1558	89	15	26.5	105	2.6
21	T9905	Navy	Treasure Valley	4	2109	121	21	21.3	102	2.0
22	Viper	SRM	ADM	16	1593	91	16	29.1	97	2.8
23	Zorro	Black	MSU	22	1492	85	16	20.3	96	1.9
24	Yeti	WK	HDC	5	2022	116	19	54.1	107	1.8
25	K15901	WK	MSU	23	1315	75	14	51.4	96	2.8
26	Messina	Cran	check	8	1851	106	17	56.8	108	2.4
			Mean		1749	100	17	51.5	101.7	2.3
			C.V.		16.2			4.5	2.8	17.2
			PR > F		0.0001			0.0001	0.0001	0.0001
			LSD(0.05)		402			3.3	4.0	0.6

Design: RCBD
Row Width: Wide = 30 inch (76 cm)
Number of Rows Per Plot: 2
Number of Rows Harvested Per Plot: 2
Plot Length: 6 m
Harvest Length: 4m.
Seeding Rate: 17 seeds/m
Seed Treatment: CruiserMaxx + Dynasty

Trial Summary

Fertilizer: 30 N, 30 Slow Release N from ESN, 40 P, 50 K, 3 Zinc lbs/ac (May 23)
Herbicide: Pursuit 170 ml/ha, Bonanza 1.5 L/ha ppi (May 28)
Planting Date: May 29
Fungicide/Insecticide:Matador (100mL/ha) (July 4)
Matador (100mL/ha), Headline (400mL/ha), Allegro (1.0L/ha) (July 19)
Matador (100mL/ha), Lance (770 g/ha), (July 27)
Matador (100mL/ha) (August 13)
Dessication: Eragon (140 ml/ha), Merge (1L/ha) (September 11)
Harvest Dates: September 8, 18

2018 Wide Row Dry Bean Preliminary Yield Trial (PYT) - Woodstock

No.	Name	Type	Source	Yield Rank	Yield (kg/ha)	Yield Index	Yield/ Maturity	Seed Weight (g/100)	Days to Maturity	Harvestability (1-5; 1=good)	Plant Height (cm)
1	Inferno	LRK	SECAN	3	5430	126	52.4	71.6	103.7	2.6	39
2	Clouseau (SEM07146)	LRK	Seminis	11	4209	98	44.6	76.3	94.3	2.8	36
3	Pink Panther	LRK	Seminis	15	4086	95	44.0	68.5	92.9	2.2	27
4	K15601	LRK	MSU	23	3699	86	35.9	60.0	103.1	3.1	38
5	Dynasty	DRK	HDC	19	3958	92	40.2	76.2	98.6	3.0	35
6	Red Rover	DRK	Seminis	13	4163	97	45.1	71.6	92.4	3.5	42
7	Red Cedar (K11306)	DRK	MSU	26	3645	85	37.3	67.0	97.8	3.0	38
8	Epic (09430)	DRK	Trinity Genetics	6	4477	104	45.9	64.5	97.6	2.6	35
9	Rampart (09434)	DRK	Trinity Genetics	8	4385	102	46.0	63.4	95.4	2.2	41
10	09431	DRK	Trinity Genetics	10	4254	99	43.1	64.0	98.6	2.6	46
11	Etna	CRAN	Seminis	20	3894	90	41.5	72.4	93.8	2.5	34
12	AAC Scotty (CR318-6)	CRAN	ACUG	25	3684	85	38.9	66.9	94.7	2.6	40
13	Chianti	CRAN	Seminis	14	4101	95	42.2	73.4	97.1	3.9	39
14	151085	CRAN	Trinity Genetics	12	4168	97	41.6	69.3	100.3	2.5	33
15	151093	CRAN	Trinity Genetics	16	4065	94	41.8	65.8	97.2	2.9	37
16	16764	CRAN	Trinity Genetics	24	3696	86	38.3	68.1	96.5	2.1	40
17	16760	CRAN	Trinity Genetics	17	4019	93	42.9	59.8	93.7	2.7	41
18	Red Rider	CRAN	ACUG	9	4349	101	43.2	77.3	100.7	3.5	35
19	La Paz	Pinto	ProVita	1	5668	131	60.4	43.2	93.9	3.3	30
20	Hime	Otebo	HDC	21	3840	89	40.1	46.7	95.8	3.6	43
21	T9905	Navy	Treasure Valley	2	5494	127	54.1	31.2	101.6	2.4	44
22	Viper	sm red	Viper	4	5361	124	57.5	33.7	93.3	2.7	34
23	Zorro	Black	MSU	5	5270	122	51.0	25.4	103.3	1.7	49
24	Yeti	WK	HDC	7	4446	103	44.9	69.9	99.0	2.5	36
25	K15901	WK	MSU	18	3970	92	41.4	61.6	96.0	1.4	32
26	Messina	Cran	check	22	3770	87	40.2	56.2	93.9	2.3	28
	Mean				4311	100	44.4	61.7	97.1	2.7	37.4
	C.V.				14.4				2.0	20.0	
	LSD (0.05)				731				2.2	0.6	

Trial Summary

Design: RCBD
Row Width: Narrow = 24 inch (60 cm)
Number of Rows Per Plot: 2
Number of Rows Harvested Per Plot: 2
Plot Length: 6 m
Harvest Length: 6
Seeding Rate: 15 seeds/m
Seed Treatment: CruiserMaxxBean + Dynasty

Herbicide: Pursuit 0.22 L/ha, Dual II Magnum 1.75 L/ha
Fungicide/Insecticide:
Matador (40 ml/ha), Cygon (1 L/ha), Quadris (0.5 l/ha), Allegro (1L/ha) (July 12)
Quadris (500 ml/ha), Allegro (1L/ha) (August 10)
Planting Date: May 30
Harvest Date: September 12

Marsh Spot Analysis - Cranberry Entries to Major Coloured Bean Performance Test 2018

Trt		Elora			St. Thomas			Woodstock			Exeter			Average			2 Year Average		
		Incid	Sev	Incid X Sev	Incid	Sev	Incid X Sev	Incid	Sev	Incid X Sev	Incid	Sev	Incid X Sev	Incid	Sev	Incid X Sev	Incid	Sev	Incid X Sev
No	Treatment Name	%	(0-5)	(0-5)	%	(0-5)	(0-5)	%	(0-5)	(0-5)	%	(0-5)	(0-5)	%	(0-5)	(0-5)	%	(0-5)	(0-5)
1	Red Rider	1.5 d	1.0 c	0.02 c	8.0 b-e	1.4 bc	0.12 bcd	13.3 ef	1.5 bcd	0.20 def	5.3 c	1.2	0.07 c	7.0	1.3	0.10	4.7	1.0	0.1
2	ACUG 14-C2	2.5 d	1.0 c	0.03 c	11.5 bc	1.6 b	0.19 b	21.3 cd	1.8 ab	0.37 bc	5.8 bc	1.3	0.08 c	10.3	1.4	0.17	6.1	1.2	0.1
3	ACUG 15-C2	1.8 d	1.0 c	0.02 c	9.0 bcd	1.4 bc	0.13 bcd	15 ef	1.5 cd	0.22 de	5.8 bc	1.3	0.08 c	7.9	1.3	0.11	4.9	1.1	0.1
4	McEarly	1.5 d	1.0 c	0.02 c	4.8 de	1.2 cde	0.06 bcd	14.3 ef	1.2 ef	0.18 ef	3.0 c	1.3	0.04 c	5.9	1.2	0.08	3.1	0.7	0.0
5	Vero	10.5 b	1.2 b	0.13 b	9.3 bcd	1.5 bc	0.14 bcd	23 cd	1.5 cde	0.34 bcd	11.5 b	1.6	0.19 b	13.6	1.5	0.20	7.3	1.2	0.1
6	ACUG 17-C1	3.0 cd	1.0 c	0.03 c	4.0 de	1.0 de	0.04 cd	9.8 fg	1.2 f	0.11 ef	2.8 c	1.0	0.03 c	4.9	1.1	0.05	2.9	0.8	0.0
7	ACUG 17-C3	6.0 c	1.1 c	0.07 c	12.0 b	1.2 b-e	0.15 bc	29.5 b	1.6 bc	0.47 b	6.8 bc	1.4	0.10 bc	13.6	1.3	0.20	7.9	1.3	0.1
8	ACUG 18-NDC1	1.5 d	1.0 c	0.02 c	1.5 e	1.0 e	0.02 d	5.8 g	1 f	0.06 f	1.5 c	1.0	0.02 c	2.6	1.0	0.03			
9	SV3709GC	1.8 d	1.0 c	0.02 c	5.0 cde	1.4 bcd	0.07 bcd	18 de	1.3 def	0.24 cde	3.5 c	1.1	0.04 c	7.1	1.2	0.09			
10	Etna (Commercial Check)	3.5 cd	1.0 c	0.04 c	9.3 bcd	1.4 bcd	0.13 bcd	25.8 bc	1.3 def	0.33 bcd	6.0 bc	1.3	0.08 c	11.2	1.3	0.15	6.1	1.0	0.1
11	Messina (Susceptible Check)	41.8 a	2.4 a	1.02 a	35.3 a	2.0 a	0.70 a	47.8 a	1.9 a	0.92 a	21.8 a	1.4	0.30 a	36.7	1.9	0.74	24.9	2.1	0.5
	Mean	3.9	1.2	0.13	10.0	1.4	0.16	20.3	1.4	0.31	6.7	1.3	0.09	10.2	1.3	0.17	6.4	1.1	0.11
	CV	38.3	7.7	31.1	45.6	19.0	57.5	18.8	12.3	32.1	60.9	28.9	74.1						
	PR>F (0.05)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.451	0.000						
	LSD (0.05)	2.1	0.13	0.06	6.6	0.38	0.13	5.5	0.25	0.15	5.9	N/A	0.10						

Marsh Spot Analysis - Cranberry Entries to Major Coloured Bean Performance Test 2017

Trt		Elora			St. Thomas			Woodstock			Average		
		Incid	Sev	Incid X Sev	Incid	Sev	Incid X Sev	Incid	Sev	Incid X Sev	Incid	Sev	Incid X Sev
No	Treatment Name	%	(0-5)	(0-5)	%	(0-5)	(0-5)	%	(0-5)	(0-5)	%	(0-5)	(0-5)
1	Red Rider	0.0 b	0.0 e	0.00 b	4.0 bc	1.1 b-e	0.06 cd	3.3 ab	1.0	0.06 b	2.4	0.7	0.04
2	ACUG 14-C2	0.5 b	0.5 cde	0.01 b	3.5 cd	1.3 bcd	0.05 cd	1.8 b	1.0	0.04 b	1.9	0.9	0.03
3	ACUG 15-C2	0.0 b	0.0 e	0.00 b	3.8 cd	1.4 a-d	0.05 cd	1.8 b	1.5	0.04 b	1.9	1.0	0.03
4	McEarly	0.3 b	0.3 de	0.00 b	0.3 d	0.3 e	0.00 d	0.3 b	0.3	0.00 b	0.3	0.3	0.00
5	Ponente	0.3 b	0.3 de	0.00 b	2.8 cd	1.4 a-d	0.04 cd	0.0 b	0.0	0.00 b	1.0	0.6	0.01
6	ACUG 16-C4	1.8 b	1.3 bc	0.03 b	2.8 cd	1.4 a-d	0.04 cd	0.5 b	0.5	0.01 b	1.7	1.1	0.03
7	Vero	1.3 b	1.2 bcd	0.03 b	1.5 cd	0.8 cde	0.02 d	0.5 b	0.8	0.01 b	1.1	0.9	0.02
8	ACUG 17-C1	0.3 b	0.3 de	0.00 b	1.8 cd	0.6 de	0.02 cd	0.5 b	0.5	0.01 b	0.9	0.5	0.01
9	ACUG 17-C2	0.0 b	0.0 e	0.00 b	7.5 ab	2.1 ab	0.16 ab	1.5 b	1.3	0.02 b	3.0	1.1	0.06
10	ACUG 17-C3	0.8 b	1.8 ab	0.02 b	4.3 bc	1.7 abc	0.09 bc	1.5 b	0.6	0.02 b	2.2	1.4	0.04
11	Etna (Commercial Check)	0.0 b	0.0 e	0.00 b	2.3 cd	1.3 bcd	0.06 cd	1.0 b	1.0	0.02 b	1.1	0.8	0.03
12	Messina (Susceptible Check)	23.8 a	2.4 a	0.58 a	9.3 a	2.4 a	0.22 a	6.0 a	1.9	0.12 a	13.0	2.2	0.31
	Mean	2.4	0.7	0.06	3.6	1.3	0.07	1.5	0.9	0.03	2.5	0.9	0.05
	CV	89.7	106.7	130.5	68.0	54.5	76.1	148.6	111.3	163.4			
	PR>F (0.05)	0.000	0.000	0.000	0.000	0.010	0.000	0.048	0.276	0.038			
	LSD (0.05)	3.1	1.0	0.11	3.6	1.00	0.07	3.3	N/A	0.07			

Trt No	Treatment Name	Exeter			Woodstock			Average			Average 3 sites over 2 years		
		Incid	Sev	Incid X Sev	Incid	Sev	Incid X Sev	Incid	Sev	Incid X Sev	Incid	Sev	Incid X Sev
		%	(0-5)	(0-5)	%	(0-5)	(0-5)	%	(0-5)	(0-5)	%	(0-5)	(0-5)
1	Etna (Commercial Check)	4.8 c	1.3	0.07 bc	18.8 cd	5.1	0.35 c	11.8	3.2	0.21	8.0	2.3	0.14
2	AAC Scotty	6.0 bc	1.4	0.08 bc	33.0 b	1.8	0.59 b	19.5	1.6	0.34			
3	Chianti	4.3 c	1.1	0.05 c	11.8 cd	1.2	0.14 e	8.1	1.2	0.10	6.0	1.4	0.08
4	151085	8.0 bc	1.6	0.15 bc	20.5 c	1.6	0.33 cd	14.3	1.6	0.24			
5	151093	9.5 bc	1.3	0.13 bc	11.0 cd	1.1	0.12 e	10.3	1.2	0.13			
6	16754	14.0 ab	1.4	0.22 ab	45.8 a	2.6	1.19 a	29.9	2.0	0.71			
7	16760	8.8 bc	1.3	0.14 bc	33.0 b	2.2	0.73 b	20.9	1.8	0.44			
5	ACUG 14-C2	5.5 c	1.6	0.08 bc	10.5 d	1.6	0.16 de	8.0	1.6	0.12			
8	Messina (Susceptible Check)	18.8 a	1.6	0.31 a	54.3 a	2.0	1.07 a	36.6	1.8	0.69	26.9	1.8	0.51
	Mean	8.8	1.4	0.13	26.5	2.1	0.52	17.7	1.8	0.33	12.5	1.5	0.23
	CV	62.2	30.0	78.9	24.9	114.9	23.1						
	PR>F (0.05)	0.00	0.75	0.00	0.00	0.46	0.00						
	LSD (0.05)	8.0	N/A	0.16	9.6	N/A	0.18						

Marsh Spot Analysis of Cranberry Bean - Preliminary Yield Trials 2017

Trt No	Treatment Name	Woodstock		
		Incid	Sev	Incid X Sev
		%	(0-5)	(0-5)
1	Etna (Commercial Check)	0.3 b	0.50 bc	0.01 c
2	Chianti	1.8 b	1.80 ab	0.05 b
3	C13413	0.8 b	0.30 c	0.01 bc
4	C1017332	0.3 b	0.30 c	0.00 c
5	Messina (Susceptible Check)	7.5 a	1.90 a	0.14 a
	Mean	2.1	0.93	0.04
	CV	61.8	92.7	69.5
	PR>F (0.05)	0.00	0.04	0.00
	LSD (0.05)	2.0	1.3	0.04

