Date: October 12, 2011

11-815-463 – FINAL REPORT

Heads Up® Seed Treatment and Foliar sprays for Reducing Whitemold in Dry Bean-2011

Study Director and Contact:
Michael Harding, PhD, Research Associate
michael.harding@innovotech.ca

Research Director
Merle E. Olson, DVM, Research Director
merle.olson@innovotech.ca

CONTENTS

Purpose 2
Background 2
Materials 2
Procedure 2-6
Results 7-9
Summary 9

Revision 0:	Shari Lepp	October 11, 2011
Revision 1:	Shari Lepp	October 12, 2011
Revision 2:	Michael Harding	October 26, 2011

Approved By:

Senior Scientist: Michael Harding, PhD, Innovotech Inc., Brooks, Alberta	Date
Research Director: Merle Olson, DVM, MSc, Innovotech Inc., Edmonton, Alberta	Date

1.0 PURPOSE

1.1 To evaluate the efficacy of Heads Up® Plant Protectant as a seed treatment for control of white mold on dry edible bean.

1.2 To evaluate the efficacy of Heads Up® Plant Protectant tank mixed with an industry standard seed treatment fungicide (Cruiser Maxx® Beans + Streptomycin) for control of white mold on dry edible bean.

2.0 BACKGROUND

White mold caused by *Sclerotinia sclerotiorum* (Lib.) de Bary is one of the most devastating diseases of pulse and legume crops in many areas of the world. It is the main production constraint in dry bean production in many areas of western Canada. Crop rotation is of marginal effectiveness in managing the disease due to the pathogens ability to survive many years in soil as sclerotia. Fungicides are a primary method of disease management however the loss of Ronilan EG (Vinclozolin) has left the dry bean and soybean industry with no fungicide alternatives that equal its efficacy and flexibility. New fungicides, combinations and additives are currently being sought to fill the gap in white mold management on beans.

Heads Up® Plant Protectant is a "is a natural source plant defense 'activator'" that "can be beneficial in controlling several types of fungal and bacterial diseases." (http://www.sar-headsup.com/history.php). It is currently registered in the USA for use on beans and soybeans for control of white mold. The purpose of this study is to evaluate the level of white mold control achieved on dry edible bean in southern Alberta.

3.0 MATERIALS

Table 1. Organisms used.

#	PLANT SPECIES	MARKET CLASS	CULTIVAR
2	*Phaseolus vulgaris* L.	Pinto	'Winchester'
#	**PATHOGEN SPECIES**	**DISEASE**	**SOURCE**
1	*Sclerotinia sclerotiorum* (Lib.) de Bary	White mold	Sclerotia in soil

Table 2. Treatment materials.

TRT	Product	Product Rate	Timing	Placement
1	Check (water)	n/a	Pre-seed	Seed
2	Cruiser Maxx® Beans	195-mL/100kg seed	Pre-seed	Seed
3	Heads Up®	1 gm./litre/160 Kg.Seed	Pre-seed	Seed
4	Heads Up®+ (Cruiser Maxx® Beans + Strep)	Heads Up ® @ 1gm/litre CMB = 195-mL/100kg seed Streptomycin = 5% (w/v)	Pre-seed	Seed

4.0 PROCEDURE

4.1 TREATMENT OF BEAN SEED

Treatment solutions are prepared according to Table 3.

Dry bean seed for treatments 1 and 3 was not commercially treated. Seed for treatments 2 and 4 was commercially treated with a fungicidal seed treatment, Maxim 4SF, Apron Maxx RTA, and a 5% bactericidal seed treatment, streptomycin. A total of 85 seeds per 6-m row were prepared. Seeds were packaged using an Old Mill electronic seed counter, which counted 85-seed batches into small coin envelopes. Packaged seed was kept at 5ºC until seeding.

4.2 PREPARATION OF FIELD, SEEDING AND AGRONOMY

Field 74 of Lendrum Farm at CDCS was opened with a vibrashank-style cultivator. Soil was adjusted to 50-lbs/N per acre and Edge herbicide applied according to label specifications and incorporated by working soil twice with a vibrashank-style cultivator and harrows. Beans were seeded four rows at a time. Rows were 6-m in length and 70-cm apart. Eighty five seeds per row were sown 3-5 cm deep to give a density of 23.5 plants/m^2 (95,000 plants/acre). Treatment rows were arranged in a randomized complete block design with four replicate blocks. A plot plan diagram is given in Figure 1. Beans were seeded using 4-row cone-style disc drill seeder.

4.5 HARVEST PROCEDURE

Beans were undercut when pods reached approximately 75% buckskin appearance. Ten days after undercutting, beans were mature and dry. At that time, plots were machine-harvested using a Wintersteiger plot combine. The harvested seed from the center 2 rows in each 4-row subplot was collected separately in labelled mesh bags. Harvested seed

from each subplot was individually weighted using a Denver Instrument DA series weight scale (Model #DA60EDP-LO-US). Each bag was put through a forced-air seed blower to remove the large pieces of dirt and chaff. Each bag was then put through a Clipper Office Tester (Model O.T., Serial #F92050308) to remove smaller chaff and split seeds. Once the bags were put through both machines, they were weighed again using the same scale. A 50-g sub-sample from each subplot was weighed before and after drying (48-hrs @ 65°C) to determine % moisture.

4.6 DATA COLLECTION

1. Five emergence counts were taken weekly beginning 2- to 3-weeks after seeding. Average emergence is given in Figure 3.
2. Disease ratings were taken after the onset of disease on 25 plants within each subplot
    a. Disease incidence was the % of plants with white mold symptoms
    b. Disease severity was estimated using a scale of 0-5 (see below).
    c. Yield was calculated as grams of harvested seed per subplot.

