WEED CONTROL IN PROCESSING VEGETABLES

RESEARCH RESULTS – 2009

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FOR THE ONTARIO PROCESSING VEGETABLE GROWERS

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Purpose Of This Booklet

This booklet is provided as a guide to the 2009 processing vegetable weed control research control plots. The experiments outlined in this booklet are located at Ridgetown Campus. We appreciate the funding, cooperation and assistance provided by the Ontario Processing Vegetable Growers and the Ontario Food Processors Association. As well, we would like to thank the chemical companies and their representatives, agextension personnel, and other research scientists for their ideas, plant material and herbicide samples that were used in these trials. Funding for the 2009 research program was provided by:

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We trust that the information provided by this research will further the science of weed control by assisting with the registration of herbicides through the minor use system. We also hope this information will be of use in the extension of proper herbicide recommendations, thereby enabling growers to achieve consistent, broad spectrum weed control with a minimum of crop damage.

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Trial 1: Tolerance of Lima Bean to Sandea

Objective: Determine the tolerance of lima bean to PRE and POST applications of Sandea.

Materials & Methods:

Crop: Lima bean
Variety: Improved Kingston — Planting date: May 26/09
Planting rate: 137826 seeds/ha — Depth: 4 cm
Row spacing: 75cm — Plant spacing: 9.5 cm

Design: Randomized Complete Block Design
Plot width: 1.5m — Plot length: 10m
Reps: 4

Field Preparation: Field was fertilized on May 23 with 18-18-18 at 300 kg/ha and 27-0-0 at 250 kg/ha.

Soil Description:
Sand: 45% — OM: 4.5% — Texture: Loam
Silt: 29% — pH: 7.3 — Soil: Watford/Brady
Clay: 26% — CEC 11

Application Information:

	A	B
Application Date:	May-28-2009	Jun-24-2009
Time of Day:	2:00 PM	7:17 PM
Application Method:	CO2 SPRAY	CO2 SPRAY
Application Timing:	PRE	1-2 TRI
Application Placement:	SOIL	FOLIAR
Air Temperature, Unit:	21.7 C	29.1 C
% Relative Humidity:	75	68
Wind Velocity, Unit:	4.5 KPH	2.2 KPH
Wind Direction:	SE	SW
Dew Presence (Y/N):	Y	N
Soil Temperature, Unit:	23 C	29 C
Soil Moisture:	MOIST	MOIST
% Cloud Cover:	100	10

Spray Equipment:

Application Method: CO2 Backpack — Pressure: 207 KPA (30 PSI)
Nozzle Type: Air Induction — Nozzle Size: ULD120-02
Nozzle Spacing: 50 cm (20”) — Boom Width: 1.5 m (60”)
Spray Volume: 200 L/ha (20 GAL/AC)

Table 1.1. Effect of herbicide treatment on lima bean visual injury 7, 14 and 28 days after application, dry weight at 28 days and yield.

HERBICIDE	RATE	VISUAL INJURY 7D	14D	28D	DRY WT G	YIELD T/AC
1. Check (WEEDFREE)		0C	0C	0A	163A	2.2A
2. SANDEA – PRE	26 G/AC	1C	1C	0A	160A	2.1A
3. SANDEA – PRE	52 G/AC	0C	1C	0A	124B	2.2A
4. SANDEA - POST	26 G/AC	9B	9B	3A	124C	2.1A
5. SANDEA – POST	52 G/AC	11A	15A	4A	101C	2.2A
LSD (P <0.05)		2	1	2	37	0.6

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Conclusions:

Conclusions: This trial was kept weed-free to test for the effect of preemergence and postemergence applications of Sandea (26 and 52 G/AC) on visual injury, height, dry weight and yields of lima bean.

Lima bean was tolerant to PRE applications of Sandea – no visual injury or yield reductions were measured, though plant dry weight was reduced by the 56 g/ac rate of Sandea.

POST applications of Sandea caused commercially unacceptable visual injury, and reduced height of lima bean. However, yields were not less than the untreated check in either POST treatment.

Trial 2: Tolerance of Lima Bean to Prowl H20

Objective: Determine the tolerance of lima bean to PRE and POST applications of Sandea.