2018 Anthracnose Foliar Fungicide Head to Head Early Planting
University of Guelph, Huron Research Station

Trt No.	Treatment Name	Rate	Rate Unit	Leaf Severity (%) 27 DAA	Leaf Severity (%) 35 DAA	Stem Severity (%) 27 DAA	Stem Severity (%) 35 DAA	Pod Severity (%) 27 DAA	Pod Severity (%) 35 DAA	Pod Severity (%) 68 DAA	Seed Weight (g/100)	Pick (%)	Seed Quality (1-5; 1=good)	Yield (kg/ha)	Yield - Pick (kg/ha)
1	Inoculated Control	--	--	4.8 a	6.8 a	1.7 a	4.0 a	0.3 b-e	9.9 a	40.4 a	23.8 a	5.5 abc	1.8 ab	3072 ef	2900 ghi
2	Non-inoculated Control	0.4	L/ha	0.7 e-h	0.1 g	0.3 b-e	0.0 f	0.0 e	0.0 h	11.0 i	23.7 a	1.7 ijk	1.5 abc	3293 cde	3236 cde
3	Quadris	0.5	L/ha	0.7 e-h	0.6 efg	0.3 b-e	0.5 c-f	0.0 de	0.7 e-h	23.0 d-g	25.1 a	3.3 d-i	1.4 bcd	3591 abc	3472 abc
4	Allegro	0.6	L/ha	0.9 e-h	1.1 d-g	0.1 e	0.7 c-f	0.1 cde	1.2 d-h	16.6 ghi	23.6 a	4.2 c-f	1.3 cd	3228 def	3092 d-i
5	Allegro	1	L/ha	0.7 e-h	1.1 d-g	0.3 b-e	0.7 c-f	0.0 de	1.2 c-h	16.1 ghi	24.5 a	2.5 g-k	1.3 cd	3361 b-e	3277 a-d
6	Allegro+Quadris	0.6+0.5	L/ha	0.4 gh	0.3 fg	0.2 de	0.1 ef	0.0 de	0.1 h	10.9 i	24.2 a	1.3 k	1.0 d	3220 def	3177 c-h
7	Quadris Top	0.625	L/ha	1.1 d-h	0.7 d-g	0.2 cde	0.2 def	0.0 de	0.2 gh	17.8 ghi	25.0 a	3.4 d-h	1.5 abc	3688 a	3565 ab
8	Senator	1.75	kg/ha	2.1 bc	2.5 bc	0.8 b	1.1 bcd	0.2 b-e	2.8 c	27.3 cde	24.1 a	3.1 e-j	1.4 bcd	3331 cde	3229 c-f
9	Senator	2.25	kg/ha	2.0 bcd	1.3 def	0.4 b-e	0.7 c-f	0.2 b-e	0.7 e-h	21.5 efg	24.0 a	1.9 h-k	1.0 d	3327 cde	3264 bcd
10	Fluopyram	0.5	L/ha	4.9 a	7.4 a	1.3 a	4.6 a	1.0 a	11.3 a	40.4 a	23.5 a	6.5 a	1.9 a	3083 ef	2881 hi
11	Luna Propulse	0.5	L/ha	1.5 c-f	1.5 cde	0.7 bc	1.2 bc	0.3 b-e	5.2 b	29.9 bcd	24.0 a	6.0 ab	1.8 ab	3398 a-d	3197 c-g
12	Luna Propulse	0.75	L/ha	1.7 b-e	1.2 d-g	0.5 b-e	1.0 cde	0.2 b-e	2.1 cde	23.5 d-g	24.3 a	4.8 bcd	1.3 cd	3075 ef	2929 f-i
13	Vertisan	1.25	L/ha	5.2 a	6.8 a	1.6 a	4.7 a	0.4 bc	9.9 a	37.6 ab	23.8 a	4.5 b-e	1.9 a	3079 ef	2940 e-i
14	Acapela	0.88	L/ha	0.6 fgh	0.6 efg	0.3 b-e	0.3 def	0.1 cde	0.5 fgh	18.6 f-i	24.5 a	2.7 f-k	1.1 cd	3360 b-e	3266 a-d
15	Priaxor	0.45	L/ha	0.4 gh	0.2 g	0.1 e	0.1 ef	0.0 e	0.0 h	13.3 hi	24.6 a	1.4 k	1.0 d	3442 a-d	3395 abc
16	Headline	0.4	L/ha	0.9 e-h	0.2 g	0.2 de	0.1 ef	0.0 de	0.1 h	20.9 e-h	24.9 a	1.9 h-k	1.3 cd	3488 a-d	3421 abc
17	Quash	0.28	kg/ha	2.6 b	3.5 b	0.7 bcd	2.0 b	0.2 b-e	4.8 b	32.3 bc	23.9 a	4.7 bcd	1.5 abc	3240 de	3089 d-i
18	Circobin	2.45	L/ha	1.9 bcd	1.6 cde	0.6 b-e	0.8 c-f	0.5 b	1.6 c-g	25.8 c-f	24.4 a	2.7 f-k	1.3 cd	3497 a-d	3401 abc
19	Circobin	3.15	L/ha	1.9 bcd	1.2 d-g	0.5 b-e	0.6 c-f	0.1 cde	1.8 c-f	23.4 d-g	24.7 a	2.4 g-k	1.5 abc	3653 ab	3567 a
20	Fludioxonil	1.09	L/ha	1.9 bcd	1.7 cd	0.4 b-e	1.3 bc	0.3 b-e	2.3 cd	26.3 c-f	23.5 a	3.8 d-g	1.8 ab	2929 f	2814 i
21	Cotegra	1	L/ha	1.3 c-g	1.1 d-g	0.6 b-e	0.5 c-f	0.3 bcd	2.7 cd	20.4 e-h	23.7 a	4.2 c-f	1.5 abc	3336 cde	3196 c-g
22	Delaro	0.572	L/ha	0.3 h	0.2 g	0.3 b-e	0.1 ef	0.0 e	0.0 h	11.8 i	24.9 a	1.6 jk	1.0 d	3306 cde	3252 cd
LSD (P=.05)				1.0	1.1	0.5	0.9	0.3	1.6	7.9	1.3	1.6	0.5	309	302
CV				41.3	40.9	68.1	55.7	121.9	41.6	24.1	3.8	33.1	24.7	6.6	6.7
Treatment Prob(F)				0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.2776	0.0001	0.0011	0.0002	0.0001

Means followed by same letter do not significantly differ (P=.05, LSD)

Trial Summary

Design: RCBD with 4 replications
Planting Date: May 24 6 rows @ 38 cm and 6 meter leng
Cultivar: Mist
Harvest Date: September 14 4 rows and 5 meter length
Seeding Rate: 17 seed/m of row

Inoculation Date: July 17 2018
Trt Application #1: July 16 at 7:00 AM, Temperature = 21.5 C, RH = 87%, Wind = 3 kph S, dew, soil slightly wet
Trt Application #2: July 29 at 7:00 AM, Temp = 13 C, RH = 78%, Wind = 5.7 kph SW, dew, soil slightly dry
Insecticide: Matador 83 ml/ha July 4 and August 13
Fungicide: Lance 770 g/ha July 27, August 13
Irrigation: July 13, 18, 19, 20 and August 14

Conclusions:

* disease pressure was moderately high, compared to past work
* all fungicides were applied twice (1st flower and 14 days later)
* The two standard controls, Quadris and Headline, were equivalent to the non-inoculated control for disease severity until the last pod rating (56 DAA), and had similar yield to the non-inoculated control
* Allegro, Acapela and Cotegra had similar disease control to Quadris and Headline. Yield was similar to the non-inoculated control
* Allegro+Quadris and Delaro had very low disease levels, and average yield.
* Senator and Propulse had similar disease levels as Quadris, and yield similar to the non-inoculated control.
*Circobin was similar to Quadris for disease levels and yield. Circobin had the highest yield-pick of any fungicide treatment.
* Quadris Top had similar disease levels as Quadris, but had the highest yield in the study
* Fludioxonil had similar disease levels as Quadris, but had the lowest yield in the study
* Fluopyram, Vertisan and Quash had higher disease severity than Quadris, and this generally impacted yield as well

2018 Anthracnose Foliar Fungicide Head to Head Late Planting
University of Guelph, Huron Research Station

Trt No.	Treatment Name	Rate	Rate Unit	Leaf Severity (%) 11 DAA	Leaf Severity (%) 21 DAA	Stem Severity (%) 27 DAA	Stem Severity (%) 35 DAA	Pod Severity (%) 27 DAA	Pod Severity (%) 35 DAA	Pod Severity (%) 56 DAA	Seed Weight (g/100)	Pick (%)	Yield (kg/ha)	Yield - Pick (kg/ha)
1	Inoculated Control	--	--	16.7 a	21.7 a	9.1 a	25.3 a	0.5 a	26.4 a	37.8 a	20.6 k	4.1 c-i	2597 k	2489 j
2	Non-inoculated Control	--	--	0.0 h	0.0 l	0.0 g	0.0 h	0.0 c	0.1 j	2.7 j	22.6 b-e	3.1 i	3582 abc	3472 abc
3	Quadris	0.5	L/ha	1.5 gh	2.0 i-l	0.5 fg	1.9 e-h	0.0 c	3.8 ghi	18.5 gh	22.5 cde	3.6 ghi	3364 c-f	3244 cde
4	Allegro	0.6	L/ha	0.7 h	4.0 g-j	0.1 g	4.2 def	0.0 c	6.3 efg	19.4 g	22.5 b-e	5.2 a-g	3444 b-e	3265 cde
5	Allegro	1	L/ha	0.3 h	2.2 i-l	0.1 g	2.2 e-h	0.0 c	3.3 g-j	14.2 h	22.6 b-e	5.5 a-d	3529 a-d	3335 bcd
6	Allegro+Quadris	0.6+0.5	L/ha	0.2 h	0.5 l	0.1 g	0.4 gh	0.0 c	0.0 j	3.5 j	23.2 ab	3.8 e-i	3658 ab	3516 ab
7	Quadris Top	0.625	L/ha	0.5 h	1.2 kl	0.3 fg	0.7 gh	0.0 c	1.8 hij	8.7 i	22.3 def	4.0 d-i	3508 bcd	3365 bcd
8	Senator	1.75	kg/ha	5.1 ef	5.1 e-h	1.6 ef	4.4 de	0.1 c	9.2 de	25.0 ef	22.0 e-h	5.3 a-f	3323 d-g	3145 def
9	Senator	2.25	kg/ha	3.5 fg	3.6 h-k	1.0 efg	3.8 efg	0.0 c	7.8 ef	27.0 def	22.2 efg	4.9 a-h	3542 a-d	3368 bcd
10	Fluopyram	0.5	L/ha	16.3 ab	17.5 b	7.7 ab	15.4 b	0.3 abc	19.7 b	37.3 a	20.6 k	4.6 b-i	2884 j	2753 hi
11	Luna Propulse	0.5	L/ha	7.9 cd	7.7 de	4.8 c	7.5 cd	0.0 c	11.6 cd	35.3 ab	21.5 ghi	6.0 ab	2990 ij	2811 ghi
12	Luna Propulse	0.75	L/ha	6.4 de	6.9 def	4.9 c	7.6 cd	0.2 bc	7.5 ef	26.8 def	21.5 g-j	5.8 abc	3098 g-j	2919 f-i
13	Vertisan	1.25	L/ha	14.0 b	17.1 b	6.7 b	16.0 b	0.5 ab	17.1 b	37.8 a	20.8 jk	5.3 a-f	2879 j	2727 ij
14	Acapela	0.88	L/ha	0.8 h	2.1 i-l	0.7 fg	2.3 e-h	0.0 c	5.1 fgh	16.8 gh	23.5 a	4.3 c-i	3594 abc	3441 abc
15	Priaxor	0.45	L/ha	0.2 h	0.9 kl	0.1 g	0.8 fgh	0.0 c	1.6 ij	5.9 ij	22.6 b-e	3.4 hi	3606 abc	3484 abc
16	Headline	0.4	L/ha	0.9 h	1.4 jkl	0.2 fg	0.9 fgh	0.0 c	2.2 hij	6.4 ij	23.1 a-d	3.9 d-i	3603 abc	3462 abc
17	Quash	0.28	kg/ha	4.5 ef	8.4 d	2.4 de	7.4 cd	0.1 c	12.9 c	32.4 bc	21.2 ijk	5.5 a-e	3028 hij	2862 ghi
18	Circobin	2.45	L/ha	6.4 de	8.5 d	2.2 e	7.4 cd	0.1 c	13.2 c	29.0 cde	21.3 h-k	6.4 a	3257 e-h	3048 efg
19	Circobin	3.15	L/ha	3.5 fg	4.4 f-i	1.2 efg	3.6 efg	0.0 c	8.5 de	24.3 f	22.5 cde	3.9 d-i	3491 b-e	3354 bcd
20	Fludioxonil	1.09	L/ha	9.0 c	11.4 c	3.9 cd	9.0 c	0.1 c	13.8 c	28.0 c-f	21.6 f-i	5.3 a-f	2949 ij	2792 hi
21	Cotegra	1	L/ha	6.3 de	6.6 d-g	5.0 c	8.3 c	0.3 abc	8.1 ef	31.0 bcd	21.7 f-i	5.3 a-f	3155 f-i	2988 fgh
22	Delaro	0.572	L/ha	0.3 h	1.0 kl	0.1 fg	0.5 gh	0.0 c	0.9 ij	3.7 j	23.1 abc	3.8 f-i	3765 a	3621 a
LSD (P=.05)				2.3	2.8	1.5	3.5	0.3	3.4	4.5	0.7	1.7	246.8	243.7
CV				34.5	32.4	45.2	41.6	208.1	28.8	14.8	2.4	25.4	5.27	5.46
Treatment Prob(F)				0.0001	0.0001	0.0001	0.0001	0.0032	0.0001	0.0001	0.0001	0.0033	0.0001	0.0001

Means followed by same letter do not significantly differ (P=.05, LSD)

Trial Summary

Design: RCBD with 4 replications
Planting Date: June 20 6 rows @ 38 cm and 6 meter length
Cultivar: Mist
Harvest Date:October 8 4 rows and 5 meter length
Seeding Rate: 17 seed/m of row

Inoculation Date: August 9 2018
Trt Application #1: August 9 at 7:00 AM, Temperature = 15.5 C, RH = 98%, Wind = 0 kph S, dew, soil wet
Trt Application #2: August 23 at 7:00 AM, Temp = 11.8 C, RH = 95%, Wind = 2.0 kph S, dew, soil slightly wet
Insecticide: Matador 83 ml/ha August 13
Fungicide: Lance 770 g/ha August 13, 30
Irrigation: July 13 and August 14, 15

Conclusions:

* disease pressure was moderately high, compared to past work
* all fungicides were applied twice (1st flower and 14 days later)
* Headline was equivalent to the non-inoculated control for disease severity and had similar yield
* Quadris was equivalent to the non-inoculated control for disease severity until the last pod rating (56 DAA), but had similar yield
* Allegro and Acapela had similar disease control and yield as Quadris.
* Allegro+Quadris and Quadris Top had very low disease levels, and good yield.
* Senator, Circobin and Propulse had higher disease levels than Quadris. In some cases yield was lower than the non-inoculated control.
* Fludioxonil, Quash and Cotegra had disease levels and yield that were slightly better than the Inoculated control
* Fluopyram and Vertisan were similar to the inoculated control for disease levels and yield