The plants disease severity was rated using the Kutcher 0-5 rating scale:

0 = no symptoms
1 = infections limited to pods of the plant
2 = ¼ of plant affected, usually one to two main branches
3 = ½ of plant affected, usually two to three main branches
4 = ¾ of plant affected, usually three or more branches
5 = main stem lesion near the base affecting entire plant

RESULTS

Emergence results are given in Figure 3. Disease incidence and severity ratings were first taken 49 DAP. No disease symptoms appeared until the fourth rating taken 80 DAP. White mold incidence and severity after 80 DAP are shown in Figures 4-5. Yield data are shown in Figure 6. Average dockages per treatment are shown in Figure 7. A photograph of the plot is shown in Figure 8. Statistical analyses and raw data are given in Appendix 1.

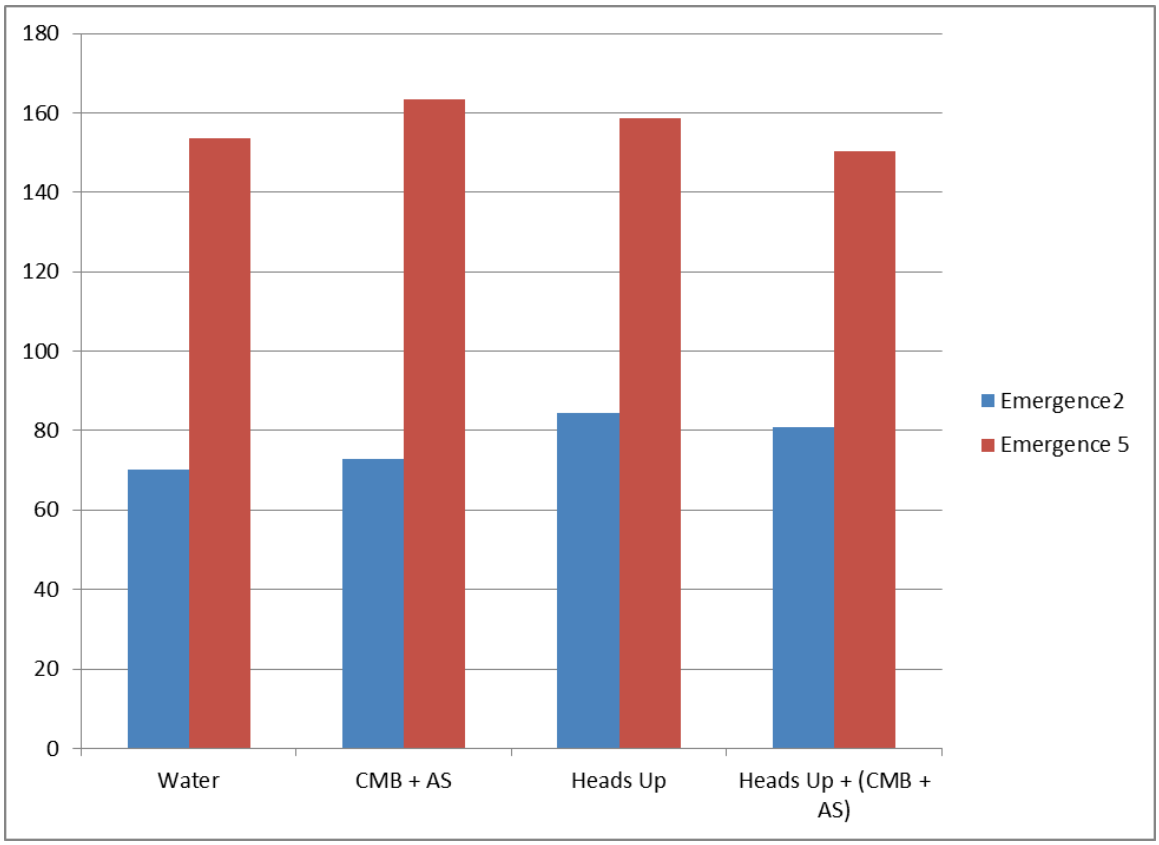

Figure 3: Average emergence approximately 4 weeks (Emergence 2) and 7 weeks (Emergence 5) after planting