Materials & Methods:

Crop: Lima bean
Variety: Improved Kingston — Planting date: May 26/09
Planting rate: 137826 seeds/ha — Depth: 4 cm
Row spacing: 75cm — Plant spacing: 9.5 cm

Design: Randomized Complete Block Design
Plot width: 1.5m — Plot length: 10m
Reps: 4

Field Preparation: Field was fertilized on May 23 with 18-18-18 at 300 kg/ha and 27-0-0 at 250 kg/ha.

Soil Description:
Sand: 45% — OM: 4.5% — Texture: Loam
Silt: 29% — pH: 7.3 — Soil: Watford/Brady
Clay: 26% — CEC 11

Application Information:

	A
Application Date:	May-25-2009
Time of Day:	6:00 PM
Application Method:	CO2 SPRAY
Application Timing:	PPI
Application Placement:	SOIL
Air Temperature, Unit:	22.6 C
% Relative Humidity:	40
Wind Velocity, Unit:	8.2 KPH
Wind Direction:	SE
Dew Presence (Y/N):	Y
Soil Temperature, Unit:	23 C
Soil Moisture:	MOIST
% Cloud Cover:	25

Spray Equipment:

Application Method: CO2 Backpack — Pressure: 207 KPA (30 PSI)
Nozzle Type: Air Induction — Nozzle Size: ULD120-02
Nozzle Spacing: 50 cm (20”) — Boom Width: 1.5 m (60”)
Spray Volume: 200 L/ha (20 GAL/AC)

Table 2.1. Effect of herbicide treatment on lima bean visual injury 7, 14 and 28 days after application, dry weight at 28 days and yield.

HERBICIDE	RATE	VISUAL INJURY			DRY WT	YIELD
		7D	14D	28D	G	T/AC
1. Check (WEEDFREE)		0A	0A	0A	40A	1.9A
2. PROWL H20	1000 ML/AC	0A	2A	0A	42A	1.8A
3. PROWL H20	2000 ML/AC	0A	0A	0A	41A	2.0A
LSD (P <0.05)		0	3	0	20	0.4

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Conclusions:

This trial was kept weed-free to test for the effect of pre-plant incorporated applications of Prowl H20 on visual injury, height, dry weight and yields of lima bean.

None of the treatments caused commercially unacceptable visual injury. Dry weight, height and yield were not less in any of the herbicide treatments compared with the untreated check.

Trial 3: Tolerance of Snap Bean to Sandea

Objective: Determine the tolerance of snap bean to PRE and POST applications of Sandea.

Materials & Methods:

Crop: Snap bean
Variety: Matador
Planting date: May 26/09
Planting rate: 360333 seeds/ha
Depth: 4 cm
Row spacing: 75cm
Plant spacing: 3.6 cm

Design: Randomized Complete Block Design
Plot width: 1.5m
Plot length: 10m
Reps: 4

Field Preparation: Field was fertilized on May 25 with 6-27-27 at 8 kg/ha and 26-0-0 at 32 kg/ha.

Soil Description:
Sand: 78%
OM: 4.4%
Texture: v. fine sandy loam
Silt: 14%
pH: 5.9
Soil: Watford/Brady
Clay: 8%
CEC 12

Application Information:

	A	B
Application Date:	May-28-2009	Jun-24-2009
Time of Day:	2:00 PM	7:17 PM
Application Method:	CO2 SPRAY	CO2 SPRAY
Application Timing:	PRE	1-2 TRI
Application Placement:	SOIL	FOLIAR
Air Temperature, Unit:	21.7 C	29.1 C
% Relative Humidity:	75	68
Wind Velocity, Unit:	4.5 KPH	2.2 KPH
Wind Direction:	SE	SW
Dew Presence (Y/N):	Y	N
Soil Temperature, Unit:	23 C	29 C
Soil Moisture:	MOIST	MOIST
% Cloud Cover:	100	10

Spray Equipment:

Application Method: CO2 Backpack
Pressure: 207 KPA (30 PSI)
Nozzle Type: Air Induction
Nozzle Size: ULD120-02
Nozzle Spacing: 50 cm (20”)
Boom Width: 1.5 m (60”)
Spray Volume: 200 L/ha (20 GAL/AC)

Table 3.1. Effect of herbicide treatment on snap bean visual injury 7, 14 and 28 days after application, dry weight at 28 days and yield.