2018 Anthracnose Fungicide x Fertilizer in Dry Bean 1st Planting

University of Guelph, Huron Research Station

				% Leaf Severity		% Stem Severity		% Pod Severity			100 Seed	Seed	Seed		
			Rate	16	24	16	24	16	24	56	Weight	Pick	Quality	Yield	Yield-Pick
Factor A (Fungicide)			(L/ha)	.days after application.		.days after application		….days after application….			(g/100)	(%)	(1-5; 1=good)	(kg/ha)	(kg/ha)
1	Control		--	5.5 d	10.4	2.7	8.0 c	0.5 c	13.9	43.3	23.8 a	4.9 c	1.8 c	3018 a	2869 a
2	Headline		0.4	0.6 a	0.6	0.2	0.2 a	0.0 a	0.3	5.6	24.9 b	2.6 a	1.3 a	3602 c	3510 c
3	Quadris		0.5	1.2 b	1.2	0.3	0.7 a	0.0 a	1.1	12.6	24.9 b	3.6 ab	1.5 ab	3538 b	3410 b
4	Allegro		1.0	1.4 b	1.6	0.4	1.0 a	0.0 a	1.5	18.8	24.7 b	4.2 b	1.5 ab	3422 b	3277 b
5	Propulse		0.8	2.2 c	2.2	1.2	2.4 b	0.2 b	5.1	26.9	24.5 b	5.3 c	1.6 b	3459 b	3275 b
Factor B (Fertilizer)															
1	Control		--	2.4 bc	3.9	1.0	3.3 b	0.1	6.0	25.3	24.9 b	4.4	1.4	3408	3261
2	Crop Booster		5.0	2.1 b	3.3	1.1	2.6 b	0.2	4.4	23.6	24.9 b	4.1	1.5	3404	3265
3	Releaf Mn		5.0	2.7 c	3.6	1.1	2.7 b	0.2	4.9	23.5	25.0 b	4.2	1.6	3385	3243
4	Phi 42K		5.0	1.6 a	2.0	0.7	1.4 a	0.1	2.2	13.3	23.3 a	3.8	1.6	3435	3305
Factor A x B															
1	Control	Control	--	5.1	12.2 d	2.3 d	9.7	0.3	16.8 d	42.9 e	23.5	4.9	1.6	2831	2691
2	Headline	Control	0.4	0.8	0.8 a	0.3 a	0.4	0.0	0.4 a	7.2 a	25.8	1.9	1.1	3726	3654
3	Quadris	Control	0.5	1.5	1.3 a	0.3 a	1.2	0.0	2.2 a	17.5 b	25.3	4.6	1.5	3560	3396
4	Allegro	Control	1.0	1.3	2.0 ab	0.7 ab	1.5	0.0	2.3 a	23.9 c	24.9	4.9	1.3	3403	3238
5	Propulse	Control	0.8	3.0	3.0 b	1.3 bc	3.5	0.4	8.2 c	35.3 d	25.3	5.6	1.6	3520	3325
6	Control	Crop Booster	--	5.5	11.6 d	3.4 e	8.9	0.6	15.4 d	47.8 e	24.8	5.0	1.8	2921	2775
7	Headline	Crop Booster	0.4+5.0	0.7	0.6 a	0.2 a	0.2	0.0	0.3 a	8.0 a	24.9	2.6	1.0	3572	3481
8	Quadris	Crop Booster	0.5+5.0	1.1	1.0 a	0.2 a	0.3	0.0	0.7 a	13.3 b	25.4	3.0	1.4	3696	3584
9	Allegro	Crop Booster	1.0+5.0	1.3	1.7 a	0.3 a	1.3	0.1	1.7 a	20.0 bc	25.1	4.1	1.4	3463	3319
10	Propulse	Crop Booster	0.75+5.0	1.9	1.8 a	1.2 b	2.3	0.2	4.1 b	29.3 d	24.5	6.0	1.8	3367	3165
11	Control	Releaf Mn	--	6.8	10.7 d	3.3 e	8.2	0.8	15.0 d	44.3 e	24.1	5.7	2.0	3076	2901
12	Headline	Releaf Mn	0.4+5.0	0.8	0.7 a	0.2 a	0.3	0.1	0.3 a	4.3 a	25.3	2.0	1.4	3638	3565
13	Quadris	Releaf Mn	0.5+5.0	1.3	1.9 ab	0.3 a	1.0	0.0	1.4 a	14.7 b	25.9	3.0	1.3	3426	3325
14	Allegro	Releaf Mn	1.0+5.0	2.3	2.3 b	0.5 a	1.2	0.0	1.9 a	26.0 c	24.9	4.6	1.6	3357	3202
15	Propulse	Releaf Mn	0.75+5.0	2.3	2.3 b	1.4 c	2.8	0.3	6.0 b	28.3 cd	24.9	5.9	1.5	3426	3222
16	Control	Phi 42K	--	4.6	7.0 c	1.9 c	5.1	0.4	8.6 c	38.5 cd	22.6	4.1	1.8	3244	3110
17	Headline	Phi 42K	0.4+5.0	0.3	0.3 a	0.3 a	0.1	0.0	0.1 a	2.7 a	23.5	3.8	1.5	3472	3342
18	Quadris	Phi 42K	0.5+5.0	0.9	0.8 a	0.3 a	0.4	0.0	0.2 a	5.1 a	23.1	3.9	1.8	3469	3337
19	Allegro	Phi 42K	1.0+5.0	0.7	0.5 a	0.2 a	0.2	0.0	0.2 a	5.3 a	24.0	3.3	1.6	3464	3349
20	Propulse	Phi 42K	0.75+5.0	1.7	1.5 a	0.9 b	1.2	0.1	1.9 a	14.8 b	23.2	3.9	1.5	3524	3386
	Pr>F (A)			0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0014	0.0001	0.0001
	Pr>F (B)			0.0002	0.0001	0.0147	0.0004	0.1684	0.0001	0.0001	0.0001	0.6193	0.2422	0.9131	0.8592
	Pr>F (AB)			0.1027	0.0119	0.0016	0.1838	0.2114	0.0233	0.0167	0.1017	0.1812	0.3901	0.3554	0.1896
	LSD 0.05 (A)			0.5	NA	NA	0.9	0.1	NA	NA	0.5	1.0	0.2	170	165
	LSD 0.05 (B)			0.4	NA	NA	0.8	NS	NA	NA	0.5	NS	NS	NS	NS
	LSD 0.05 (AB)			NS	1.7	0.6	NS	NS	2.9	7.1	NS	NS	NS	NS	NS

Trial Summary

Design: RCBD with 4 replications
Planting Date: May 24 6 rows @ 38 cm and 6 meter length
Cultivar: Mist
Harvest Date: September 14 4 rows and 4 meter length
Seeding Rate: 17 seed/m of row

Inoculation Date: July 17 2018
Trt Application #1: July 17 at 9:00 AM, Temperature = 25.7 C, RH = 78%, Wind = 8 kph SW, dew, soil slightly wet
Trt Application #2: July 29 at 10:00 AM, Temp = 21.2 C, RH = 75%, Wind = 3 kph W, dew, soil slightly wet
Insecticide: Matador 83 ml/ha July 4 and August 13
Fungicide: Lance 770 g/ha August 13
Irrigation: July 13, 18, 19, 20 and August 14

Conclusions:

* disease pressure was moderate, compared to past work
* all fungicides were applied twice (1st flower and 14 days later)
* Headline provided superior control of leaf, stem and pod disease, followed by Quadris, Allegro and lastly Propulse
* Phi 42K reduced disease severity in leaf, stem and pod tissue compared to the untreated control, but did not increase seed yield
* the addition of Phi 42K improved the performance of Quadris, Allego and Propulse compared to the fungicide alone or the fungicide combined with any other foliar fertilizer
* the use of a fungicide or Phi 42K fertilizer increased seed weight, compared to the untreated control or any other foliar fertilizer
* Headline and Quadris had the lowest pick, followed by Allegro. Propulse had similar pick as the untreated control.
* the application of a fungicide improved visual seed quality. Headline had the best seed quality.
* Headline had the highest yield of the fungicide treatments, followed by Quadris, Allegro and Propulse

2018 Anthracnose Fungicide x Fertilizer in Dry Bean 2nd Planting

University of Guelph, Huron Research Station

				% Leaf Severity		% Stem Severity		% Pod Severity			100 Seed	Seed		
			Rate	16	24	16	24	16	24	56	Weight	Pick	Yield	Yield-Pick
Factor A (Fungicide)			(L/ha)	…days after application…		…days after application.		…days after application….			(g/100)	(%)	(kg/ha)	(kg/ha)
1	Control		--	18.9	22.2	15.0	24.1	13.0	24.4	35.4	20.6	4.2 a	2848 b	2729 c
2	Headline		0.4	0.4	1.6	0.4	1.3	0.1	3.0	4.6	22.2	2.9 c	3434 a	3335 a
3	Quadris		0.5	0.5	1.6	0.3	1.4	0.1	2.9	9.2	22.2	3.4 bc	3363 a	3247 a
4	Allegro		1.0	1.2	3.7	1.0	3.6	0.5	5.1	9.2	22.2	3.7 b	3427 a	3302 a
5	Propulse		0.8	4.0	4.4	5.1	5.5	2.4	6.0	19.4	21.7	4.8 a	3305 a	3148 b
Factor B (Fertilizer)														
1	Control		--	7.1	8.2	6.0	8.7	5.3	10.2	19.5	21.8	3.9 a	3285 ab	3159 b
2	Crop Booster		5.0	4.8	7.1	4.4	8.2	3.3	9.4	17.7	21.9	4.0 a	3226 b	3096 b
3	Releaf Mn		5.0	4.4	6.7	3.9	7.0	3.3	8.4	15.5	22.1	4.1 a	3188 b	3057 b
4	Phi 42K		5.0	3.9	4.6	3.0	4.7	0.9	4.9	9.5	21.3	3.1 b	3403 a	3297 a
Factor A x B														
1	Control	Control	--	26.0 d	27.5 e	21.7 f	31.2 e	21.1 d	30.8 e	44.5 d	20.9 b	5.0	2726	2587
2	Headline	Control	0.4	0.4 a	2.0 a	0.4 a	1.2 a	0.1 a	3.5 a	4.0 a	22.8 d	3.1	3679	3564
3	Quadris	Control	0.5	1.1 a	1.9 a	0.3 a	1.6 a	0.0 a	3.5 a	12.9 b	22.1 cd	3.9	3394	3261
4	Allegro	Control	1.0	1.4 a	3.5 a	1.4 a	3.1 a	0.5 a	4.4 a	9.5 b	22.2 cd	2.9	3406	3309
5	Propulse	Control	0.8	6.6 b	6.4 b	6.4 c	6.4 b	5.0 b	9.2 b	26.6 c	21.2 b	4.5	3218	3074
6	Control	Crop Booster	--	16.6 c	22.6 d	14.0 e	25.8 d	12.9 c	24.4 d	38.3 d	20.6 ab	4.4	2669	2551
7	Headline	Crop Booster	0.4+5.0	0.6 a	1.7 a	0.4 a	1.8 a	0.1 a	4.2 a	3.8 a	22.4 d	2.8	3312	3220
8	Quadris	Crop Booster	0.5+5.0	0.3 a	1.8 a	0.2 a	1.7 a	0.0 a	4.2 a	9.0 ab	22.2 cd	3.2	3347	3240
9	Allegro	Crop Booster	1.0+5.0	1.9 a	4.4 b	1.5 a	5.2 b	0.8 a	7.3 b	15.3 b	22.3 d	4.3	3420	3273
10	Propulse	Crop Booster	0.75+5.0	4.5 b	5.2 b	6.1 c	6.7 b	2.9 a	7.0 b	22.4 c	21.9 c	5.5	3380	3194
11	Control	Releaf Mn	--	17.4 c	22.6 d	14.2 e	24.0 d	14.2 c	26.0 d	36.0 d	21.0 b	4.2	2907	2786
12	Headline	Releaf Mn	0.4+5.0	0.4 a	1.9 a	0.4 a	1.5 a	0.2 a	3.7 a	2.8 a	22.5 d	2.6	3314	3228
13	Quadris	Releaf Mn	0.5+5.0	0.5 a	1.9 a	0.3 a	1.5 a	0.4 a	2.7 a	8.8 ab	22.6 d	3.5	3263	3146
14	Allegro	Releaf Mn	1.0+5.0	1.1 a	4.6 b	0.8 a	4.4 b	0.7 a	5.5 b	9.6 b	22.2 cd	4.8	3369	3208
15	Propulse	Releaf Mn	0.75+5.0	2.6 ab	2.7 a	3.9 b	3.8 b	1.1 a	4.2 a	20.4 c	22.2 cd	5.5	3087	2917
16	Control	Phi 42K	--	15.8 c	16.1 c	10.0 d	15.5 c	4.0 b	16.3 c	23.0 c	19.9 a	3.3	3092	2992
17	Headline	Phi 42K	0.4+5.0	0.3 a	0.7 a	0.4 a	0.7 a	0.0 a	0.6 a	7.8 ab	21.1 b	3.0	3429	3327
18	Quadris	Phi 42K	0.5+5.0	0.3 a	0.9 a	0.3 a	0.7 a	0.0 a	1.1 a	6.2 a	22.1 c	3.1	3448	3342
19	Allegro	Phi 42K	1.0+5.0	0.5 a	2.4 a	0.4 a	1.7 a	0.0 a	3.2 a	2.2 a	22.1 c	2.7	3514	3418
20	Propulse	Phi 42K	0.75+5.0	2.5 ab	3.1 a	4.2 b	4.9 b	0.7 a	3.6 a	8.1 ab	21.5 bc	3.6	3534	3407
	Pr>F (A)			0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
	Pr>F (B)			0.0001	0.0008	0.0001	0.0001	0.0001	0.0001	0.0001	0.0005	0.0054	0.0091	0.0023
	Pr>F (AB)			0.0003	0.0269	0.0001	0.0001	0.0001	0.0491	0.0149	0.0394	0.0680	0.0989	0.0960
	LSD 0.05 (A)			NA	NA	NA	NA	NA	NA	NA	NA	0.7	145	143
	LSD 0.05 (B)			NA	NA	NA	NA	NA	NA	NA	NA	0.6	129	128
	LSD 0.05 (AB)			2.9	3.8	1.8	3.7	3.8	4.9	8.7	0.8	NS	NS	NS

Trial Summary

Design: RCBD with 4 replications
Planting Date: June 20 6 rows @ 38 cm and 6 meter leng
Cultivar: Mist
Harvest Date:October 9 4 rows and 4 meter length
Seeding Rate: 17 seed/m of row

Inoculation Date: August 9 2018
Trt Application #1: August 9 at8:30 AM, Temperature = 18.6 C, RH = 97%, Wind = 3.8 kph SW, dew, soil wet
Trt Application #2: August 23 at 8:30 AM, Temp = 14.5 C, RH = 92%, Wind = 2.0 kph SW, dew, soil slightly wet
Insecticide: Matador 83 ml/ha August 13
Fungicide: Lance 770 g/ha August 30
Irrigation: July 13 and August 14, 15

Conclusions:

* disease pressure was moderate, compared to past work
* all fungicides were applied twice (1st flower and 14 days later)
* Headline provided superior control of leaf, stem and pod disease, followed by Quadris, Allegro and lastly Propulse
* Phi 42K reduced disease severity in leaf, stem and pod tissue compared to the untreated control and had higher yield that the other foliar fungicides
* the addition of Phi 42K improved the performance of Quadris, Allego and Propulse compared to the fungicide alone or the fungicide combined with any other foliar fertilizer
* Headline increased seed weight the most, followed by Quadris, then Allegro, then Propulse
* Headline and Quadris had the lowest pick, followed by Allegro while Propulse had similar pick as the untreated control.
* Phi42K had lower pick than the untreated control or any other foliar fertilizer
* Headline had the highest yield of the fungicide treatments
* for Yield-Pick, Headline, Quadris and Allegro had higher yield than Propulse, which in turn had higher yield than the untreated control.