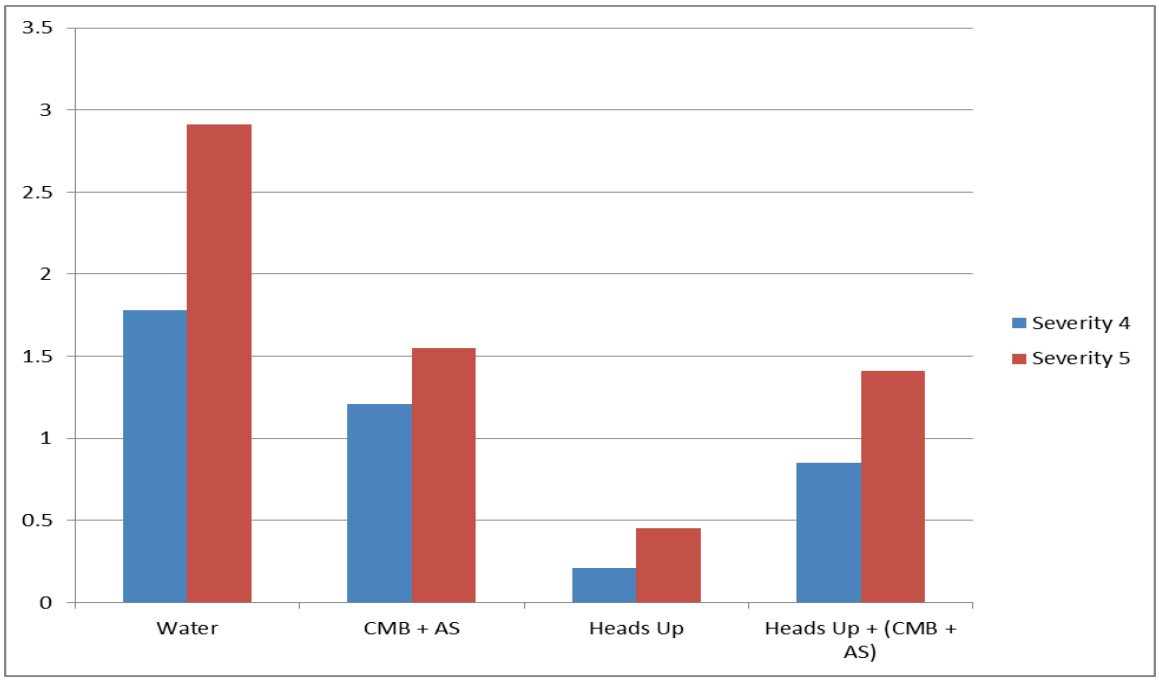

Figure 4: Disease Severity Ratings #4 (18-Aug-2011) and #5 (25-Aug-2011).

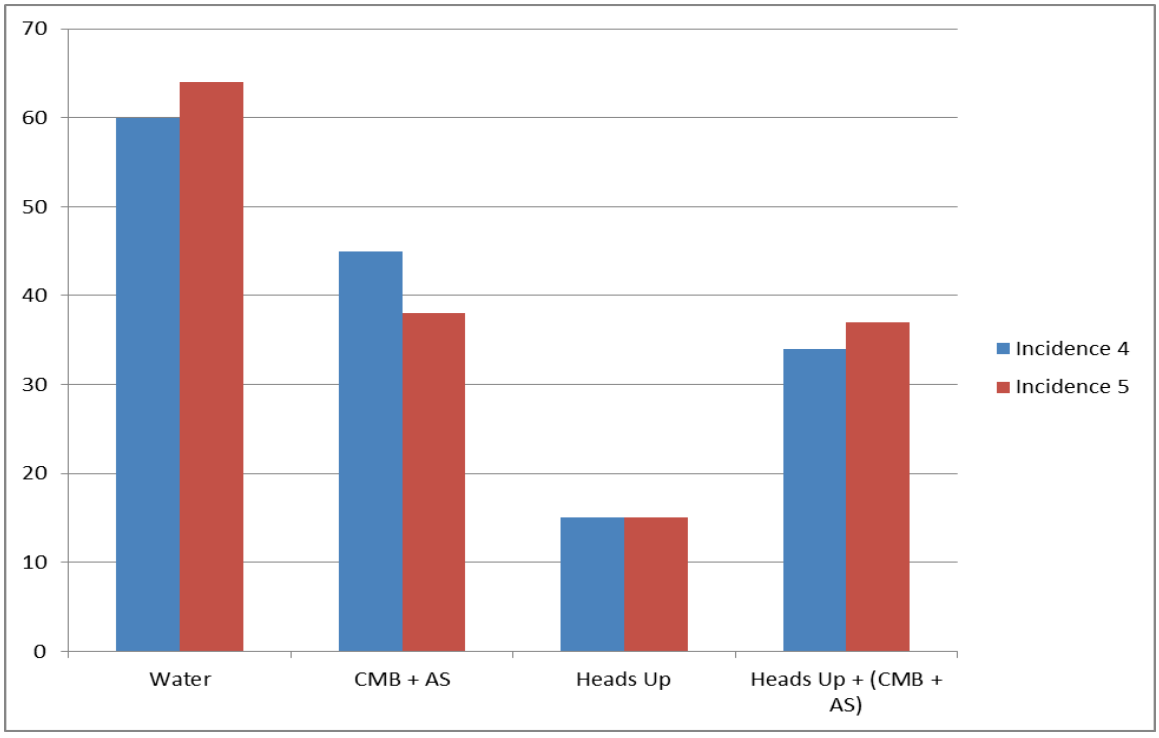

Figure 5: Disease Incidence Ratings #4 (18-Aug-2011) and #5 (25-Aug-2011).