HERBICIDE	RATE	VISUAL INJURY			DRY WT	YIELD
		7D	14D	28D	G	T/AC
1. Check (WEEDFREE)		0B	0A	0A	133AB	8.6AB
2. SANDEA – PRE	26 G/AC	1AB	0A	1A	141AB	8.3AB
3. SANDEA – PRE	52 G/AC	1AB	1A	2A	154A	7.3AB
4. SANDEA - POST	26 G/AC	3AB	0A	0A	114B	7.5AB
5. SANDEA – POST	52 G/AC	5A	1A	1A	125AB	7.1B
LSD (P <0.05)		4	2	3	33	1.4

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Conclusions:

Conclusions: This trial was kept weed-free to test for the effect of preemergence and postemergence applications of Sandea (26 and 52 G/AC) on visual injury, height, dry weight and yields of snap bean.

Snap bean showed temporary chlorosis and reductions in dry weight following POST applications of Sandea. Snap bean yield was reduced at the 52 g/ac rate of Sandea.

Trial 4: Tolerance of Snap Bean to Prowl H20

Objective: Determine the tolerance of lima bean to PPI applications of Prowl H20.

Materials & Methods:

Crop: Lima bean
Variety: Improved Kingston — Planting date: June 3/08
Planting rate: 137826 seeds/ha — Depth: 4 cm
Row spacing: 75cm — Plant spacing: 9.5 cm

Design: Randomized Complete Block Design
Plot width: 1.5m — Plot length: 10m
Reps: 4

Field Preparation: Field was fertilized on May 23 with 18-18-18 at 300 kg/ha and 27-0-0 at 250 kg/ha.

Soil Description:

Sand: 45%	OM: 4.5%	Texture: Loam
Silt: 29%	pH: 7.3	Soil: Watford/Brady
Clay: 26%	CEC 11	

Application Information:

	A
Application Date:	Jun-3-2008
Time of Day:	7:30 AM
Application Method:	CO2 SPRAY
Application Timing:	PPI
Application Placement:	SOIL
Air Temperature, Unit:	16.3 C
% Relative Humidity:	100
Wind Velocity, Unit:	4.3 KPH
Wind Direction:	SE
Dew Presence (Y/N):	Y yes
Soil Temperature, Unit:	18.5 C
Soil Moisture:	MOIST
% Cloud Cover:	95

Spray Equipment:

Application Method: CO2 Backpack — Pressure: 207 KPA (30 PSI)
Nozzle Type: Air Induction — Nozzle Size: ULD120-02
Nozzle Spacing: 50 cm (20”) — Boom Width: 1.5 m (60”)
Spray Volume: 200 L/ha (20 GAL/AC)

Table 4.1. Effect of herbicide treatment on lima bean visual injury 7, 14 and 28 days after application, dry weight at 28 days and yield.

HERBICIDE	RATE	VISUAL INJURY			DRY WT	YIELD
		7D	14D	28D	G	T/AC
1. Check (WEEDFREE)		0A	0A	0A	133A	9.0A
2. PROWL H20	1000 ML/AC	0A	1A	1A	130A	9.4A
3. PROWL H20	2000 ML/AC	1A	1A	1A	136A	8.8A
LSD (P <0.05)		0	1	2	11	1.8

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Conclusions:

This trial was kept weed-free to test for the effect of pre-plant incorporated applications of Prowl H20 on visual injury, height, dry weight and yields of snap bean.

Prowl H20 did not injure snap bean, or reduce dry weight, height or yield of snap bean.

Trial 5: Herbicide Tolerance in Carrots

Objective: Determine the tolerance of carrots to preemergence applications of Dual II Magnum, Goal, Prowl H20 and Command.

Materials & Methods:

Crop: Carrot
Variety: Fontana
Planting date: April 28/09
Planting rate: 260000 seeds/ha
Depth: 2 cm
Row spacing: 75cm

Design: Randomized Complete Block Design
Plot width: 1.5m
Plot length: 10m
Reps: 4

Field Preparation: Fertilized with 350 hg/ha of 19-19-19 and 200 kg/ha of 27-0-0. Back half of plots were kept weed-free by hand.