2018 Anthracnose Seed Treatment Head to Head Dry Bean 1st Planting

University of Guelph, Huron Research Station

Trt No.	Treatment Name	Rate (g ai/100 kg)	Plant Emergence 7 DAP	Plant Emergence 14 DAP	Vigour (1-10, 10=good) 7 DAP	Vigour (1-10, 10=good) 14 DAP	Leaf Vein Disease Severity (%) 71 DAP	Leaf Vein Disease Severity (%) 84 DAP	Stem Disease Severity (%) 71 DAP	Stem Disease Severity (%) 84 DAP	Pod Disease Severity (%) 84 DAP	Pod Disease Severity (%) 110 DAP	Seed Weight (g/100)	Seed Quality (1-5; 1=good)	Pick (%)	Yield (kg/ha)	Yield - Pick (kg/ha)
1	Noninoculated Control + Cruiser	50	64.5 a	93.9 a	9.0 a	9.0 a	0.2 c	0.2 b	0.2 c	0.1 b	0.2 b	3.3 e	24.5 a	1.1 a	1.5 e	3111 a	3022 a
2	Inoculated Control + Cruiser	50	61.0 a	88.1 a	6.8 bcd	7.5 cd	2.2 a	6.2 a	1.4 a	8.2 a	10.7 a	24.6 a	23.2 a	1.5 a	4.5 a	3095 a	2815 a
3	Cruiser MaxxBean	56.25	64.2 a	98.0 a	7.0 bc	8.0 bc	1.0 bc	1.8 b	0.6 bc	1.7 b	2.3 b	13.1 cd	23.6 a	1.4 a	2.9 bcd	3198 a	3018 a
4	Cruiser MaxxBean + Dynasty	56.25+1	49.1 a	92.5 a	5.3 e	6.3 e	0.4 c	0.1 b	0.1 c	0.1 b	0.2 b	9.0 de	23.5 a	1.4 a	1.9 de	3264 a	3137 a
5	Cruiser MaxxBean + Sedaxane	56.25+5.0	63.9 a	98.9 a	6.5 cd	7.5 cd	1.7 ab	5.4 a	1.3 ab	5.5 a	8.5 a	19.8 ab	24.1 a	1.5 a	3.7 ab	3085 a	2851 a
6	Cruiser MaxxBean + Dynasty + Sedaxane	56.25+1+5.0	58.9 a	92.6 a	5.8 de	7.0 de	0.5 c	0.8 b	0.2 c	0.4 b	0.6 b	13.4 cd	23.5 a	1.3 a	2.6 bcd	3300 a	3123 a
7	Rancona Summit + Cruiser	4.06+50	65.4 a	94.3 a	7.8 b	8.5 ab	0.5 c	1.3 b	0.3 c	1.0 b	1.4 b	16.1 bc	24.4 a	1.6 a	2.9 bcd	2950 a	2776 a
8	Rancona Summit + Cruiser + Maxim	4.06+50+2.2	66.9 a	95.4 a	7.3 bc	8.0 bc	0.7 c	1.3 b	0.3 c	1.4 b	1.7 b	16.0 bc	23.6 a	1.6 a	2.9 bcd	3325 a	3131 a
9	Rancona Summit+Cruiser+Maxim+Sedaxane	4.06+50+2.2+5.0	67.4 a	98.3 a	6.8 bcd	7.3 cd	0.6 c	1.0 b	0.3 c	0.5 b	1.4 b	14.4 bcd	23.5 a	1.5 a	3.2 bc	3187 a	2985 a
10	Rancona Summit+Cruiser+Maxim+Sedaxane+Dynasty	4.06+50+2.2+5.0+1	61.2 a	96.0 a	6.3 cde	7.0 de	0.3 c	0.6 b	0.1 c	0.2 b	0.2 b	12.0 cd	24.4 a	1.1 a	1.9 de	3403 a	3276 a
11	Evergol Energy+Cruiser	11.5+50	66.5 a	98.3 a	7.8 b	8.5 ab	0.8 c	0.7 b	0.2 c	0.4 b	0.3 b	13.1 cd	24.0 a	1.4 a	2.4 cde	3227 a	3070 a
12	Insure Pulse +Cruiser	14+50	64.1 a	94.7 a	6.5 cd	7.8 bcd	0.3 c	1.3 b	0.2 c	1.2 b	1.7 b	15.0 bcd	24.0 a	1.6 a	2.5 cde	3123 a	2969 a
LSD (P=.05)			--	--	1.2	0.9	0.9	3.1	0.8	3.2	5.1	6.3	--	--	1.1	--	--
CV			12.7	5.9	11.6	8.3	81.1	123.2	127.9	129.8	144.7	30.8	4.3	22.0	28.9	7.9	8.3
Treatment Prob(F)			0.1541	0.2740	0.0001	0.0001	0.0013	0.0025	0.0098	0.0001	0.0011	0.0001	0.7255	0.2549	0.0004	0.4905	0.2166

Means followed by same letter do not significantly differ (P=.05, LSD)

Trial Summary

Design: RCBD with 4 replications
Planting Date: May 24 6 rows @ 38 cm ,6 meter length
Cultivar: Mist
Harvest Date: September 14 4 rows, 5 meter length
Seeding Rate: 17 seed/m of row

Herbicide: Dual II Magnum+Pursuit 1.7 + 0.17 l/ha May 24
Herbicide: Assure II + Assure Mix 0.6 l/ha + 0.3% v/v June 29
Insecticide: Matador 83 ml/ha July 4, August 13
Fungicide: Lance 770 g/ha July 27, August 13
Irrigation: July 13, 18, 19, 20 and August 14

Conclusions:

* disease pressure on pod tissue was moderate, compared to past work. Disease on leaf veins and stems were low.
* uninfected seed was used for the non-inoculated control, and Quadris/Headline was applied every two weeks starting at 42 DAP
* seed treatments did not impact plant emergence, but most reduced plant vigour. Treatments containing Dynasty had the lowest plant vigour
* There were few consistent differences between treatments for leaf vein disease severity. Cruiser Maxx Bean treatments that did not contain Dynasty tended to have high leaf disease.
* Only trt 5 (Cruiser Maxx Bean + Sedaxane) had stem disease severity as high as the inoculated control.
* adding Dynasty to Cruiser Maxx Bean treatments (Trt 4 vs 3, trt 6 vs 5) reduced pod disease and pick scores. Rancona Summit + Dynasty did not reduce pod disease, but reduced pick
* Evergol Energy and Insure Pulse reduced anthracnose pod disease severity, compared to the inoculated control.
* the treatment differences for plant vigour and anthracnose disease severity did not result in differences in seed weight or yield at harvest.

2018 Anthracnose Seed Treatment Head to Head Dry Bean 2nd Planting

University of Guelph, Huron Research Station

Trt No.	Treatment Name	Rate (g ai/100 kg)	Leaf Vein Disease Severity (%) 67 DAP	Leaf Vein Disease Severity (%) 85 DAP	Leaf Vein Disease Severity (%) 96 DAP	Stem Disease Severity (%) 85 DAP	Stem Disease Severity (%) 96 DAP	Pod Disease Severity (%) 96 DAP	Pod Disease Severity (%) 119 DAP	Seed Weight (g/100)	Seed Quality (1-5; 1=good)	Pick (%)	Yield (kg/ha)	Yield - Pick (kg/ha)
1	Noninoculated Control + Cruiser	50	0.0 c	0.0 e	1.0 e	0.0 d	1.0 d	1.1 d	6.8 e	22.8 a	1.3 a	3.1 c	3698 a	3473 a
2	Inoculated Control + Cruiser	50	2.3 a	11.3 a	19.9 a	11.4 a	37.6 a	32.1 a	46.5 a	21.0 a	2.0 a	6.3 a	2727 e	2384 c
3	Cruiser MaxxBean	56.25	0.5 bc	4.0 bc	12.5 bc	3.5 bc	21.4 bc	18.4 bc	36.5 bc	21.0 a	1.9 a	6.6 a	3041 b-e	2639 bc
4	Cruiser MaxxBean + Dynasty	56.25+1	0.2 c	0.8 e	5.9 de	0.8 cd	11.8 cd	13.3 c	33.5 bcd	21.3 a	1.6 a	5.7 ab	3313 b	2939 b
5	Cruiser MaxxBean + Sedaxane	56.25+5.0	0.9 b	5.7 b	14.8 ab	5.1 b	28.2 ab	26.0 ab	40.5 ab	21.7 a	1.5 a	5.9 ab	2962 cde	2613 bc
6	Cruiser MaxxBean + Dynasty + Sedaxane	56.25+1+5.0	0.2 c	1.5 cde	7.1 d	0.8 cd	10.7 cd	10.9 cd	33.8 bcd	21.8 a	1.8 a	6.5 a	3259 bc	2837 b
7	Rancona Summit + Cruiser	4.06+50	0.4 bc	2.4 cde	8.8 cd	2.0 bcd	16.8 c	14.1 c	36.3 bc	21.5 a	1.5 a	5.2 ab	3070 bcd	2753 b
8	Rancona Summit + Cruiser + Maxim	4.06+50+2.2	0.2 c	2.8 b-e	8.4 cd	2.4 bcd	15.8 c	15.0 c	34.3 bcd	21.5 a	1.6 a	4.7 abc	3200 bcd	2907 b
9	Rancona Summit+Cruiser+Maxim+Sedaxane	4.06+50+2.2+5.0	0.4 bc	1.6 cde	6.5 d	1.4 cd	11.7 cd	10.4 cd	30.8 cd	22.1 a	1.5 a	5.3 ab	3245 bc	2909 b
10	Rancona Summit+Cruiser+Maxim+Sedaxane+Dynasty	4.06+50+2.2+5.0+1	0.1 c	1.0 de	6.8 d	0.9 cd	12.7 c	11.0 cd	27.5 d	22.2 a	1.6 a	6.1 ab	3174 bcd	2786 b
11	Evergol Energy+Cruiser	11.5+50	0.5 bc	2.2 cde	9.0 cd	1.5 cd	16.9 bc	16.1 bc	32.5 bcd	21.5 a	1.8 a	4.9 abc	3265 bc	2959 b
12	Insure Pulse +Cruiser	14+50	0.4 bc	3.9 bcd	10.6 bcd	3.7 bc	18.8 bc	17.9 bc	34.8 bcd	21.7 a	1.5 a	4.2 bc	2898 de	2658 bc
LSD (P=.05)			0.6	3.0	5.3	3.1	11.4	10.3	8.5	--	--	2.1	334	368
CV			87.9	67.0	39.8	77.8	46.6	46.0	17.9	4.0	26.9	27.1	7.3	9.0
Treatment Prob(F)			0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.2491	0.6082	0.0469	0.0004	0.0005

Means followed by same letter do not significantly differ (P=.05, LSD)

Trial Summary

Design: RCBD with 4 replications
Planting Date: June 20 6 rows @ 38 cm ,6 meter length
Cultivar: Mist
Harvest Date: October 8 4 rows, 5 meter length
Seeding Rate: 17 seed/m of row

Herbicide: Dual II Magnum+Pursuit 0.17+1.7 l/ha June 2 pre
Herbicide: Assure II + Assure Mix 0.6 l/ha + 0.3% v/v June 29
Desiccant: Eragon LQ + Merge 0.146 + 1 l/ha, Sept 27
Insecticide: Matador 83 ml/ha August 13
Fungicide: Lance 770 g/ha August 13, 30
Irrigation: July 13, 18 and August 14, 15

Conclusions:

* disease pressure on pod tissue was moderately high, compared to past work. Disease on leaf veins and stems were low.
* uninfected seed was used for the non-inoculated control, which had slightly poorer emergence and vigour. Quadris/Headline were applied every two weeks starting at 42 DAP
* seed treatments did not impact plant emergence, but trt 4 (Cruiser Maxx Bean + Dynasty) reduced plant vigour slightly.
* Cruiser Maxx Bean reduced leaf vein, stem and pod disease severity. Adding Dynasty gave a further reduction in disease on all tissues, while the addition of Sedaxane had no effect.
* Rancona Summit reduced leaf, stem and pod disease severity. Adding Dynasty gave a further reduction in disease on all tissues, while the addition of Sedaxane had no effect.
* Trt 10 (Rancona Summit+Cruiser+Maxim+Sedaxane+Dynasty) had the lowest pod disease severity at harvest.
* Evergol Energy and Insure Pulse gave a moderate reduction in anthracnose disease severity on leaves, stems and pods, compared to the inoculated control. Insure Pulse had the lowest pick scores of any seed treatment.
* Treatments containing Dynasty (trt. 4, 6 and 10) had some of the highest yields. The addition of Rancona Summit did not provide a yield increase.
* Evergol Energy had one of the highest yields, while Insure Pulse had the lowest yield of any seed treatment

2018 Foliar Fungicide in Dry Beans - White Mold Control Early Planting

University of Guelph, Huron Research Station

Trt. No.	Treatment Name	Rate (g ai/ha)	Timing	Disease Severity (%) 18 DAA	Disease Severity (%) 32 DAA	Disease Incidence (0-1) 18 DAA	Disease Incidence (0-1) 32 DAA	100 Seed Weight (g)	Pick (%)	Yield (kg/ha)	Yield-Pick (kg/ha)
1	Untreated Control	--		13.0 a	45.1 a	0.9 a	1.0 a	31.3 a	5.2 e	1940 f	1839 f
2	Lance	540	AB	7.1 a	9.8 b	0.8 a	1.0 a	31.7 a	7.7 ab	2958 ab	2731 ab
3	Allegro	300	AB	10.8 a	12.0 b	0.8 a	1.0 a	31.9 a	7.9 ab	2510 de	2312 cde
4	Allegro	500	A	6.3 a	14.3 b	0.7 a	1.0 a	31.6 a	6.5 b-e	2690 a-e	2516 a-e
5	Allegro	500	AB	4.5 a	7.5 b	0.6 a	1.0 a	32.4 a	7.3 a-d	2823 a-d	2615 a-d
6	Propulse	200	AB	6.6 a	7.6 b	0.9 a	0.9 a	32.9 a	6.8 a-e	2662 a-e	2481 a-e
7	Propulse	300	A	8.0 a	13.5 b	0.8 a	1.0 a	31.1 a	6.6 b-e	2607 b-e	2435 b-e
8	Propulse	300	AB	6.5 a	9.3 b	0.7 a	1.0 a	32.8 a	6.9 a-e	3044 a	2832 a
9	Acapela	220	AB	8.8 a	11.1 b	0.8 a	1.0 a	32.2 a	5.7 cde	2550 cde	2404 b-e
10	Priaxor + Lance	150+392	AB	5.1 a	9.0 b	0.8 a	1.0 a	32.3 a	7.5 abc	2902 abc	2684 abc
11	Fludioxonil	250	AB	6.6 a	15.1 b	0.8 a	1.0 a	31.8 a	8.1 ab	2362 e	2173 ef
12	Circobin	1210	AB	6.8 a	11.4 b	0.7 a	0.9 a	31.9 a	6.1 b-e	2726 a-e	2560 a-d
13	Circobin	1575	AB	6.0 a	7.1 b	0.9 a	0.9 a	32.3 a	8.5 a	2810 a-d	2572 a-d
14	Cotegra	400	AB	6.4 a	10.4 b	0.7 a	1.0 a	32.0 a	7.9 ab	2861 a-d	2637 a-d
15	Delaro	186.2	AB	5.6 a	14.8 b	0.7 a	1.0 a	31.5 a	5.5 de	2406 e	2275 de
Mean				7.2	13.2	0.8	1.0	32.0	7.0	2657	2471
LSD (P=.05)				7.1	8.7	0.3	0.1	1.7	1.9	392	373
CV				68.5	46.3	22.3	9.2	3.7	19.5	10.3	10.6
Treatment Prob(F)				0.6706	0.0001	0.4017	0.6508	0.7161	0.0226	0.0002	0.0006