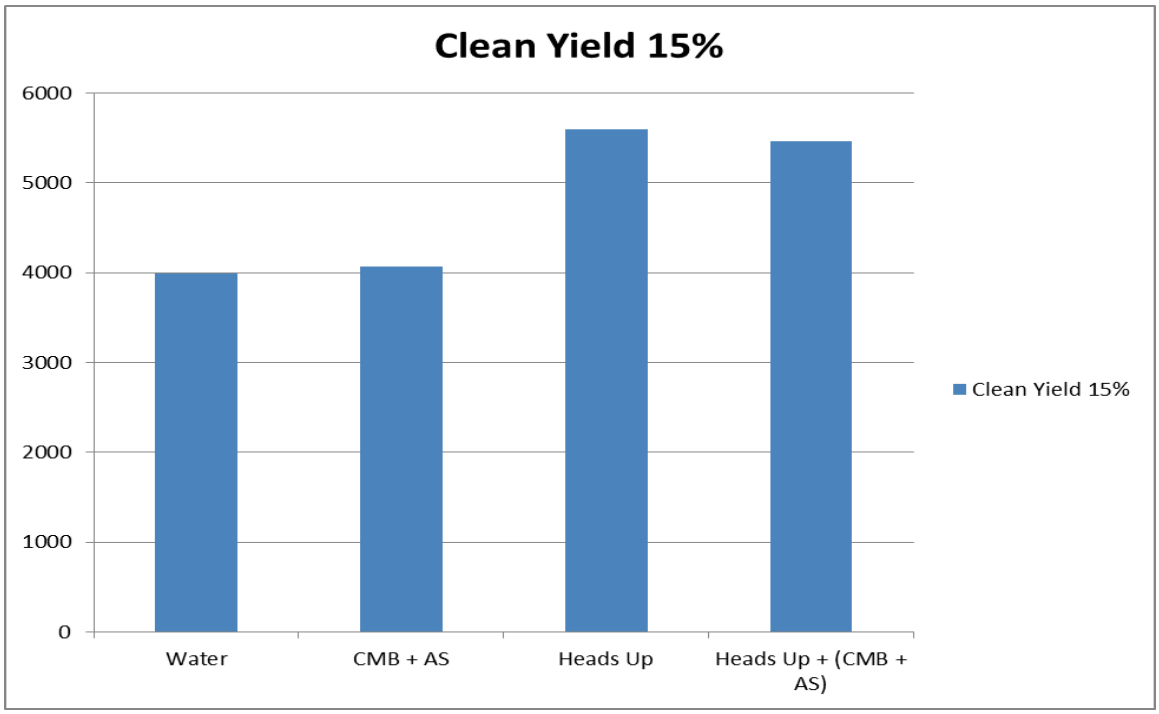

Figure 6: Clean seed yields (adjusted to 15% moisture).

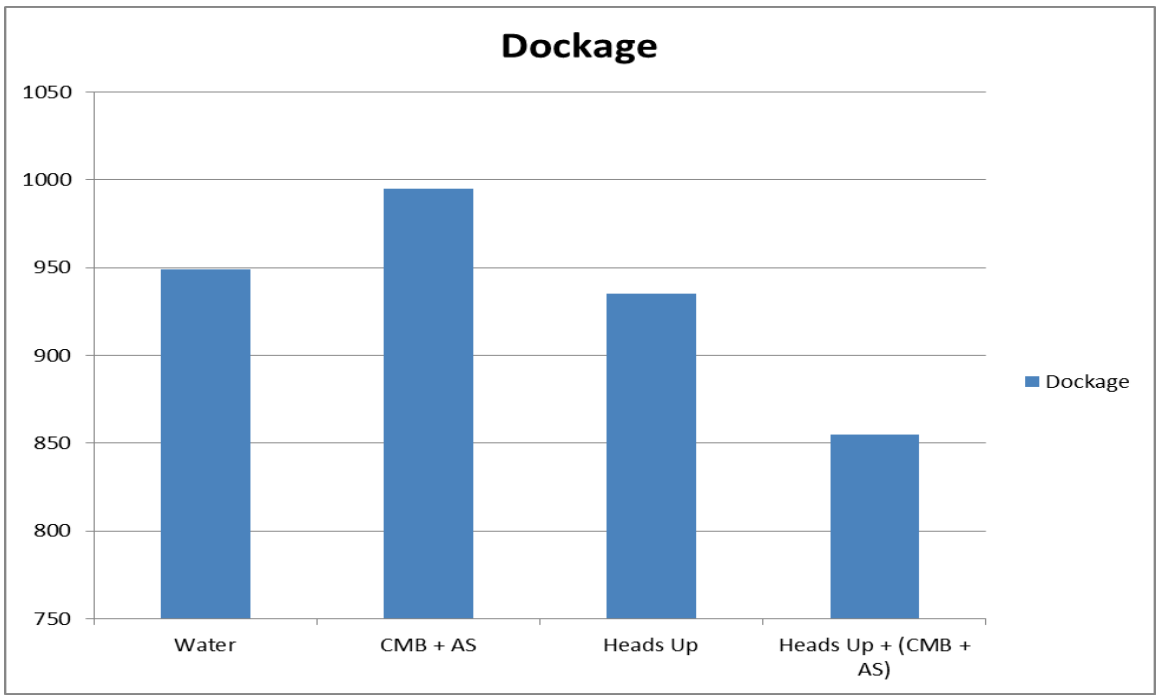

Figure 7: Average dockage per treatment

Figure 8: Plot photo

6.0 SUMMARY

- Heads Up® significantly reduced white mold incidence (77% reduction) and severity (84.5% reduction) compared with the check treatments.
- Heads Up® did not appear to be completely compatible with commercial seed treatment Cruiser Maxx Beans as the level of white mold control was reduced when Heads Up® was applied to seed that had been commercially treated.
- Heads Up® did not have an effect on dockage.
- Heads Up® improved yield by 40% compared with the untreated check

APPENDIX 1. Statisical analyses and raw data.

Innovotech Inc.

OMEX White Mold Trial -11-1507-462

Trial ID: 11-1507-462 Protocol ID: 11-1507-462
Location: BROOKS, AB Study Director: MICHAEL HARDING
Project ID: Investigator: Dr. Michael Harding
Sponsor Contact:

Pest Type	D Disease	D Disease	D Disease	D Disease	D Disease	D Disease
Pest Code	SCLESC	SCLESC	SCLESC	SCLESC	SCLESC	SCLESC
Pest Scientific Name	Sclerotinia sc>	Sclerotinia sc>	Sclerotinia sc>	Sclerotinia sc>	Sclerotinia sc>	Sclerotinia sc>
Pest Name	Cottony rot	Cottony rot	Cottony rot	Cottony rot	Cottony rot	Cottony rot
Crop Code	PHSSS	PHSSS	PHSSS	PHSSS	PHSSS	PHSSS
BBCH Scale	BVBE	BVBE	BVBE	BVBE	BVBE	BVBE
Crop Scientific Name	Phaseolus sp.	Phaseolus sp.	Phaseolus sp.	Phaseolus sp.	Phaseolus sp.	Phaseolus sp.
Crop Name	Bean	Bean	Bean	Bean	Bean	Bean
Part Rated	SEEDLI C	SEEDLI C	SEEDLI C	SEEDLI C	SEEDLI C	PLANT C
Rating Date	Jun-6-2011	Jun-13-2011	Jun-22-2011	Jun-27-2011	Jul-4-2011	Jul-18-2011
Rating Type	EMERGE	EMERGE	EMERGE	EMERGE	EMERGE	PESSEV
Rating Unit	NUMBER	NUMBER	NUMBER	NUM	NUMBER	0-4
Sample Size, Unit	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Number of Subsamples	1	1	1	1	1	1
Trt No. Treatment Name	1	2	3	4	5	6
1 Cruiser Maxx Beans	0.0 a	73.0 a	122.3 a	163.3 a	163.3 a	0.0 a
2 Water	0.0 a	70.3 a	108.3 a	152.5 a	153.5 a	0.0 a
11 Heads up	0.0 a	84.3 a	115.5 a	157.5 a	158.8 a	0.0 a
12 Heads Up + Cruiser Maxx + Streptomycin	0.0 a	80.8 a	113.5 a	149.5 a	150.3 a	0.0 a
LSD (P=.05)	0.00	29.49	30.31	35.34	31.12	0.00
Standard Deviation	0.00	18.44	18.95	22.10	19.45	0.00
CV	0.0	23.92	16.49	14.19	12.44	0.0
Bartlett's X2	0.0	0.365	2.442	4.278	3.443	0.0
P(Bartlett's X2)	.	0.947	0.486	0.233	0.328	.
Replicate F	0.000	0.952	0.472	0.090	0.264	0.000
Replicate Prob(F)	1.0000	0.4557	0.7094	0.9640	0.8500	1.0000
Treatment F	0.000	0.503	0.373	0.297	0.348	0.000
Treatment Prob(F)	1.0000	0.6898	0.7743	0.8265	0.7919	1.0000

Innovotech Inc.

OMEX White Mold Trial -11-1507-462

Trial ID: 11-1507-462 Protocol ID: 11-1507-462
Location: BROOKS, AB Study Director: MICHAEL HARDING
Project ID: Investigator: Dr. Michael Harding
Sponsor Contact:

Pest Type	D Disease	D Disease	D Disease	D Disease	D Disease	D Disease
Pest Code	SCLESC	SCLESC	SCLESC	SCLESC	SCLESC	SCLESC
Pest Scientific Name	Sclerotinia sc>	Sclerotinia sc>	Sclerotinia sc>	Sclerotinia sc>	Sclerotinia sc>	Sclerotinia sc>
Pest Name	Cottony rot	Cottony rot	Cottony rot	Cottony rot	Cottony rot	Cottony rot
Crop Code	PHSSS	PHSSS	PHSSS	PHSSS	PHSSS	PHSSS
BBCH Scale	BVBE	BVBE	BVBE	BVBE	BVBE	BVBE
Crop Scientific Name	Phaseolus sp.	Phaseolus sp.	Phaseolus sp.	Phaseolus sp.	Phaseolus sp.	Phaseolus sp.
Crop Name	Bean	Bean	Bean	Bean	Bean	Bean
Part Rated	PLANT C	PLANT C	PLANT C	PLANT C	PLANT C	PLANT C
Rating Date	Jul-25-2011	Jul-28-2011	Aug-18-2011	Aug-25-2011	Jul-18-2011	Jul-25-2011
Rating Type	PESSEV	PESSEV	PESSEV	PESSEV	PESINC	PESINC
Rating Unit	0-4	0-4	0-4	0-4	%	%
Sample Size, Unit	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Number of Subsamples	1	1	1	1	1	1
Trt Treatment No. Name	7	8	9	10	11	12
1 Cruiser Maxx Beans	0.0 a	0.0 a	1.210 ab	1.550 a	0.0 a	0.0 a
2 Water	0.0 a	0.0 a	1.780 a	2.910 a	0.0 a	0.0 a
11 Heads up	0.0 a	0.0 a	0.210 c	0.450 a	0.0 a	0.0 a
12 Heads Up + Cruiser Maxx + Streptomycin	0.0 a	0.0 a	0.850 bc	1.410 a	0.0 a	0.0 a
LSD (P=.05)	0.00	0.00	0.9180	2.1610	0.00	0.00
Standard Deviation	0.00	0.00	0.5740	1.3510	0.00	0.00
CV	0.0	0.0	56.69	85.51	0.0	0.0
Bartlett's X2	0.0	0.0	6.318	11.016	0.0	0.0
P(Bartlett's X2)	.	.	0.097	0.012*	.	.
Replicate F	0.000	0.000	0.632	0.477	0.000	0.000
Replicate Prob(F)	1.0000	1.0000	0.6128	0.7059	1.0000	1.0000
Treatment F	0.000	0.000	5.255	2.247	0.000	0.000
Treatment Prob(F)	1.0000	1.0000	0.0228	0.1521	1.0000	1.0000

Innovotech Inc.