Soil Description:

Sand: 49%	OM: 9.2%	Texture: Loam
Silt: 34%	pH: 7.2	Soil: Watford/Brady
Clay: 17%	CEC 20	

Application Information:

	A
APPLICATION DATE	MAY 6
TIME OF DAY	8:00AM
TIMING	PRE
AIR TEMP (c)	24
RH (%)	53
WIND SPEED (KPH)	0
SOIL TEMP (c)	24
CLOUD COVER (%)	100
CROP STAGE	PRE

Spray Equipment:

Application Method: CO2 Backpack
Pressure: 207 KPA (30 PSI)
Nozzle Type: AIR INDUCTION
Nozzle Size: ULD120-02
Nozzle Spacing: 50 cm (20”)
Boom Width: 1.5 m (60”)
Spray Volume: 200 L/ha (20 GAL/AC)

Table 5.1. Effect of herbicide treatment on 'Fontana' carrot visual injury 7, 14 and 28 days after application, stand count, carrot length and yield.

HERBICIDE	RATE	VISUAL INJURY 7D	VISUAL INJURY 14D	VISUAL INJURY 28D	LENGTH CM	YIELD T/AC
1. Check (WEEDFREE)		0B	0A	0A	13A	29A
2. DUAL II MAG	400 ML/AC	0B	0A	0A	13A	35A
3. DUAL II MAG	800 ML/AC	3B	8A	8A	13A	31A
4. DUAL II MAG	1200 ML/AC	3B	5A	5A	12A	39A
5. GOAL	200 ML/AC	0B	3A	3A	13A	39A
6. GOAL	400 ML/AC	3B	3A	3A	14A	32A
7. PROWL H20	1.5 L/AC	3B	3A	3A	15A	34A
8. PROWL H20	3.0 L/AC	4B	4A	4A	14A	37A
9. COMMAND	210 ML/AC	0B	0A	0A	13A	29A
10. COMMAND	420 ML/AC	6AB	5A	5A	13A	38A
11. COMMAND	840 ML/AC	14A	6A	5A	13A	38A
LSD (P <0.05)		10	9	9	3	21

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Conclusions:

This trial was kept weed-free to test for the effect of preemergence and applications of Dual II Magnum, Goal, Prowl H20 and Command on carrot visual injury, carrot length and yield of 'Fontana' carrot.

Injury was observed in all treatments, but was less than 10% in all cases except the 840 ml/ac rate of Command. Despite this injury, carrot length and yield were not reduced by any herbicide treatments. Similar results were observed in 2008, indicating good tolerance of carrot to all herbicide treatments.

Trial 6: Tolerance of Cole Crops to Kixor (saflufenacil)

Objective: Determine the tolerance of broccoli to PRE-T applications of Kixor (saflufenacil).

Materials & Methods:

Crop: Broccoli
Variety: Iron Man — Planting date: Jun 3/09
Planting rate: 29167 plants/ha — Depth: 5 cm
Row spacing: 45cm

Crop: Cabbage
Variety: Blue Dynasty — Planting date: Jun 3/09
Planting rate: 14850 plants/ha — Depth: 5 cm
Row spacing: 45cm

Crop: Cauliflower
Variety: Apex — Planting date: Jun 3/09
Planting rate: 14850 plants/ha — Depth: 5 cm
Row spacing: 45cm

Design: Randomized Complete Block Design
Plot width: 1.5m — Plot length: 10m
Reps: 4

Field Preparation: May 5, 2009 applied 22 kg/ha of actual N of 6-24-24 and 135 kg//ha of actual N of 46-0-0. Fertilizer incorporated with S-tine cultivator

Soil Description:
Sand: 58% — OM: 3.2% — Texture: v. fine sandy loam
Silt:24% — pH: 6.9 — Soil: Watford/Brady
Clay: 18% — CEC 15

Application Information:

	A
APPLICATION DATE	Jun 2
TIME OF DAY	6:40 AM
TIMING	PRE-T
AIR TEMP (c)	18
RH (%)	63
WIND SPEED (KPH)	3
SOIL TEMP (c)	20
CLOUD COVER (%)	65
CROP STAGE	PRE-T

Spray Equipment:

Application Method: CO2 Backpack — Pressure: 207 KPA (30 PSI)
Nozzle Type: AIR INDUCTION — Nozzle Size: ULD120-02
Nozzle Spacing: 50 cm (20”) — Boom Width: 1.5 m (60”)
Spray Volume: 200 L/ha (20 GAL/AC)

Table 6.1. Effect of cole crop and Kixor rate on broccoli, cabbage and cauliflower visual injury, dry weight and yield.