Means followed by same letter do not significantly differ (P=.05, LSD)

Planted: June 14 6 rows @ 38 cm and 6 meter length.
Harvested: September 19 4 rows @ 38 cm and 4 meter length.
Design: RCBD with 4 replications.
Inocculum: White mold innoculum applied foliarly

Trt Application 1: July 27 7:30 AM, temp=15.6 C, RH=95%, Wind=1.6 kph SW, dew, soil wet
Trt Application 2: August 10 7:30 AM, temp=16.7 C, RH=98%, Wind=0 kph, dew, soil wet
Herbicide : Pursuit @ 200 ml/ha Dual 2 Magnum @ 1.7 L/ha (May 27)
Irrigation: July 12, 20, August 3, 5, 14, 31 and September 5

Conclusions:

*no phytotoxicity was measured from fungicide application
* disease severity in the untreated control was moderate, compared to past work.
* fungicide treatments did not differ for white mold incidence or white mold severity
* all fungicide treatments had higher yield than the untreated control
* Propulse (trt 8) had the highest yield, which was similar to Lance, Allegro (trt. 5), Priaxor + Lance, Circobin and Cotegra
* Allegro (trt. 3), Acapela, Fludioxonil and Delaro had the lowest yield, but were higher than the untreated control

2018 Foliar Fungicide in Dry Beans - White Mold Control Late Planting

University of Guelph, Huron Research Station

Trt. No.	Treatment Name	Rate (g ai/ha)	Timing	Disease Severity (%) 3 DAA	Disease Severity (%) 14 DAA	Disease Severity (%) 36 DAA	Disease Incidence (0-1) 3 DAA	Disease Incidence (0-1) 14 DAA	Disease Incidence (0-1) 36 DAA	100 Seed Weight (g)	Pick (%)	Yield (kg/ha)	Yield-Pick (kg/ha)
1	Untreated Control	--		4.5 a	28.0 a	55.4 a	0.6 a	1.0 a	1.0 a	31.1 e	23.5 c-f	1889 ef	1446 ef
2	Lance	540	AB	1.3 bcd	11.4 bcd	14.1 bc	0.3 b-e	0.9 ab	1.0 a	31.4 de	19.1 f	2374 a-d	1918 ab
3	Allegro	300	AB	2.0 bc	14.1 bc	20.3 b	0.4 abc	1.0 a	1.0 a	31.3 de	27.3 bc	1844 f	1340 ef
4	Allegro	500	A	0.4 cd	7.3 d	15.6 bc	0.1 de	0.8 c	1.0 a	32.1 b-e	25.0 cde	2520 ab	1887 abc
5	Allegro	500	AB	1.6 bcd	15.1 b	16.8 bc	0.3 bcd	1.0 a	1.0 a	32.1 b-e	33.4 a	1873 f	1251 f
6	Propulse	200	AB	1.8 bcd	12.4 bcd	18.8 bc	0.4 abc	1.0 a	1.0 a	32.7 a-d	21.8 def	2271 a-e	1775 a-d
7	Propulse	300	A	0.1 d	8.5 cd	9.4 c	0.0 e	0.9 bc	1.0 a	33.2 abc	21.1 ef	2437 abc	1923 ab
8	Propulse	300	AB	1.1 bcd	8.1 cd	14.1 bc	0.2 b-e	0.9 ab	1.0 a	32.6 a-e	21.0 ef	2640 a	2087 a
9	Acapela	220	AB	2.8 b	13.4 bcd	20.4 b	0.5 ab	1.0 ab	1.0 a	33.4 ab	23.7 c-f	2103 c-f	1606 b-e
10	Priaxor + Lance	150+392	AB	2.8 b	13.8 bc	21.0 b	0.5 ab	1.0 a	1.0 a	31.8 cde	19.4 f	2322 a-d	1869 abc
11	Fludioxonil	250	AB	0.8 cd	13.0 bcd	16.0 bc	0.2 cde	0.9 ab	1.0 a	31.1 e	20.0 f	2001 def	1609 b-e
12	Circobin	1210	AB	1.9 bc	10.4 bcd	18.0 bc	0.4 abc	1.0 a	1.0 a	32.7 a-d	25.2 cde	2635 a	1975 a
13	Circobin	1575	AB	1.1 bcd	13.0 bcd	15.1 bc	0.2 b-e	1.0 ab	1.0 a	33.6 a	30.2 ab	2187 b-f	1527 def
14	Cotegra	400	AB	1.6 bcd	12.0 bcd	15.0 bc	0.3 bcd	1.0 a	1.0 a	33.2 abc	19.0 f	2488 abc	2012 a
15	Delaro	186.2	AB	1.4 bcd	12.9 bcd	17.5 bc	0.2 b-e	1.0 ab	1.0 a	33.0 abc	26.0 bcd	2132 b-f	1581 cde
Mean				1.7	12.9	19.2	0.3	1.0	1.0	32.4	23.7	2248	1720
LSD (P=.05)				1.7	6.3	9.9	0.3	0.1	0.0	1.5	4.7	395	328
CV				70.1	34.4	36.3	64.1	8.4	1.3	3.3	14.0	12.3	13.4
Treatment Prob(F)				0.0010	0.0001	0.0001	0.0081	0.0303	0.4724	0.0091	0.0001	0.0004	0.0001

Means followed by same letter do not significantly differ (P=.05, LSD)

Planted: June 29 6 rows @ 38 cm and 6 meter length.
Harvested: October 16 4 rows @ 38 cm and 4 meter length.
Design: RCBD with 4 replications.
Inocculum: White mold innoculum applied foliarly

Trt Application 1: August 12 8:00 AM, temp=16.2 C, RH=95%, Wind=0.5 kph N, dew, soil slightly wet
Trt Application 2: August 28 7:00 AM, temp=23 C, RH=89%, Wind=8.9 kph W, dew, soil wet
Herbicide : Pursuit @ 200 ml/ha Dual 2 Magnum @ 1.7 L/ha (June 2)
Irrigation: July 12 August 3, 13, 31 and September 5

Conclusions:

*no phytotoxicity was measured from fungicide application
* disease severity in the untreated control was moderately high, compared to past work.
* fungicide treatments did not differ for white mold incidence or white mold severity
* all fungicide treatments had higher yield than the untreated control
* Propulse (trt 8) had the highest yield, which was similar to Lance, Allegro (trt. 5), Priaxor + Lance, Circobin and Cotegra
* Allegro (trt. 3), Acapela, Fludioxonil and Delaro had the lowest yield, but were higher than the untreated control

2018 White Mold Registered Products Soybean Early Planting

University of Guelph, Huron Research Station

Trt No.	Treatment Name	Rate (L/ha)	Appl Code	Disease Severity 77 DAA	Disease Incidence 77 DAA	Seed Weight (g/100)	Seed Quality (1-5; 1=good)	Yield (kg/ha)	Yield (bu/ac)
1	Untreated Control			2.8 a	0.5 a	25.1 a	1.9 a	5876 a	87.4 a
2	Acapela	0.88	A	2.4 ab	0.4 ab	25.6 a	1.6 a	5655 a	84.1 a
3	Allegro	0.44	AB	2.4 ab	0.4 ab	25.2 a	1.9 a	5965 a	88.7 a
4	Stratego Pro	0.5714	A	1.0 bc	0.2 bc	25.2 a	1.6 a	5972 a	88.8 a
5	Stratego Pro	0.5714	AB	1.0 bc	0.2 bc	24.7 a	1.8 a	6037 a	89.8 a
6	Cotegra	0.7	A	2.1 ab	0.3 abc	25.4 a	1.9 a	5932 a	88.2 a
7	Cotegra	0.7	AB	2.3 ab	0.4 a	26.1 a	1.6 a	5859 a	87.1 a
8	Priaxor (A) + Cotegra (B)	0.45+0.7	A/B	1.3 bc	0.2 bc	25.2 a	1.8 a	5521 a	82.1 a
9	Cotegra (A) + Priaxor (B)	0.7+0.45	A/B	0.6 c	0.1 c	26.0 a	1.8 a	5867 a	87.2 a
LSD (P=.05)				1.4	0.2	1.5	0.4	652	9.7
CV				55.4	54.8	3.9	14.6	7.6	7.6
Treatment Prob(F)				0.0355	0.0315	0.6120	0.6748	0.8105	0.8103

Means followed by same letter do not significantly differ (P=.05, LSD)

Trial Summary

Design: RCBD with 4 replications
Cultivar: S18-C2
Planted: May 28 6 rows @ 38 cm and 6 meter length
Harvested: October 9 4 rows @and 4 meter length
Seeding Rate: 21 seeds/m
Inocculum: White mold innoculum applied foliarly

Trt Application #1: July 18 10:00 AM, temp=20.3 C, RH=68%, Wind=2.7 kph SE, dew, soil slightly wet
Trt Application #2: July 31 7:00 AM, temp=20.9 C, RH=85%, Wind=6.7 kph SE, dew, soil slightly wet
Treatment Application: First application at R1.5, second application 13 days later
Herbicide : Pursuit @ 170 ml/ha Dual II Magnum @ 1.7 L/ha May 27
Herbicide : Roundup @ 1.67 l/ha June 29
Irrigation: July 12, 20, August 3, 5, 14, 31 and September 5

Conclusions:

* no phytotoxicity was measured from fungicide treatments
* disease severity in the untreated check was very low
* slight differences between fungicide treatments for white mold incidence and severity
* no differences in seed weight, seed quality or yield

2018 White Mold Registered Products Soybean Late Planting

University of Guelph, Huron Research Station

Trt No.	Treatment Name	Rate (L/ha)	Appl Code	Disease Severity 59 DAA	Disease Severity 78 DAA	Disease Incidence 59 DAA	Disease Incidence 78 DAA	Seed Weight (g/100)	Seed Quality (1-5; 1=good)	Yield (kg/ha)	Yield (bu/ac)
1	Untreated Control			1.3 a	15.9 a	0.2 a	1.0 a	23.1 c	1.9 a	4075 a	60.6 a
2	Acapela	0.88	A	0.3 a	9.8 b	0.1 a	0.9 a	24.7 a	2.0 a	4335 a	64.5 a
3	Allegro	0.44	AB	0.1 a	7.3 b	0.0 a	0.7 a	24.3 ab	1.6 a	4234 a	63.0 a
4	Stratego Pro	0.5714	A	0.1 a	7.9 b	0.0 a	0.8 a	23.6 bc	2.0 a	4209 a	62.6 a
5	Stratego Pro	0.5714	AB	0.6 a	7.9 b	0.1 a	0.7 a	23.9 abc	1.9 a	4174 a	62.1 a
6	Cotegra	0.7	A	0.8 a	10.5 b	0.2 a	0.9 a	23.9 abc	1.9 a	4118 a	61.2 a
7	Cotegra	0.7	AB	0.6 a	7.4 b	0.1 a	0.9 a	23.7 bc	1.9 a	4372 a	65.0 a
8	Priaxor (A) + Cotegra (B)	0.45+0.7	A/B	0.7 a	6.8 b	0.2 a	0.8 a	24.3 ab	1.8 a	4257 a	63.3 a
9	Cotegra (A) + Priaxor (B)	0.7+0.45	A/B	0.1 a	7.5 b	0.0 a	0.8 a	24.3 ab	1.9 a	4336 a	64.5 a
LSD (0.05)				0.7	4.0	0.1	0.3	0.9	0.4	438	6.5
C.V.				100.3	30.9	96.4	21.3	2.5	12.7	7.1	7.1
Pr>F (0.05)				0.0576	0.0026	0.0772	0.3370	0.0413	0.4897	0.8713	0.8712

Means followed by same letter do not significantly differ (P=.05, LSD)

Trial Summary

Design: RCBD with 4 replications
Cultivar: S18-C2
Planted: June 14 6 rows @ 38 cm and 6 meter length
Harvested: October 30 4 rows @and 4 meter length
Seeding Rate: 21 seeds/m
Inocculum: White mold innoculum applied foliarly

Trt Application #1: August 2 6:30 AM, temp=16.4 C, RH=97%, Wind=0.6 kph S, dew, soil slightly wet
Trt Application #2: August 15 7:00 AM, temp=19.2 C, RH=98%, Wind=0 kph SW, dew, soil slightly wet
Treatment Application: First application at R1.5, second application 13 days later
Herbicide : Pursuit @ 170 ml/ha Bonanza @ 1.5 L/ha June 2
Herbicide : Roundup @ 1.67 l/ha June 29
Irrigation: July 11, August 3, 13, 31 and September 5

Conclusions:

* no phytotoxicity was measured from fungicide treatments
* disease severity in the untreated check was low
* no differences between fungicide treatments for white mold incidence and severity
* no differences in seed quality or yield

2018 Sulphur Fertility in Dry Bean
University of Guelph, Huron Research Station

		Tissue Analysis for Sulphur		Plant Height	Plant Development	Plant Dry Weight	Greenseeker		100 Seed Weight	Seed Quality	Yield
		44 DAP	70 DAP	44 DAP	44 DAP	44 DAP	44 DAP	70 DAP			
Factor A (Market Class)		(%)		(cm)	(BBCH)	(g)	(0-1)		(g/100)	(1-5; 1=good)	(kg/ha)
1 Navy (cv. Mist)		0.24 a	0.19 a	19.8 a	49.1 a	2.4 a	52.0 b	81.2 a	24.0 b	1.4 b	2610 a
2 Black (cv. Zorro)		0.22 a	0.20 a	20.0 a	49.8 a	2.3 a	56.6 a	79.9 a	25.2 a	1.8 a	2204 b
Factor B (Fertilizer)											
1 Control[a]		0.23 a	0.19 a	20.4 a	50.4 a	2.6 a	52.8 a	80.1 a	24.7 a	1.8 b	2342 a
2 Potassium Sulphate		0.23 a	0.20 a	19.5 a	50.2 a	2.3 a	54.3 a	81.1 a	24.5 a	1.4 a	2548 a
3 Ammonium Sulphate		0.24 a	0.20 a	19.6 a	47.5 a	2.3 a	53.4 a	79.1 a	24.3 a	1.5 a	2409 a
4 Ammonium Thiosulphate		0.23 a	0.19 a	20.1 a	49.9 a	2.3 a	56.8 a	81.9 a	24.7 a	1.6 ab	2329 a
Factor A x B											
1 Navy (cv. Mist)	Control	0.22 a	0.19 a	20.9 a	49.7 a	2.8 a	51.3 a	81.8 a	24.0 a	1.8 a	2505 a
2 Navy (cv. Mist)	Potassium Sulphate	0.25 a	0.20 a	19.9 a	51.0 a	2.5 a	51.5 a	80.3 a	24.0 a	1.3 a	2749 a
3 Navy (cv. Mist)	Ammonium Sulphate	0.25 a	0.21 a	18.9 a	47.2 a	2.2 a	49.3 a	79.3 a	24.0 a	1.4 a	2594 a
4 Navy (cv. Mist)	Ammonium Thiosulphate	0.24 a	0.19 a	19.5 a	48.7 a	2.1 a	56.0 a	83.5 a	23.9 a	1.3 a	2591 a
5 Black (cv. Zorro)	Control	0.25 a	0.20 a	19.9 a	51.1 a	2.4 a	54.3 a	78.5 a	25.5 a	1.9 a	2178 a
6 Black (cv. Zorro)	Potassium Sulphate	0.22 a	0.20 a	19.0 a	49.4 a	2.2 a	57.0 a	82.0 a	25.1 a	1.6 a	2347 a
7 Black (cv. Zorro)	Ammonium Sulphate	0.22 a	0.19 a	20.3 a	47.8 a	2.4 a	57.5 a	79.0 a	24.6 a	1.6 a	2224 a
8 Black (cv. Zorro)	Ammonium Thiosulphate	0.22 a	0.19 a	20.7 a	51.0 a	2.5 a	57.5 a	80.3 a	25.4 a	1.9 a	2067 a
Pr>F (A)		0.1290	0.9440	0.8261	0.7170		0.0162	0.3938	0.0001	0.0014	0.0001
Pr>F (B)		0.9320	0.7763	0.8336	0.6623	0.7375	0.4068	0.5656	0.6008	0.0499	0.2778
Pr>F (AB)		0.1092	0.5988	0.6277	0.8923	0.4441	0.5518	0.5470	0.4587	0.3018	0.8643
LSD 0.05 (A)		NS	NS	NS	NS	NS	3.6	NS	0.5	0.2	178
LSD 0.05 (B)		NS	NS	NS	NS	NS	NS	NS	NS	0.3	NS
LSD 0.05 (AB)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