OMEX White Mold Trial -11-1507-462

Trial ID: 11-1507-462 Protocol ID: 11-1507-462
Location: BROOKS, AB Study Director: MICHAEL HARDING
Project ID: Investigator: Dr. Michael Harding
Sponsor Contact:

Pest Type	D Disease	D Disease	D Disease	D Disease	D Disease	D Disease
Pest Code	SCLESC	SCLESC	SCLESC	SCLESC	SCLESC	SCLESC
Pest Scientific Name	Sclerotinia sc>	Sclerotinia sc>	Sclerotinia sc>	Sclerotinia sc>	Sclerotinia sc>	Sclerotinia sc>
Pest Name	Cottony rot	Cottony rot	Cottony rot	Cottony rot	Cottony rot	Cottony rot
Crop Code	PHSSS	PHSSS	PHSSS	PHSSS	PHSSS	PHSSS
BBCH Scale	BVBE	BVBE	BVBE	BVBE	BVBE	BVBE
Crop Scientific Name	Phaseolus sp.	Phaseolus sp.	Phaseolus sp.	Phaseolus sp.	Phaseolus sp.	Phaseolus sp.
Crop Name	Bean	Bean	Bean	Bean	Bean	Bean
Part Rated	PLANT C	PLANT C	PLANT C	SEED C	SEED C	SEED C
Rating Date	Jul-28-2011	Aug-18-2011	Aug-25-2011	Sep-23-2011	Oct-11-2011	Oct-6-2011
Rating Type	PESINC	PESINC	PESINC	YIELD	Clean Yield	DOCKAG
Rating Unit	%	%	%	g/plot	g/plot	g
Sample Size, Unit	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Number of Subsamples	1	1	1	1	1	1
Trt Treatment No. Name	13	14	15	16	17	18
1 Cruiser Maxx Beans	0.0 a	45.0 ab	38.0 a	4687.5 b	3692.5 b	995.0 a
2 Water	0.0 a	60.0 a	64.0 a	4566.3 b	3617.5 b	948.8 a
11 Heads up	0.0 a	15.0 c	15.0 a	5962.5 a	5027.5 a	935.0 a
12 Heads Up + Cruiser Maxx + Streptomycin	0.0 a	34.0 bc	37.0 a	5743.8 a	4888.8 a	855.0 a
LSD (P=.05)	0.00	21.88	41.20	815.05	870.79	350.63
Standard Deviation	0.00	13.68	25.76	509.58	544.43	219.21
CV	0.0	35.53	66.91	9.72	12.64	23.48
Bartlett's X2	0.0	1.633	15.148	0.751	2.595	3.367
P(Bartlett's X2)	.	0.652	0.002*	0.861	0.458	0.338
Replicate F	0.000	1.575	0.685	10.884	5.759	2.998
Replicate Prob(F)	1.0000	0.2623	0.5833	0.0024	0.0177	0.0878
Treatment F	0.000	7.675	2.421	7.882	7.695	0.282
Treatment Prob(F)	1.0000	0.0075	0.1331	0.0069	0.0074	0.8369

Innovotech Inc.

OMEX White Mold Trial -11-1507-462

Trial ID: 11-1507-462 Protocol ID: 11-1507-462
Location: BROOKS, AB Study Director: MICHAEL HARDING
Project ID: Investigator: Dr. Michael Harding
Sponsor Contact:

Pest Type	D Disease
Pest Code	SCLESC
Pest Scientific Name	Sclerotinia sc>
Pest Name	Cottony rot
Crop Code	PHSSS
BBCH Scale	BVBE
Crop Scientific Name	Phaseolus sp.
Crop Name	Bean
Part Rated	SEED C
Rating Date	Oct-9-2011
Rating Type	YIELD
Rating Unit	15%
Sample Size, Unit	1 PLOT
Number of Subsamples	1

Trt No.	Treatment Name	19
1	Cruiser Maxx Beans	4069.61076 b
2	Water	3994.81998 b
11	Heads up	5596.19734 a
12	Heads Up + Cruiser Maxx + Streptomycin	5466.69195 a

LSD (P=.05)	984.903297
Standard Deviation	615.766358
CV	12.88
Bartlett's X2	2.741
P(Bartlett's X2)	0.433
Replicate F	5.326
Replicate Prob(F)	0.0220
Treatment F	7.943
Treatment Prob(F)	0.0067

Innovotech Inc.

OMEX White Mold Trial -11-1507-462

Trial ID: 11-1507-462 Protocol ID: 11-1507-462
Location: BROOKS, AB Study Director: MICHAEL HARDING
Project ID: Investigator: Dr. Michael Harding
Sponsor Contact:

Pest Type
D, Disease, G-BYRD7, G-DisStg = Disease, such as a fungus, bacteria, or virus
Pest Code
SCLESC, Sclerotinia sclerotiorum, = US
Crop Code
PHSSS, BVBE, Phaseolus sp., = US
Part Rated
SEEDLI = seedling
PLANT = plant
SEED = seed
C = Crop is Part Rated
Rating Type
EMERGE = emergence
PESSEV = pest severity
PESINC = pest incidence
YIELD = yield
DOCKAG = dockage
Rating Unit
NUMBER = number
0-4 = 0-4 index/scale
% = percent
g = gram

PLOT = total plot

Innovotech Inc.

OMEX White Mold Trial -11-1507-462

Trial ID: 11-1507-462 Protocol ID: 11-1507-462
Location: BROOKS, AB Study Director: MICHAEL HARDING
Project ID: Investigator: Dr. Michael Harding
Sponsor Contact:

Pest Type		D Disease	D Disease	D Disease	D Disease	D Disease
Pest Code		SCLESC	SCLESC	SCLESC	SCLESC	SCLESC
Pest Scientific Name		Sclerotinia sc>	Sclerotinia sc>	Sclerotinia sc>	Sclerotinia sc>	Sclerotinia sc>
Pest Name		Cottony rot	Cottony rot	Cottony rot	Cottony rot	Cottony rot
Crop Code		PHSSS	PHSSS	PHSSS	PHSSS	PHSSS
BBCH Scale		BVBE	BVBE	BVBE	BVBE	BVBE
Crop Scientific Name		Phaseolus sp.	Phaseolus sp.	Phaseolus sp.	Phaseolus sp.	Phaseolus sp.
Crop Name		Bean	Bean	Bean	Bean	Bean
Part Rated		SEEDLI C	SEEDLI C	SEEDLI C	SEEDLI C	SEEDLI C
Rating Date		Jun-6-2011	Jun-13-2011	Jun-22-2011	Jun-27-2011	Jul-4-2011
Rating Type		EMERGE	EMERGE	EMERGE	EMERGE	EMERGE
Rating Unit		NUMBER	NUMBER	NUMBER	NUM	NUMBER
Sample Size, Unit		1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Number of Subsamples		1	1	1	1	1
Trt No.	Treatment Name	Plot	1	2	3	4	5
1	Cruiser Maxx Beans	101	0.0	62.0	122.0	156.0	153.0
		204	0.0	55.0	115.0	166.0	166.0
		303	0.0	71.0	117.0	171.0	176.0
		407	0.0	104.0	135.0	160.0	158.0
		Mean =	0.0	73.0	122.3	163.3	163.3
2	Water	102	0.0	73.0	122.0	177.0	162.0
		201	0.0	78.0	95.0	142.0	162.0
		304	0.0	48.0	96.0	144.0	144.0
		406	0.0	82.0	120.0	147.0	146.0
		Mean =	0.0	70.3	108.3	152.5	153.5
11	Heads up	111	0.0	57.0	88.0	132.0	137.0
		211	0.0	98.0	144.0	192.0	187.0
		311	0.0	95.0	122.0	157.0	157.0
		411	0.0	87.0	108.0	149.0	154.0
		Mean =	0.0	84.3	115.5	157.5	158.8
12	Heads Up + Cruiser Maxx + Streptomycin	112	0.0	96.0	125.0	146.0	147.0
		212	0.0	57.0	90.0	128.0	125.0
		312	0.0	81.0	105.0	141.0	145.0
		412	0.0	89.0	134.0	183.0	184.0
		Mean =	0.0	80.8	113.5	149.5	150.3

Innovotech Inc.

OMEX White Mold Trial -11-1507-462

Trial ID: 11-1507-462 Protocol ID: 11-1507-462
Location: BROOKS, AB Study Director: MICHAEL HARDING
Project ID: Investigator: Dr. Michael Harding
Sponsor Contact:

Pest Type		D Disease	D Disease	D Disease	D Disease	D Disease
Pest Code		SCLESC	SCLESC	SCLESC	SCLESC	SCLESC
Pest Scientific Name		Sclerotinia sc>	Sclerotinia sc>	Sclerotinia sc>	Sclerotinia sc>	Sclerotinia sc>
Pest Name		Cottony rot	Cottony rot	Cottony rot	Cottony rot	Cottony rot
Crop Code		PHSSS	PHSSS	PHSSS	PHSSS	PHSSS
BBCH Scale		BVBE	BVBE	BVBE	BVBE	BVBE
Crop Scientific Name		Phaseolus sp.	Phaseolus sp.	Phaseolus sp.	Phaseolus sp.	Phaseolus sp.
Crop Name		Bean	Bean	Bean	Bean	Bean
Part Rated		PLANT C	PLANT C	PLANT C	PLANT C	PLANT C
Rating Date		Jul-18-2011	Jul-25-2011	Jul-28-2011	Aug-18-2011	Aug-25-2011
Rating Type		PESSEV	PESSEV	PESSEV	PESSEV	PESSEV
Rating Unit		0-4	0-4	0-4	0-4	0-4
Sample Size, Unit		1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Number of Subsamples		1	1	1	1	1
Trt No.	Treatment Name	Plot	6	7	8	9	10
1	Cruiser Maxx Beans	101	0.0	0.0	0.0	1.080	0.920
		204	0.0	0.0	0.0	1.160	1.320
		303	0.0	0.0	0.0	2.320	3.960
		407	0.0	0.0	0.0	0.280	0.000
		Mean =	0.0	0.0	0.0	1.210	1.550
2	Water	102	0.0	0.0	0.0	2.160	4.600
		201	0.0	0.0	0.0	2.320	4.320
		304	0.0	0.0	0.0	1.000	1.200
		406	0.0	0.0	0.0	1.640	1.520
		Mean =	0.0	0.0	0.0	1.780	2.910
11	Heads up	111	0.0	0.0	0.0	0.280	0.840
		211	0.0	0.0	0.0	0.000	0.240
		311	0.0	0.0	0.0	0.400	0.480
		411	0.0	0.0	0.0	0.160	0.240
		Mean =	0.0	0.0	0.0	0.210	0.450
12	Heads Up + Cruiser Maxx + Streptomycin	112	0.0	0.0	0.0	0.760	0.880
		212	0.0	0.0	0.0	0.560	1.400
		312	0.0	0.0	0.0	1.320	1.600
		412	0.0	0.0	0.0	0.760	1.760
		Mean =	0.0	0.0	0.0	0.850	1.410

Innovotech Inc.

OMEX White Mold Trial -11-1507-462

Trial ID: 11-1507-462 Protocol ID: 11-1507-462
Location: BROOKS, AB Study Director: MICHAEL HARDING
Project ID: Investigator: Dr. Michael Harding
Sponsor Contact:

Pest Type		D Disease	D Disease	D Disease	D Disease	D Disease
Pest Code		SCLESC	SCLESC	SCLESC	SCLESC	SCLESC
Pest Scientific Name		Sclerotinia sc>	Sclerotinia sc>	Sclerotinia sc>	Sclerotinia sc>	Sclerotinia sc>
Pest Name		Cottony rot	Cottony rot	Cottony rot	Cottony rot	Cottony rot
Crop Code		PHSSS	PHSSS	PHSSS	PHSSS	PHSSS
BBCH Scale		BVBE	BVBE	BVBE	BVBE	BVBE
Crop Scientific Name		Phaseolus sp.	Phaseolus sp.	Phaseolus sp.	Phaseolus sp.	Phaseolus sp.
Crop Name		Bean	Bean	Bean	Bean	Bean
Part Rated		PLANT C	PLANT C	PLANT C	PLANT C	PLANT C
Rating Date		Jul-18-2011	Jul-25-2011	Jul-28-2011	Aug-18-2011	Aug-25-2011
Rating Type		PESINC	PESINC	PESINC	PESINC	PESINC
Rating Unit		%	%	%	%	%
Sample Size, Unit		1 PLOT	1 PLOT	1 PLOT	1 PLOT	1 PLOT
Number of Subsamples		1	1	1	1	1
Trt No.	Treatment Name	Plot	11	12	13	14	15
1	Cruiser Maxx Beans	101	0.0	0.0	0.0	52.0	36.0
		204	0.0	0.0	0.0	36.0	28.0
		303	0.0	0.0	0.0	68.0	88.0
		407	0.0	0.0	0.0	24.0	0.0
		Mean =	0.0	0.0	0.0	45.0	38.0
2	Water	102	0.0	0.0	0.0	64.0	96.0
		201	0.0	0.0	0.0	68.0	88.0
		304	0.0	0.0	0.0	48.0	36.0
		406	0.0	0.0	0.0	60.0	36.0
		Mean =	0.0	0.0	0.0	60.0	64.0
11	Heads up	111	0.0	0.0	0.0	8.0	20.0
		211	0.0	0.0	0.0	0.0	8.0
		311	0.0	0.0	0.0	36.0	16.0
		411	0.0	0.0	0.0	16.0	16.0
		Mean =	0.0	0.0	0.0	15.0	15.0
12	Heads Up + Cruiser Maxx + Streptomycin	112	0.0	0.0	0.0	24.0	32.0
		212	0.0	0.0	0.0	24.0	36.0
		312	0.0	0.0	0.0	52.0	40.0
		412	0.0	0.0	0.0	36.0	40.0
		Mean =	0.0	0.0	0.0	34.0	37.0

Innovotech Inc.

OMEX White Mold Trial -11-1507-462

Trial ID: 11-1507-462 Protocol ID: 11-1507-462
Location: BROOKS, AB Study Director: MICHAEL HARDING
Project ID: Investigator: Dr. Michael Harding
Sponsor Contact:

Pest Type		D Disease	D Disease	D Disease	D Disease
Pest Code		SCLESC	SCLESC	SCLESC	SCLESC
Pest Scientific Name		Sclerotinia sc>	Sclerotinia sc>	Sclerotinia sc>	Sclerotinia sc>
Pest Name		Cottony rot	Cottony rot	Cottony rot	Cottony rot
Crop Code		PHSSS	PHSSS	PHSSS	PHSSS
BBCH Scale		BVBE	BVBE	BVBE	BVBE
Crop Scientific Name		Phaseolus sp.	Phaseolus sp.	Phaseolus sp.	Phaseolus sp.
Crop Name		Bean	Bean	Bean	Bean
Part Rated		SEED C	SEED C	SEED C	SEED C
Rating Date		Sep-23-2011	Oct-11-2011	Oct-6-2011	Oct-9-2011
Rating Type		YIELD	Clean Yield	DOCKAG	YIELD
Rating Unit		g/plot	g/plot	g	15%
Sample Size, Unit		1 PLOT	1 PLOT	1 PLOT	1 PLOT
Number of Subsamples		1	1	1	1
Trt No.	Treatment Name	Plot	16	17	18	19
1	Cruiser Maxx Beans	101	3700.0	2835.0	865.0	3195.49177
		204	4320.0	3090.0	1230.0	3308.77108
		303	4300.0	3330.0	970.0	3675.23816
		407	6430.0	5515.0	915.0	6098.94202
		Mean =	4687.5	3692.5	995.0	4069.61076
2	Water	102	4095.0	3345.0	750.0	3731.47449
		201	3790.0	3170.0	620.0	3528.02379
		304	4380.0	3385.0	995.0	3655.14587
		406	6000.0	4570.0	1430.0	5064.63576
		Mean =	4566.3	3617.5	948.8	3994.81998
11	Heads up	111	4830.0	4275.0	555.0	4768.92479
		211	5985.0	5165.0	820.0	5761.75351
		311	6555.0	5550.0	1005.0	6165.22230
		411	6480.0	5120.0	1360.0	5688.88924
		Mean =	5962.5	5027.5	935.0	5596.19734
12	Heads Up + Cruiser Maxx + Streptomycin	112	5230.0	4475.0	755.0	5023.01320
		212	5000.0	4290.0	710.0	4835.92724
		312	6155.0	5180.0	975.0	5790.62607
		412	6590.0	5610.0	980.0	6217.20082
		Mean =	5743.8	4888.8	855.0	5466.69195

Innovotech Inc.

OMEX White Mold Trial -11-1507-462

Trial ID:	11-1507-462	Protocol ID:	11-1507-462
Location:	BROOKS, AB	Study Director:	MICHAEL HARDING
Project ID:		Investigator:	Dr. Michael Harding
		Sponsor Contact:	

Pest Type
D, Disease, G-BYRD7, G-DisStg = Disease, such as a fungus, bacteria, or virus
Pest Code
SCLESC, Sclerotinia sclerotiorum, = US
Crop Code
PHSSS, BVBE, Phaseolus sp., = US
Part Rated
SEEDLI = seedling
PLANT = plant
SEED = seed
C = Crop is Part Rated
Rating Type
EMERGE = emergence
PESSEV = pest severity
PESINC = pest incidence
YIELD = yield
DOCKAG = dockage
Rating Unit
NUMBER = number
0-4 = 0-4 index/scale
% = percent
g = gram

PLOT = total plot