CROP	RATE (ML/AC)	VISUAL INJURY 7D	14D	28D	DRY WT (G)	YIELD T/AC
1. BROCCOLI	0	0B	0B	0C	204A	3.7AB
2. BROCCOLI	58	0B	0B	0C	207B	3.2B
3. BROCCOLI	116	0B	1B	1C	208B	3.5AB
4. BROCCOLI	232	1AB	1B	3BC	195A	3.9A
5. CABBAGE	0	0B	0B	0C	272A	11.1A
6. CABBAGE	58	0B	0B	3BC	242A	10.0A
7. CABBAGE	116	0B	3AB	6AB	245A	10.7A
8. CABBAGE	232	0B	4A	9A	261A	11.5A
9. CAULIFLOWER	0	0B	0B	0C	178A	4.0A
10. CAULIFLOWER	58	1AB	2B	3BC	158AB	3.1B
11. CAULIFLOWER	116	2A	5A	6AB	120B	3.3A
12. CAULIFLOWER	232	2A	5A	7A	133AB	3.6A
LSD (P <0.05)		1	2	3	52	3.5

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Conclusions:

Conclusions: This trial was kept weed-free to determine the tolerance of broccoli to pre-transplant applications of Kixor (saflufenacil). This is a new soybean herbicide that has residual activity on many common broadleaf weeds, including lamb's-quarters and redroot pigweed. We tested the herbicide at rates of 58, 116 and 232 ml/ac (25, 50 and 100 g a/ha), representing 1X, 2X and 4X the proposed label rate in soybean

Though we observed visual injury – which included leaf distortion, stunting and some leaf chlorosis – this was all outgrown by the end of the season in 2009. There was no reduction in head size or yield in this trial. In previous years however, we have measured reductions in growth and yield at the 232 ml/ac rate. Further research is warranted, as we have only tested a single variety for each cole crop, and do not have adequate information across a range of soil types and environments to determine the full range of tolerance to Kixor.

Trial 7: Tolerance of Processing Peas to PPI Herbicides

Objective: Determine weed control and tolerance of processing pea to PPI applications of Kixor (saflufenacil), Prowl H20, Valtera (flumioxazin), Sandea, and pyroxasulfone.

Materials & Methods:

Crop: Pea
Variety: Spring
Planting date: Apr 22
Planting rate: 300 kg/ha
Depth: 5 cm
Row spacing: 18cm

Design: Randomized Complete Block Design
Plot width: 1.5m
Plot length: 10m
Reps: 4

Field Preparation: Worked the field twice with S-tine cultivator prior to planting. 38 kg/ha of actual N (19-19-19) was applied to the area and worked in with the S-tine cultivator on April 21, 2009.

Soil Description:
Sand: 29%
OM: 6.0%
Texture: Clay Loam
Silt:36%
pH: 6.9
Soil: WATFORD/BRADY
Clay: 35%
CEC 15

Application Information:

	A
APPLICATION DATE	APR 22
TIME OF DAY	7:15AM
TIMING	PPI
AIR TEMP (c)	12
RH (%)	91
WIND SPEED (KPH)	6
SOIL TEMP (c)	13
CLOUD COVER (%)	0
CROP STAGE	PPI

Spray Equipment:

Application Method: CO2 Backpack
Pressure: 207 KPA (30 PSI)
Nozzle Type: AIR INDUCTION
Nozzle Size: ULD120-02
Nozzle Spacing: 50 cm (20”)
Boom Width: 1.5 m (60”)
Spray Volume: 200 L/ha (20 GAL/AC)

Table 7.1. Effect of herbicide treatment on 'Spring' pea visual injury 7, 14 and 28 days after emergence.