[a] - sulphur fertilizers were applied at 25kg/ha actual S. All treatments were balanced for nitrogen at 50 kg/ha actual N

Trial Summary

Design:Factorial with 4 replications
Planting Date: June 6 4 rows @ 76 cm and 6 meter length
Cultivar: Mist
Harvest Date: September 21 2 rows and 4 meter length
Seeding Rate: 17 seed/m of row

Soil Analysis

	OM (%)	S (ppm)	
Rep	0[b]	0[b]	44[b]
1	3.8	3.4	3.6
2	3.8	5.1	4.0
3	3.8	4.8	3.9
4	3.5	4.0	2.6

[b] - days after planting

Conclusions:
* soil analysis showed good OM and S levels
* all treatments were below the critical tissue S level of 0.25% at 70 days after planting
* the dry bean tissue S levels did not increase with any S fertilizer, when compared to a control treatment
* applying S fertilizer did not impact plant height, plant development or plant dry weight at 44 days after planting
* differences in greenseeker score, 100 seed weight and yield were due to differences in characteristics between the cultivars
* differences in seed quality were not consistent between S fertilizer treatments

2018 Sulphur Fertility in Soybean

University of Guelph, Huron Research Station

		Tissue Analysis for Sulphur		Plant Height	Plant Development	Plant Dry Weight	Greenseeker		100 Seed Weight	Seed Quality	Yield
		44 DAP	70 DAP	44 DAP	44 DAP	44 DAP	44 DAP	70 DAP			
Factor A (Cultivar)		(%)		(cm)	(BBCH)	(g)	(0-1)		(g/100)	(1-5; 1=good)	(kg/ha)
1 S10-S1		0.18 a	0.26 a	35.6 a	58.6 a	4.2 a	73.3 a	91.0 a	21.8 b	2.2 a	4580 a
2 PS1210NLL		0.17 a	0.26 a	33.3 b	54.9 b	3.9 a	67.2 b	89.8 b	25.6 a	1.8 b	4791 a
Factor B (Fertilizer)											
1 Control[a]		0.17 a	0.25 a	33.8 a	56.9 ab	3.8 a	68.5 a	90.4 a	23.5 a	2.2 a	4653 a
2 Potassium Sulphate		0.17 a	0.26 a	36.1 a	58.9 a	4.5 a	71.4 a	90.1 a	24.0 a	1.8 c	4769 a
3 Ammonium Sulphate		0.18 a	0.24 a	34.8 a	54.5 b	4.0 a	72.3 a	90.8 a	23.6 a	1.9 bc	4759 a
4 Ammonium Thiosulphate		0.17 a	0.27 a	33.1 a	56.8 ab	3.8 a	68.8 a	90.3 a	23.8 a	2.0 b	4561 a
Factor A x B											
1 S10-S1	Control	0.17 a	0.28 a	35.3 a	59.3 a	3.9 a	70.0 a	91.0 a	21.8 a	2.4 a	4494 a
2 S10-S1	Potassium Sulphate	0.18 a	0.24 a	36.8 a	60.5 a	4.5 a	74.0 a	90.5 a	21.9 a	2.0 a	4570 a
3 S10-S1	Ammonium Sulphate	0.19 a	0.24 a	36.7 a	54.9 a	4.0 a	75.8 a	91.8 a	21.6 a	2.1 a	4687 a
4 S10-S1	Ammonium Thiosulphate	0.17 a	0.27 a	33.6 a	59.9 a	4.2 a	73.3 a	90.8 a	22.0 a	2.3 a	4568 a
5 PS1210NLL	Control	0.16 a	0.23 a	32.3 a	54.5 a	3.6 a	67.0 a	89.8 a	25.3 a	2.0 a	4811 a
6 PS1210NLL	Potassium Sulphate	0.17 a	0.28 a	35.4 a	57.2 a	4.4 a	68.8 a	89.8 a	26.0 a	1.6 a	4968 a
7 PS1210NLL	Ammonium Sulphate	0.17 a	0.25 a	33.0 a	54.0 a	4.0 a	68.8 a	89.8 a	25.6 a	1.8 a	4830 a
8 PS1210NLL	Ammonium Thiosulphate	0.18 a	0.27 a	32.5 a	53.8 a	3.5 a	64.3 a	89.8 a	25.6 a	1.8 a	4554 a
Pr>F (A)		0.3287	0.8866	0.0090	0.0001	0.2381	0.0010	0.0001	0.0001	0.0001	0.0838
Pr>F (B)		0.4123	0.4712	0.0683	0.0095	0.1295	0.2722	0.2475	0.1922	0.0327	0.5571
Pr>F (AB)		0.7266	0.1077	0.6054	0.1543	0.6883	0.5951	0.2475	0.4838	0.9343	0.6081
LSD 0.05 (A)		NS	NS	1.7	1.7	NS	3.3	0.5	NS	0.2	NS
LSD 0.05 (B)		NS	NS	NS	2.4	NS	NS	NS	NS	0.2	NS
LSD 0.05 (AB)		NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

[a] - sulphur fertilizers were applied at 25kg/ha actual S. All treatments were balanced for nitrogen at 50 kg/ha actual N

Trial Summary

Design:Factorial with 4 replications
Planting Date: June 6 4 rows @ 76 cm and 6 meter length
Cultivar: S10-S1, PS1210NLL
Harvest Date: October 9 2 rows and 5 meter length
Seeding Rate: 20 seed/m of row

Soil Analysis

	OM (%)	S (ppm)	
Rep	0[b]	0[b]	44[b]
1	3.7	8.7	2.4
2	3.7	3.9	1.6
3	3.7	3.3	2.6
4	3.8	1.8	3.0

[b] - days after planting

Conclusions:

* soil analysis showed good OM and S levels
* all treatments were below the critical tissue S level of 0.25% at 44 days after planting
* the soybean cultivar tissue sulphur levels did not increase with any S fertilizer, when compared to a control treatment
* applying S fertilizer did not impact plant height, plant development or plant dry weight at 44 days after planting
* differences in plant development, greenseeker score, 100 seed weight and seed quality were due to differences in characteristics between the cultivars
* differences in seed quality were not consistent between S fertilizer treatments

2018 Fusarium Root Rot Seed Treatment Head-to-Head Dry Bean 1st Planting (10 g/m of row)

University of Guelph, Huron Research Station

Trt No.	Treatment Name	Rate (g ai/100 kg)	Plant Emergence (%)						Plant Vigour						Yield (kg/ha)
			6	8	12	17	28	35	7	8	12	17	28	35	
			days after planting						1-10 (1=worse)						
1	Noninnoculated Control + Cruiser	50	46.0 a	77.1 a	83.5 a	85.0 a	84.8 a	85.6 a	8.7 a	8.8 a	9.5 a	9.7 a	9.8 a	9.8 a	1535 a
2	Innoculated Control + Cruiser	50	8.3 cd	35.6 de	55.8 de	60.0 cd	62.9 de	64.0 de	5.0 e	5.2 d	5.8 e	7.3 ef	7.3 f	7.5 d	1466 a
3	Cruiser MaxxBean	56.25	12.3 bcd	52.7 bc	74.6 abc	74.6 ab	76.5 abc	76.9 abc	6.5 bc	6.8 b	7.3 b	8.2 bc	8.2 bcd	8.5 bc	1605 a
4	Cruiser MaxxBean + Dynasty	56.25+1	5.6 d	48.1 bcd	72.9 bc	78.3 ab	80.4 ab	80.6 ab	5.0 e	5.7 cd	6.8 bcd	7.8 cde	8.3 bc	8.3 bc	1718 a
5	Cruiser MaxxBean + Sedaxane	56.25+5.0	15.0 bcd	53.5 bc	74.0 abc	77.9 ab	80.4 ab	80.0 ab	6.2 bcd	6.5 bc	7.2 bc	7.7 c-f	8.3 bc	8.3 bc	1739 a
6	Cruiser MaxxBean + Dynasty + Sedaxane	56.25+1+5.0	7.5 cd	43.8 cd	68.3 bc	67.1 bc	70.4 cd	70.4 cd	5.3 de	5.7 cd	6.3 de	7.2 f	7.5 ef	7.7 d	1486 a
7	Rancona Summit + Cruiser	4.06+50	16.3 bc	49.6 bc	65.6 cd	67.3 bc	71.3 bcd	72.5 bcd	6.0 bcd	6.5 bc	6.8 bcd	8.0 bcd	8.2 bcd	8.3 bc	1416 a
8	Rancona Summit + Cruiser + Maxim	4.06+50+2.2	19.0 b	54.8 bc	75.4 abc	75.8 ab	77.3 abc	77.7 abc	6.8 b	6.8 b	7.2 bc	8.5 b	8.7 b	8.7 b	1300 a
9	Rancona Summit+Cruiser+Maxim+Sedaxane	4.06+50+2.2+5.0	14.4 bcd	50.0 bc	71.7 bc	72.9 b	74.6 bc	75.4 bc	6.2 bcd	6.7 b	7.2 bc	8.0 bcd	8.2 bcd	8.3 bc	1484 a
10	Rancona Summit+Cruiser+Maxim+Sedaxane+Dynasty	4.06+50+2.2+5.0+1	13.1 bcd	59.4 b	77.7 ab	78.5 ab	80.0 abc	80.0 ab	5.8 cde	6.3 bc	7.2 bc	8.0 bcd	8.3 bc	8.5 bc	1596 a
11	Evergol Energy+Cruiser	11.5+50	8.1 cd	29.2 e	46.3 e	50.8 d	56.7 e	57.1 e	6.0 bcd	6.3 bc	6.5 cde	7.5 def	7.7 def	7.7 d	1316 a
12	Insure Pulse +Cruiser	14+50	11.5 bcd	52.1 bc	70.6 bc	71.0 bc	74.2 bc	75.2 bc	5.7 cde	6.2 bc	7.3 b	8.0 bcd	8.0 cde	8.0 cd	1638 a
LSD (P=.05)			9.5	12.9	10.4	11.5	9.9	9.4	1.0	0.9	0.8	0.6	0.7	0.7	--
CV			55.8	22.1	12.9	13.9	11.6	10.9	13.6	11.4	9.3	6.2	7.0	6.9	21.3
Treatment Prob(F)			0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.3480

Planted: May 25 2 rows @ 76 cm and 2 meter length.
Harvested: September 5 2 rows @ 76 cm and 2 meter length.
Design: RCBD with 4 replications.
Inoculum: Fusarium solani applied in the seed furrow at planting, at a rate of 10 grams per meter of row
Herbicide : Pursuit+Dual Magnum II+Roundup 0.2+1.7+2.5L/ha (May 24); Assure II 0.61 l/ha (July 4); Reflex 1 l/ha (July 5); Eragon+Merge 0.15+0.4L/ha (August 30)
Insecticide: Matador @ 83 ml/ha (July 4 and July 19)
Fungicide: Headline 0.4 l/ha (July 19)

Conclusions:
* differences in emergence and vigour between the two control trts were measured for 35 days after planting, suggesting that the innoculum gave some disease pressure
* the addition of Dynasty to Cruiser Maxx Bean treatments (trt. 4 vs 3 and trt. 6 vs 5) resulted in a reduction in plant emergence and plant vigour
* the addition of Dynasty to Rancona Summit treatments (trt. 10 vs 9) did not affect plant emergence and plant vigour
* the top seed treatments had similar plant emergence as the non-inoculated control at 17 days after planting.
* the top seed treatments had lower plant vigour than the non-inoculated control for 35 days after planting
* the top seed treatment was Cruiser Maxx Bean + Dynasty. The addition of Rancona Summit did not measureably increase plant emergence.
* the top seed treatment for plant vigour was Rancona Summit + Cruiser + Maxim. The addition of Dynasty resulted in a reduction in plant vigour at times.
* Evergol Energy was the weakest treatment for plant emergence, and had some of the lowest plant vigour scores.
* Insure Pulse was similar to the top treatments for plant emergence and plant vigour
* the seed treatment differences for plant emergence and plant vigour did not result in differences in yield at harvest.

2018 Fusarium Root Rot Seed Treatment Head-to-Head Dry Bean 2nd Planting (20 g/m of row)
University of Guelph, Huron Research Station

Trt	Treatment	Rate	Plant Emergence (%)						Plant Vigour						Yield
			6	8	12	17	28	35	7	8	12	17	28	35	
No.	Name	(g ai/100 kg)	days after planting						1-10 (1=worse)						(kg/ha)
1	Noninnoculated Control + Cruiser	50	51.5 a	84.0 a	88.1 a	90.0 a	91.0 a	91.3 a	8.8 a	9.0 a	9.0 a	9.8 a	10.0 a	10.0 a	1335 bcd
2	Innoculated Control + Cruiser	50	1.5 bc	11.9 de	28.8 f	39.6 f	44.0 d	44.8 e	6.0 b	4.3 de	5.7 d	6.3 c	6.8 d	7.2 d	1203 d
3	Cruiser MaxxBean	56.25	1.5 bc	19.6 cde	47.3 bcd	57.7 cde	63.8 bc	64.8 bcd	5.3 bcd	5.3 b-e	6.3 bcd	7.2 b	7.3 bcd	7.3 cd	1622 abc
4	Cruiser MaxxBean + Dynasty	56.25+1	1.5 bc	29.0 b	57.9 b	70.2 b	72.3 b	73.8 b	5.7 bc	5.3 b-e	6.7 b	7.2 b	7.8 b	7.8 bc	1809 a
5	Cruiser MaxxBean + Sedaxane	56.25+5.0	0.4 c	20.2 cd	43.5 cd	55.8 de	63.1 bc	63.3 cd	4.2 d	4.7 cde	6.0 bcd	7.0 b	7.3 bcd	7.8 bc	1630 abc
6	Cruiser MaxxBean + Dynasty + Sedaxane	56.25+1+5.0	1.3 bc	20.2 cd	51.0 bcd	61.9 bcd	69.4 b	69.6 bc	4.0 d	4.2 e	5.8 cd	7.0 b	7.5 bc	7.5 bcd	1809 a
7	Rancona Summit + Cruiser	4.06+50	4.6 b	23.1 bc	40.2 de	49.0 ef	56.5 c	56.5 d	5.7 bc	5.7 bcd	6.3 bcd	7.0 b	7.3 bcd	7.5 bcd	1487 a-d
8	Rancona Summit + Cruiser + Maxim	4.06+50+2.2	3.8 bc	26.7 bc	50.6 bcd	63.8 bcd	70.0 b	70.8 bc	6.0 b	6.2 b	6.5 bc	7.0 b	7.8 b	8.0 b	1807 a
9	Rancona Summit+Cruiser+Maxim+Sedaxane	4.06+50+2.2+5.0	2.1 bc	20.8 bc	46.0 cd	56.0 de	64.4 bc	65.4 bcd	5.0 bcd	5.5 b-e	6.2 bcd	7.0 b	7.7 b	7.7 bcd	1700 ab
10	Rancona Summit+Cruiser+Maxim+Sedaxane+Dynasty	4.06+50+2.2+5.0+1	1.5 bc	22.7 bc	50.2 bcd	59.6 b-e	66.0 bc	66.5 bc	4.5 cd	4.3 de	5.7 d	6.8 b	7.3 bcd	7.3 cd	1452 a-d
11	Evergol Energy+Cruiser	11.5+50	0.8 bc	11.7 e	31.3 ef	42.9 f	44.0 d	44.8 e	5.3 bcd	5.2 b-e	6.0 bcd	6.8 b	7.0 cd	7.3 cd	1243 cd
12	Insure Pulse +Cruiser	14+50	3.3 bc	26.3 bc	54.6 bc	68.3 bc	71.5 b	71.7 bc	6.3 b	5.8 bc	6.2 bcd	6.8 b	7.3 bcd	7.5 bcd	1622 abc
LSD (P=.05)			4.0	8.5	11.1	11.4	9.9	9.6	1.5	1.4	0.8	0.5	0.6	0.6	387.6
CV			57.0	27.9	19.5	16.6	13.2	12.7	22.5	21.6	11.3	5.8	6.7	7.2	21.5
Treatment Prob(F)			0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0135

Planted: May 25 2 rows @ 76 cm and 2 meter length.
Harvested: September 14 2 rows @ 76 cm and 2 meter length.
Design: RCBD with 4 replications.
Inoculum: Fusarium solani applied in the seed furrow at planting, at a rate of 20 grams per meter of row
Herbicide : Pursuit+Dual Magnum II+Roundup 0.2+1.7+2.5L/ha (May 24); Assure II 0.61 l/ha (July 4); Reflex 1 l/ha (July 5); Eragon+Merge 0.15+0.4L/ha (August 30)
Insecticide: Matador @ 83 ml/ha (July 4 and July 19)
Fungicide: Headline 0.4 l/ha (July 19)

Conclusions:
* differences in emergence and vigour between the two control trts were measured for 35 days after planting, suggesting that the innoculum gave some disease pressure
* adding Dynasty to Cruiser Maxx Bean treatments (trt. 4 vs 3) resulted in an increase in plant emergence and plant vigour. Similar results were not observed when Sedaxane + Dynasty were added to Cruiser Maxx Bean (trt. 6 vs 3)
* the addition of Sedaxane to Cruiser Maxx Bean treatments (trt. 5 vs 3) did not impact plant emergence and plant vigour
* the addition of Dynasty to Rancona Summit treatments (trt. 10 vs 9) reduced plant vigour but did not affect plant emergence
* the top seed treatments had lower plant emergence and plant vigour than the non-inoculated control for 35 days after planting
* top treatments for emergence were Cruiser Maxx Bean + Dynasty, Rancona Summit + Cruiser + Maxim and Insure Pulse + Cruiser. Adding Rancona Summit to Crusier Maxx Bean did not measureably increase plant emergence.
* the top seed treatments for plant vigour were Cruiser Maxx Bean + Dynasty, Rancona Summit + Cruiser + Maxim and Insure Pulse + Cruiser.
* Evergol Energy was the weakest treatment for plant emergence and plant vigour, with similar scores to the inoculated control.
* Insure Pulse was similar to the top treatments for plant emergence and plant vigour
* Cruiser Maxx Bean + Dynasty and Rancona Summit + Cruiser + Maxim had the highest yield at harvest.
* The addition of Dynasty resulted in a consistent yield increase with Cruiser Maxx Bean but not with Rancona Summit
* Evergol Energy had the lowest yield of any seed treatment
* Insure Pulse increased yield compared to the non-inoculated control

2018 Rhizoctonia Root Rot Seed Treatment Head-to-Head Dry Bean 1st Planting (5 g/m of row)

University of Guelph, Huron Research Station

Trt	Treatment	Rate	Plant Emergence (%)						Plant Vigour						Yield
			6	8	12	17	28	35	7	8	12	17	28	35	
No.	Name	(g ai/100 kg)	days after planting						1-10 (1=worse)						(kg/ha)
1	Noninnoculated Control + Cruiser	50	48.1 a	78.5 a	85.4 a	86.3 a	87.3 a	87.3 a	9.0 a	9.0 a	9.7 a	9.8 a	9.8 a	9.8 a	1448 a
2	Innoculated Control + Cruiser	50	14.4 def	49.4 ef	60.4 d	63.3 c	64.6 d	64.8 c	6.5 cde	6.7 c-f	7.2 bc	7.7 cd	7.8 cd	7.8 d	1258 a
3	Cruiser MaxxBean	56.25	20.0 bcd	59.4 b-f	79.0 abc	82.1 ab	81.7 abc	82.1 ab	7.3 b	7.3 bc	7.8 b	8.3 b	8.3 bc	8.5 bc	1496 a
4	Cruiser MaxxBean + Dynasty	56.25+1	16.0 c-f	53.5 c-f	72.3 bc	76.7 ab	77.1 bc	77.7 b	6.3 cde	6.5 def	7.3 bc	8.3 b	8.3 bc	8.5 bc	1333 a
5	Cruiser MaxxBean + Sedaxane	56.25+5.0	11.3 ef	50.2 def	68.8 cd	76.3 ab	79.0 bc	79.6 b	6.2 de	6.0 f	6.8 c	7.7 cd	7.7 d	7.7 d	1555 a
6	Cruiser MaxxBean + Dynasty + Sedaxane	56.25+1+5.0	9.6 f	48.3 f	69.6 cd	75.2 b	79.0 bc	79.8 b	5.8 e	6.2 ef	6.8 c	7.3 d	7.5 d	7.7 d	1694 a
7	Rancona Summit + Cruiser	4.06+50	23.8 bc	61.7 bcd	74.0 bc	76.3 ab	77.3 bc	77.3 b	6.5 cde	7.0 bcd	7.7 bc	8.2 bc	8.5 b	8.7 b	1535 a
8	Rancona Summit + Cruiser + Maxim	4.06+50+2.2	20.0 bcd	60.8 b-e	74.4 bc	78.8 ab	79.8 abc	80.0 b	7.3 b	7.2 bcd	7.7 bc	8.5 b	8.5 b	8.5 bc	1450 a
9	Rancona Summit+Cruiser+Maxim+Sedaxane	4.06+50+2.2+5.0	25.0 b	69.2 ab	82.1 ab	82.9 ab	83.1 ab	82.9 ab	6.7 bcd	7.3 bc	8.0 b	8.5 b	8.7 b	8.7 b	1492 a
10	Rancona Summit+Cruiser+Maxim+Sedaxane+Dynasty	4.06+50+2.2+5.0+1	14.2 def	57.1 b-f	70.8 c	73.1 bc	73.8 c	76.7 b	6.3 cde	6.7 c-f	7.3 bc	8.0 bc	7.8 cd	7.8 d	1412 a
11	Evergol Energy+Cruiser	11.5+50	24.4 bc	62.7 bc	74.0 bc	76.9 ab	79.2 bc	82.3 ab	7.0 bc	7.5 b	8.0 b	8.2 bc	8.3 bc	8.5 bc	1389 a
12	Insure Pulse +Cruiser	14+50	18.3 b-e	55.2 c-f	72.3 bc	74.8 b	76.9 bc	78.1 b	6.8 bcd	6.8 b-e	7.5 bc	7.7 cd	7.7 d	8.0 cd	1452 a
LSD (P=.05)			8.7	12.3	10.3	10.2	8.1	6.7	0.7	0.7	0.9	0.6	0.6	0.7	--
CV			36.9	18.0	12.1	11.4	9.0	7.3	9.0	8.8	10.0	6.7	6.7	6.8	18.6
Treatment Prob(F)			0.0001	0.0002	0.0021	0.0113	0.0006	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.4494

Planted: May 25 2 rows @ 76 cm and 2 meter length.
Harvested: September 14 2 rows @ 76 cm and 2 meter length.
Design: RCBD with 4 replications.
Inoculum: Rhizoctonia solani applied in the seed furrow at planting, at a rate of 5 grams per meter of row
Herbicide : Pursuit+Dual Magnum II+Roundup 0.2+1.7+2.5L/ha (May 24); Assure II 0.61 l/ha (July 4); Reflex 1 l/ha (July 5); Eragon+Merge 0.15+0.4L/ha (August 30)
Insecticide: Matador @ 83 ml/ha (July 4 and July 19)
Fungicide: Headline 0.4 l/ha (July 19)

Conclusions:
* differences in emergence and vigour between the two control trts were measured for 35 days after planting, suggesting that the innoculum gave some disease pressure
* the addition of Dynasty to Cruiser Maxx Bean treatments (trt. 4 vs 3) resulted in a reduction in plant emergence and plant vigour
* the addition of Sedaxane to Cruiser Maxx Bean treatments (trt. 5 vs 3) resulted in a reduction in plant emergence and plant vigour that was greater than the impact of adding Dynasty to Cruiser Maxx Bean
* the addition of Sedaxane to Rancona Summit + Cruiser + Maxim treatments (trt. 9 vs 8) increased plant emergence but did not impact plant vigour
* the top seed treatment for plant emergence and plant vigour was Rancona Summit + Cruiser + Maxim + Sedaxane, which was consistently better than the inoculated control for all rating dates.
* Evergol Energy was similar to the top seed treatment for all rating dates.
* Insure Pulse gave aveage results for plant emergence and plant vigour
* the seed treatment differences for plant emergence and plant vigour did not result in differences in yield at harvest.

2018 Rhizoctonia Root Rot Seed Treatment Head-to-Head Dry Bean 2nd Planting (10 g/m of row)

University of Guelph, Huron Research Station

Trt No.	Treatment Name	Rate (g ai/100 kg)	Plant Emergence (%) days after planting						Plant Vigour 1-10 (1=worse)						Yield (kg/ha)
			6	8	12	17	28	35	7	8	12	17	28	35	
1	Noninnoculated Control + Cruiser	50	35.0 a	66.5 a	78.5 a	81.5 a	85.0 a	85.2 a	8.5 a	8.7 a	9.0 a	9.0 a	9.2 a	9.2 a	1942 a
2	Innoculated Control + Cruiser	50	3.8 c	22.5 c	38.3 c	43.5 c	46.5 f	47.3 e	4.8 e	5.7 e	6.5 d	6.7 d	6.8 d	7.0 c	1474 a
3	Cruiser MaxxBean	56.25	7.7 bc	37.7 b	55.8 b	59.8 b	63.3 de	64.8 d	6.3 bcd	6.5 bcd	7.0 bcd	7.0 bcd	7.7 bc	7.7 bc	1614 a
4	Cruiser MaxxBean + Dynasty	56.25+1	5.0 c	35.4 b	56.7 b	64.0 b	68.5 b-e	70.2 bcd	5.7 cde	6.3 cde	7.2 bc	7.2 bcd	7.3 bcd	7.7 bc	1603 a
5	Cruiser MaxxBean + Sedaxane	56.25+5.0	4.2 c	34.2 bc	56.9 b	64.2 b	69.0 b-e	69.4 bcd	5.5 de	6.0 de	7.0 bcd	7.0 bcd	7.5 bc	7.5 bc	1858 a
6	Cruiser MaxxBean + Dynasty + Sedaxane	56.25+1+5.0	5.6 c	41.5 b	60.8 b	66.0 b	69.6 b-e	64.8 d	6.0 bcd	6.2 cde	7.3 b	7.3 bc	7.5 bc	7.5 bc	1492 a
7	Rancona Summit + Cruiser	4.06+50	8.3 bc	37.7 b	54.4 b	58.5 b	64.6 cde	65.8 cd	6.0 bcd	6.7 bcd	7.2 bc	7.5 b	7.7 bc	7.8 b	1744 a
8	Rancona Summit + Cruiser + Maxim	4.06+50+2.2	9.6 bc	43.1 b	63.1 b	68.1 b	75.2 b	77.9 ab	6.7 b	7.2 b	7.3 b	7.3 bc	7.8 b	8.0 b	1623 a
9	Rancona Summit+Cruiser+Maxim+Sedaxane	4.06+50+2.2+5.0	6.7 c	36.3 b	57.5 b	63.5 b	70.2 b-e	73.8 bc	6.5 bc	6.5 bcd	7.0 bcd	7.0 bcd	7.2 cd	7.3 bc	1710 a
10	Rancona Summit+Cruiser+Maxim+Sedaxane+Dynasty	4.06+50+2.2+5.0+1	6.0 c	37.5 b	55.4 b	57.9 b	62.9 e	65.6 cd	6.0 bcd	6.0 de	6.7 cd	6.8 cd	7.5 bc	7.5 bc	1917 a
11	Evergol Energy+Cruiser	11.5+50	13.1 b	45.4 b	61.3 b	66.0 b	71.0 bcd	76.0 b	6.7 b	6.8 bc	7.5 b	7.5 b	7.8 b	8.0 b	1608 a
12	Insure Pulse +Cruiser	14+50	13.5 b	45.4 b	64.8 b	65.8 b	71.5 bc	74.8 b	6.5 bc	6.5 bcd	6.7 cd	6.8 cd	7.5 bc	7.5 bc	1630 a
LSD (P=.05)			6.2	12.4	12.2	10.2	8.0	8.6	1.0	0.8	0.6	0.6	0.6	0.7	--
CV			54.3	26.6	18.0	14.0	10.2	10.7	13.2	10.3	6.9	6.8	7.2	7.9	25.9
Treatment Prob(F)			0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.6906

Planted: May 25 2 rows @ 76 cm and 2 meter length.
Harvested: September 14 2 rows @ 76 cm and 2 meter length.
Design: RCBD with 4 replications.
Inoculum: Rhizoctonia solani applied in the seed furrow at planting, at a rate of 10 grams per meter of row
Herbicide : Pursuit+Dual Magnum II+Roundup 0.2+1.7+2.5L/ha (May 24); Assure II 0.61 l/ha (July 4); Reflex 1 l/ha (July 5); Eragon+Merge 0.15+0.4L/ha (August 30)
Insecticide: Matador @ 83 ml/ha (July 4 and July 19)
Fungicide: Headline 0.4 l/ha (July 19)

Conclusions:
* differences in emergence and vigour between the two control trts were measured for 35 days after planting, suggesting that the innoculum gave some disease pressure
* the addition of Dynasty otSedaxane to Cruiser Maxx Bean treatments (trt. 4 vs 3 and trt. 5 vs 3) did not improve plant emergence or plant vigour
* the addition of Sedaxane to Rancona Summit + Cruiser + Maxim treatments (trt. 9 vs 8) did not improve plant emergence or plant vigour.
* the addition of Sedaxane + Dynasty to Rancona Summit + Cruiser + Maxim treatments (trt. 10 vs 8) reduced plant emergence and plant vigour.
* the top seed treatment for plant emergence and plant vigour was Rancona Summit + Cruiser + Maxim.
* Evergol Energy was similar to the top seed treatment for all rating dates.
* Insure Pulse gave aveage results for plant emergence and plant vigour
* the seed treatment differences for plant emergence and plant vigour did not result in differences in yield at harvest.