HERBICIDE	RATE	VISUAL INJURY		
		7D	14D	28D
1. Check (WEEDFREE)		0C	0B	0C
2. KIXOR	58 ML/AC	4B	2B	12B
3. KIXOR	116 ML/AC	9A	10A	28A
4. PROWL H20	1500 ML/AC	0C	0B	0C
5. PROWL H20	3000 ML/AC	0C	0B	0C
6. VALTERA	70 GA/HA	1C	0B	2C
7. VALTERA	140 GA/HA	1C	1B	2C
8. SANDEA	25 G/AC	1C	2B	4C
9. SANDEA	50 G/AC	1C	1B	2C
10. PYROXASULFONE	100 G/AC	0C	0B	0C
11. PYROXASULFONE	200 G/AC	0C	1B	2C
12. DUAL II MAGNUM	500 ML/AC	0C	1B	1C
LSD (P <0.05)		2	2	5

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Table 7.2. Effect of herbicide treatment on redroot pigweed (AMARE), common lamb's-quarters and green foxtail (SETVI) control 42 days after application.

HERBICIDE	RATE	AMARE	CHEAL	SETVI
1. Check (WEEDFREE)		0B	0D	0D
2. KIXOR	58 ML/AC	100A	93A	15CD
3. KIXOR	116 ML/AC	98A	93A	65AB
4. PROWL H20	1500 ML/AC	95A	21CD	93A
5. PROWL H20	3000 ML/AC	100A	89A	100A
6. VALTERA	70 GA/HA	96A	71AB	53ABC
7. VALTERA	140 GA/HA	100A	85A	62AB
8. SANDEA	25 G/AC	99A	76AB	18CD
9. SANDEA	50 G/AC	100A	88A	36BCD
10. PYROXASULFONE	100 G/AC	100A	67AB	98A
11. PYROXASULFONE	200 G/AC	100A	97A	100A
12. DUAL II MAGNUM	500 ML/AC	97A	40BC	98A
LSD (P <0.05)		5	29	32

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Table 7.3. Effect of herbicide treatment on 'Spring' pea tenderness and yield.

HERBICIDE	RATE	TENDEROMETER READING (PSI)	YIELD T/AC
1. Check (WEEDFREE)		89A	1.8A
2. KIXOR	58 ML/AC	87A	1.7AB
3. KIXOR	116 ML/AC	86A	0.8B
4. PROWL H20	1500 ML/AC	89A	1.7AB
5. PROWL H20	3000 ML/AC	89A	2.7A
6. VALTERA	70 GA/HA	90A	1.9A
7. VALTERA	140 GA/HA	93A	1.8A
8. SANDEA	25 G/AC	88A	1.6AB
9. SANDEA	50 G/AC	90A	1.9A
10. PYROXASULFONE	100 G/AC	92A	1.9A
11. PYROXASULFONE	200 G/AC	95A	2.2A
12. DUAL II MAGNUM	500 ML/AC	89A	2.1A
LSD (P <0.05)		8	0.7

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Conclusions:

This trial was established to determine the influence of Kixor, Prowl H20, Valtera, Sandea, and pyroxasulfone applied pre-plant incorporated on pea visual injury, tenderness, yield, and weed control. Kixor caused significant injury and reduced pea yield, but did not affect pea maturity. None of the other herbicide treatments injured pea.

Kixor gave excellent control of velvetleaf, redroot pigweed, common ragweed, common lamb's-quarters, lady's thumb, and poor control of barnyardgrass and green foxtail. Prowl H20 gave excellent control of redroot pigweed, good control of green foxtail, fair control of barnyardgrass, and poor control of velvetleaf, common lamb's-quarters, common ragweed and lady's thumb. Valtera gave excellent control of redroot pigweed, fair control of common lamb's-quarters and lady's thumb, and poor control of velvetleaf, common ragweed, barnyardgrass and green foxtail. Sandea gave excellent control of redroot pigweed and common ragweed, good control of velvetleaf and lady's thumb, fair control of common lamb's-quarters and poor control of barnyardgrass and green foxtail. Pyroxasulfone gave excellent control of redroot pigweed, barnyardgrass and green foxtail, good control of velvetleaf and lady's thumb, fair control of common ragweed and poor control of common lamb's-quarters.