2018 Soybean Variety Performance Conventional - Exeter

Trt No.	Treatment Name	Yield kg/ha	Yield bu/ac	Rank	Seed Quality (1-5)	Days to Maturity	Lodging Score	Plant Height (cm)
1	DH530	3484	51.8	46	2.0	125	1.5	96
2	HDC 1600T	3675	54.6	37	2.2	131	1.0	92
3	Black Pearl	3203	47.6	62	2.5	118	1.0	97
4	HDC Goshen	4428	65.8	9	1.5	127	1.8	100
5	Acora	3067	45.6	68	2.3	126	1.0	88
6	OAC Calypso	3450	51.3	48	2.0	135	1.5	97
7	HDC Blake	3468	51.6	47	1.8	134	1.2	101
8	Candor	4166	62.0	16	1.5	129	1.2	94
9	OAC Avatar	3972	59.1	22	1.5	124	1.3	96
10	Bakara	3381	50.3	55	2.2	125	1.0	98
11	DH4202	3936	58.5	24	2.5	129	1.2	100
12	DH4173	3425	50.9	51	1.7	122	1.0	101
13	LC1070	3603	53.6	41	2.5	128	1.0	98
14	Kyoto	3188	47.4	64	2.7	117	1.0	76
15	Eider	3360	50.0	56	2.3	123	1.2	91
16	Havane	3330	49.5	58	2.5	121	1.2	84
17	Neptune	3282	48.8	59	2.7	120	1.0	84
18	S16-F5	4833	71.9	3	2.0	128	1.0	97
19	Karra	3389	50.4	54	1.7	119	1.0	85
20	OAC Prosper	4306	64.0	12	2.0	130	2.2	95
21	OAC Adare	3426	51.0	50	1.7	133	1.0	105
22	Genesis	3554	52.8	45	2.0	128	1.0	91
23	Skyline	3912	58.2	25	1.5	122	1.7	97
24	SVX14T1G1	3824	56.9	28	2.3	131	2.5	124
25	S14-H3	4519	67.2	5	1.8	120	1.0	88
26	Nordika	3136	46.6	66	3.0	115	1.0	88
27	Arius	2910	43.3	71	2.0	129	1.0	98
28	Osaka	3710	55.2	36	2.0	119	1.0	76
29	OAC 13-87C-SCN	5123	76.2	1	2.0	125	1.3	104
30	Nagoya	3399	50.5	53	2.0	117	1.0	79
31	S10-R2	4117	61.2	18	1.5	116	1.8	88
32	OAC 13-50C-ZL	3350	49.8	57	2.3	127	1.5	94
33	OAC 14-37C-SCN	3849	57.2	27	2.0	124	1.7	98
34	OAC 14-39C-SCN	3804	56.6	29	1.7	129	1.3	98
35	SVX16T1S2	3576	53.2	44	1.7	128	1.0	98
36	Zana	4047	60.2	21	1.5	127	1.2	109
37	SeCan 15-29C SCN	4179	62.1	15	1.8	125	1.8	104
38	OAC 15-32C	2986	44.4	70	1.8	125	1.0	86

39	OAC 15-33C	3032	45.1	69	2.0	121	1.2	94
40	DS101C0	3734	55.5	32	1.5	119	1.0	91
41	SeCan 16-25C	3196	47.5	63	1.8	125	1.2	93
42	SeCan 16-26C	3156	46.9	65	2.0	130	1.3	95
43	SVX17T2S1	3758	55.9	31	2.0	127	1.0	90
44	OAC 16-27C-Tof	2793	41.5	72	2.3	128	1.3	90
45	Tala	3244	48.2	61	2.0	122	1.7	93
46	P11A67	3723	55.4	34	1.8	125	1.0	96
47	P11A10	4315	64.2	11	2.2	126	1.7	98
48	Azalea	4682	69.6	4	1.7	128	1.8	96
49	P14A23L	4444	66.1	7	2.0	130	1.2	111
50	CFS18.4.03	4124	61.3	17	1.5	132	2.3	107
51	CFS18.62	3117	46.4	67	1.8	131	1.0	92
52	SeCan 17-24C-SCN	4221	62.8	13	2.0	124	1.0	94
53	SeCan 17-72C-SCN	4090	60.8	19	1.5	126	1.0	93
54	SeCan 17-75C-SCN	3717	55.3	35	1.8	119	1.0	99
55	SeCan 17-78C-SCN	3596	53.5	42	2.0	128	1.0	84
56	SeCan 17-83C-SCN	4494	66.8	6	2.0	126	1.3	106
57	SeCan 17-95C	3871	57.6	26	2.0	123	1.0	100
58	SeCan 17-132C	3942	58.6	23	2.0	137	1.2	102
59	PR100764-26	4070	60.5	20	2.0	122	1.0	85
60	PR120552Z9007-07	3667	54.5	38	1.5	124	1.8	110
61	PR120578Z9005-13	3606	53.6	40	1.8	128	1.3	108
62	OAC 17-80C-SCN	4409	65.6	10	1.5	124	1.3	97
63	OAC 17-85C-SCN	4949	73.6	2	1.7	128	1.3	100
64	OAC 17-93C	3272	48.7	60	2.0	124	1.2	99
65	OAC 17-98C	3411	50.7	52	2.0	121	1.3	107
66	OAC 17-112C	3440	51.2	49	2.0	121	1.2	103
67	OAC 17-129C	3729	55.4	33	2.0	126	1.3	98
68	Laurentian	4440	66.0	8	2.0	136	1.5	110
69	Cypress	3577	53.2	43	1.5	119	1.0	90
70	SVX17T0S28.	3608	53.6	39	1.7	121	1.0	91
71	Mystic	3763	56.0	30	2.5	132	1.3	90
72	OAC Prosper	4185	62.2	14	1.7	131	2.5	92
Mean		3746	55.7		2.0	125	1.3	96
C.V.		7.2	7.2		10.6	2.6	39.8	8.1
PR > F		0.00	0.00		0.00	0.00	0.00	0.00
SD(0.05)		364.0	6.4		0.3	5.2	0.8	12.6

Planting Date: May 14
Harvest Date: Oct 10
Yields adjusted to 13% moisture.
Herbicide: Basagran Forte, Assure II June 12

Seed Quality: 1 = good, 5 = poor
Lodging: 1 = good, 5 = poor
Analyzed - Nearest Neighbour - yield

2018 Soybean Variety Performance Roundup Ready - Exeter

Trt No.	Treatment Name	Yield kg/ha	Yield bu/ac	Rank	Seed Quality (1-5)	Days to Maturity	Lodging Score	Plant Height (cm)
1	CF31GR	4916	73.1	25	2.0	127	1.8	101
2	HS 19RYS14	5160	76.7	12	2.0	137	1.7	106
3	Maxo R2	4418	65.7	51	1.7	123	2.0	88
4	PS 1162 R2	3866	57.5	57	1.7	126	1.0	107
5	PRO 3025R2C	5324	79.2	6	1.7	133	1.7	111
6	Mateo R2	3836	57.0	59	1.5	129	1.5	103
7	5A075RR2	3667	54.5	60	2.2	122	1.0	96
8	5A105RR2	3638	54.1	61	2.2	128	1.2	96
9	PRO 2845R2C	4904	72.9	27	1.7	121	1.2	94
10	Mylitta R2	3857	57.4	58	1.7	128	1.3	95
11	P15T46R2	4779	71.1	40	2.2	128	1.7	93
12	Miko R2	3441	51.2	63	2.3	117	1.3	85
13	PS 1222 XRN	4785	71.1	39	1.8	123	1.0	93
14	PS 1666 XRN	4364	64.9	52	1.3	122	1.2	95
15	P19T39R2	4791	71.2	38	1.5	134	1.5	110
16	P10T48R	4423	65.8	50	1.0	122	1.2	87
17	Gibil R2X	4603	68.4	44	1.8	122	1.2	102
18	DKB09-91	4810	71.5	37	2.2	120	1.0	92
19	DKB14-41	4839	72.0	32	2.2	130	1.7	100
20	PS 1888 XRN	5155	76.7	13	1.0	131	1.7	106
21	Edge R2X	4602	68.4	45	1.2	126	1.3	94
22	DS095D1	4167	62.0	55	1.8	122	1.2	80
23	DS198T1	5342	79.4	5	1.7	138	1.5	105
24	Rx Titus	4815	71.6	36	1.7	124	1.3	99
25	Diablo R2X	5080	75.5	17	1.8	131	1.7	101
26	Dofino R2X	4819	71.7	34	2.3	126	2.2	93
27	Volcano R2	4816	71.6	35	2.0	127	1.8	96
28	DKB12-57	5282	78.5	8	1.7	126	1.3	102
29	S07-K5X	3292	48.9	64	2.5	116	1.0	80
30	S09-C3X	4928	73.3	23	1.2	117	1.0	80
31	S14-B2X	4935	73.4	22	1.5	127	1.3	91
32	S18-G4X	5246	78.0	9	2.0	133	2.0	107
33	Rx Response	4923	73.2	24	1.3	121	1.3	90
34	CF2858Xt	4274	63.6	53	1.5	128	1.7	105
35	CF3008Xt	5639	83.8	1	1.7	136	1.5	109
36	P09A53X	3512	52.2	62	2.0	121	1.0	87
37	P15A63X	5171	76.9	11	2.0	128	1.7	89
38	P19A14X	5390	80.1	3	2.0	136	1.3	105

39	PS 1338 XRN	4948	73.6	21	1.8	128	1.2	96
40	P09A62X	4518	67.2	47	2.2	120	1.5	82
41	P18A98X	5469	81.3	2	1.7	138	1.3	112
42	P16A13X	5312	79.0	7	1.7	136	1.8	105
43	EXP10-18	4904	72.9	28	1.3	121	1.2	92
44	EXP12-18	4915	73.1	26	1.5	127	1.5	103
45	EXP15-18	4876	72.5	30	1.7	128	1.3	106
46	CFS18.05 R2D	4981	74.1	19	1.5	122	1.2	93
47	CFS18.10 R2D	2851	42.4	66	2.0	126	1.0	99
48	Expert R2X	4022	59.8	56	1.7	120	1.0	87
49	RX Columbia	4949	73.6	20	1.5	128	2.3	106
50	RX Laser	4187	62.3	54	1.7	124	1.0	84
51	S09-R8X	4760	70.8	41	2.2	117	1.7	92
52	S12-P3X	4998	74.3	18	1.7	120	1.0	88
53	S14-T7X	4532	67.4	46	1.7	128	1.7	104
54	S18-H3X	5132	76.3	14	1.8	129	1.5	96
55	B080A1	4493	66.8	48	1.8	119	1.0	82
56	B120A1	4702	69.9	42	2.2	123	2.5	86
57	RX1018	4685	69.7	43	1.7	119	1.2	92
58	RX1518	5202	77.4	10	1.7	128	1.3	100
59	RX1818	5107	75.9	15	1.8	136	1.5	112
60	CF09X9	4851	72.1	31	1.7	117	1.0	84
61	CF13X9	4898	72.8	29	2.2	127	1.5	91
62	CF19X9	5345	79.5	4	1.5	137	2.0	114
63	PRO 10X06N	4455	66.2	49	1.3	120	1.8	90
64	PRO 12X236N	4837	71.9	33	1.5	128	1.8	114
65	PRO 16X346N	5090	75.7	16	2.2	129	1.7	94
66	Absolute RR	3278	48.7	65	1.8	116	1.0	82
Mean		4668	69.4		1.8	126	1.4	96
C.V.		7.9	7.9		14.4	2.1	33.9	7.5
PR > F		0.00	0.00		0.00	0.00	0.00	0.00
LSD(0.05)		597.0	8.9		0.4	4.3	0.8	11.7

Planting Date: May 14
Harvest Date: Oct 10
Yields adjusted to 13% moisture.
Herbicide: Basagran Forte, Assure II June 12

Seed Quality: 1 = good, 5 = poor
Lodging: 1 = good, 5 = poor
Analyzed - RCBD

NRC Research Press

ARTICLE

Microwave radiation effect with and without chemical seed treatments on halo blight infected seed, seed germination, plant vigour, and yield of dry beans

A.P. Friesen, R.L. Conner, D.E. Robinson, W.R. Barton, S. Chatterton, and C.L. Gillard

Abstract: Halo blight, caused by *Pseudomonas syringae* pv. *phaseolicola*, is a seed-borne disease of dry bean (*Phaseolus vulgaris* L.) that lowers seed quality and yield. Over 2 yr, laboratory and field studies were conducted to evaluate the effect of microwave radiation on two market classes: navy ('Envoy') and white kidney ('GTS 402') bean. In the laboratory, seed germination and vigour decreased up to 15% after 40 s of microwave exposure, where <7% decrease was observed during 0–30 s. Disease plating showed no correlation between pathogen colonization of the seed and microwave radiation, as incidence of pathogen colonization was low across all exposure times. In field trials in Morden and Winkler, MB, microwave radiation was tested alone and in combination with copper hydroxide 53.8% and pyraclostrobin + fluxapyroxad + metalaxyl. Seed treatment with copper hydroxide slightly decreased the incidence of halo blight but had little impact on seed pick, hundred-seed weight, yield, or return on investment. Pyraclostrobin + fluxapyroxad + metalaxyl seed treatment had no effect on any of these parameters. Microwave radiation lowered seed emergence by up to 9% but did not reduce disease incidence and severity or increase yield or return of investment when applied alone or in combination with a chemical treatment.

Key words: disease, dry bean, halo blight, microwave, *Pseudomonas syringae* pv. *phaseolicola*, seed-borne.

Résumé : La graisse du haricot (*Phaseolus vulgaris* L.), attribuable à *Pseudomonas syringae* pv. *phaseolicola*, est une maladie transmise par la semence qui nuit à la qualité des graines et au rendement. Pendant deux ans, les auteurs ont effectué des études en laboratoire et sur le terrain afin d'évaluer les effets des micro-ondes sur deux types commerciaux de haricot : le petit haricot blanc (cv. Envoy) et le haricot blanc (cv. GTS 402). En laboratoire, une exposition de 40 s aux rayonnements diminue la germination et la vigueur des plants de jusqu'à 15 %, la baisse étant inférieure à 7 % quand l'exposition ne dépasse pas 30 s. La culture du pathogène en boîte de Pétri n'indique aucune corrélation entre la colonisation de la graine par la bactérie et l'intensité des rayonnements. En effet, la colonisation demeure faible, peu importe la durée de l'exposition. Lors des essais sur le terrain, à Morden et à Winkler (Manitoba), les auteurs ont testé l'exposition aux micro-ondes seule et en combinaison avec l'application d'hydroxyde de cuivre à 53,8 % ainsi que de pyraclostrobine + fluxapyroxad + métalaxyl. Traiter les semences avec de l'hydroxyde de cuivre atténue légèrement l'incidence de la maladie, mais a peu d'impact sur le piquetage des graines, le poids de cent graines, le rendement grainier et le rendement du capital investi. Le traitement au pyraclostrobine + fluxapyroxad + métalaxyl n'agit pas sur ces paramètres. Les micro-ondes réduisent la levée de jusqu'à 9 %, mais pas l'incidence ni la gravité de la maladie, et elles n'augmentent pas le rendement grainier ni le rendement sur le capital investi qu'on recoure uniquement aux rayonnements ou qu'on les combine à un traitement chimique. [Traduit par la Rédaction]

Mots-clés : maladie, haricot, graisse du haricot, micro-ondes, *Pseudomonas syringae* pv. *phaseolicola*, transmission par la semence.

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