Trial 8: Tolerance of Processing Peas to PRE Herbicides

Objective: Determine weed control and tolerance of processing pea to PRE applications of Kixor, Prowl H20, Valtera, Sandea, and pyroxasulfone.

Materials & Methods:

Crop: Pea
Variety: Spring
Planting rate: 300 kg/ha
Row spacing: 18cm
Planting date: Apr 22
Depth: 5 cm

Design: Randomized Complete Block Design
Plot width: 1.5m
Reps: 4
Plot length: 10m

Field Preparation: Worked the field twice with S-tine cultivator prior to planting. 38 kg/ha of actual N (19-19-19) was applied to the area and worked in with the S-tine cultivator on April 21, 2008.

Soil Description:
Sand: 29%
Silt:36%
Clay: 35%
OM: 6.0%
pH: 6.9
CEC 15
Texture: Clay Loam
Soil: WATFORD/BRADY

Application Information:

	A
APPLICATION DATE	APR 22
TIME OF DAY	7:15AM
TIMING	PRE
AIR TEMP (c)	12
RH (%)	91
WIND SPEED (KPH)	6
SOIL TEMP (c)	13
CLOUD COVER (%)	0
CROP STAGE	PRE

Spray Equipment:

Application Method: CO2 Backpack
Nozzle Type: AIR INDUCTION
Nozzle Spacing: 50 cm (20”)
Spray Volume: 200 L/ha (20 GAL/AC)
Pressure: 207 KPA (30 PSI)
Nozzle Size: ULD120-02
Boom Width: 1.5 m (60”)

Table 8.1. Effect of herbicide treatment on 'Spring' pea visual injury 7, 14 and 28 days after emergence.

HERBICIDE	RATE	VISUAL INJURY		
		7D	14D	28D
1. Check (WEEDFREE)		0B	0C	0B
2. KIXOR	58 ML/AC	5B	15ABC	35A
3. KIXOR	116 ML/AC	19A	23A	36A
4. PROWL H20	1500 ML/AC	2B	4BC	4B
5. PROWL H20	3000 ML/AC	2B	4BC	10B
6. VALTERA	70 GA/HA	8B	14ABC	16AB
7. VALTERA	140 GA/HA	17A	18AB	28AB
8. SANDEA	25 G/AC	1B	4BC	5B
9. SANDEA	50 G/AC	4B	5BC	8B
10. PYROXASULFONE	100 G/AC	1B	5BC	8B
11. PYROXASULFONE	200 G/AC	1B	5BC	6B
12. DUAL II MAGNUM	500 ML/AC	1B	0C	1B
LSD (P <0.05)		7	9	18

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Table 8.2. Effect of herbicide treatment on redroot pigweed (AMARE), and common lamb's-quarters control 42 days after application.

HERBICIDE	RATE	AMARE	CHEAL
1. Check (WEEDFREE)		0B	0D
2. KIXOR	58 ML/AC	100A	94A
3. KIXOR	116 ML/AC	100A	98A
4. PROWL H20	1500 ML/AC	88A	43BC
5. PROWL H20	3000 ML/AC	91A	76AB
6. VALTERA	70 GA/HA	100A	80A
7. VALTERA	140 GA/HA	100A	90A
8. SANDEA	25 G/AC	100A	73AB
9. SANDEA	50 G/AC	100A	71AB
10. PYROXASULFONE	100 G/AC	100A	63AB
11. PYROXASULFONE	200 G/AC	100A	85A
12. DUAL II MAGNUM	500 ML/AC	93A	26C
LSD (P <0.05)		9	25

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Table 8.3. Effect of herbicide treatment on 'Spring' pea tenderness and yield.

HERBICIDE	RATE	TENDEROMETER READING (PSI)	YIELD T/AC
1. Check (WEEDFREE)		92A	2.2A
2. KIXOR	58 ML/AC	84A	1.8A
3. KIXOR	116 ML/AC	86A	1.5A
4. PROWL H20	1500 ML/AC	87A	2.4A
5. PROWL H20	3000 ML/AC	83A	2.5A
6. VALTERA	70 GA/HA	86A	1.8A
7. VALTERA	140 GA/HA	83A	1.6A
8. SANDEA	25 G/AC	89A	2.3A
9. SANDEA	50 G/AC	86A	1.7A
10. PYROXASULFONE	100 G/AC	87A	2.2A
11. PYROXASULFONE	200 G/AC	87A	2.4A
12. DUAL II MAGNUM	500 ML/AC	92A	2.2A
LSD (P <0.05)		9	0.8

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Conclusions:

This trial was established to determine the influence of Kixor, Prowl H20, Valtera, Sandea, and pyroxasulfone applied preemergence on pea visual injury, tenderness, yield, and weed control. Kixor applied PRE injured pea and reduced yield, but did not delay pea maturity. Valtera injured pea and resulted in a trend toward reduced yield, but did not delay pea maturity. Pea was not injured by Prowl H20, Sandea or pyroxasulfone, yield was not reduced and maturity was not delayed.

Kixor gave excellent control of velvetleaf, redroot pigweed, common ragweed, common lamb's-quarters, lady's thumb, and poor control of barnyardgrass. Prowl H20 gave good control of redroot pigweed, and poor control of velvetleaf, common ragweed, common lamb's-quarters, lady's thumb, and barnyardgrass. Valtera gave excellent control of redroot pigweed, good control of velvetleaf and common lamb's-quarters, fair control of common ragweed and lady's thumb, and poor control of barnyardgrass. Sandea gave excellent control of redroot pigweed, good control of velvetleaf, fair control of common ragweed and common lamb's-quarters and poor control of barnyardgrass. Pyroxasulfone gave excellent control of redroot pigweed, good control of velvetleaf, and poor control of common ragweed, common lamb's-quarters, and barnyardgrass.

Trial 9: Tolerance of Transplanted Pepper to Kixor (saflufenacil)

Objective: Determine weed control and tolerance of processing pea to pre-transplant applications of saflufenacil.

Materials & Methods:

Crop: Pepper
Variety: Red Knight
Planting rate: 29167 plants/ha
Row spacing: 45cm
Planting date: June 5/09
Depth: 5 cm

Design: Randomized Complete Block Design
Plot width: 1.5m
Reps: 4
Plot length: 10m

Field Preparation: May 29, 2009 – applied 65 kg/ha of actual N of 10-26-26 and 25 kg/ha of 46-0-0. Fertilizer incorporated with S-tine cultivator.

Soil Description:
Sand: 50%
Silt: 26%
Clay: 24%
OM: 3.8%
pH: 6.9
CEC 17
Texture: sandy clay loam
Soil: Watford/Brady Series

Application Information:

	A
APPLICATION DATE	JUN 13
TIME OF DAY	6:40 AM
TIMING	PRE-T
AIR TEMP (c)	15
RH (%)	76
WIND SPEED (KPH)	5
SOIL TEMP (c)	21
CLOUD COVER (%)	100

Spray Equipment:

Application Method: CO2 Backpack
Nozzle Type: AIR INDUCTION
Nozzle Spacing: 50 cm (20”)
Spray Volume: 200 L/ha (20 GAL/AC)
Pressure: 207 KPA (30 PSI)
Nozzle Size: ULD120-02
Boom Width: 1.5 m (60”)

Table 9.1. Effect of herbicide treatment on pepper visual injury 7, 14 and 28 days after treatment, and dry weight 28 days after treatment.

HERBICIDE	RATE	VISUAL INJURY			DRY WT
		7D	14D	28D	G
1. Check (WEEDFREE)		0C	0B	0B	9.2A
2. KIXOR	25 GA/HA	3BC	5B	19B	2.4B
3. KIXOR	50 GA/HA	6B	12B	53A	1.7B
4. KIXOR	100 GA/HA	11A	38A	73A	0.9B
LSD (P <0.05)		3	18	20	2.0

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Table 9.2. Effect of herbicide treatment on pepper fruit size and yield.

HERBICIDE	RATE	FRUIT SIZE	YIELD
		G	T/AC
1. Check (WEEDFREE)		98A	15.7A
2. KIXOR	25 GA/HA	71A	3.3B
3. KIXOR	50 GA/HA	85A	1.2B
4. KIXOR	100 GA/HA	25B	0.1B
LSD (P <0.05)		36	3.7

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Conclusions:

This trial was kept weed-free to examine the tolerance of transplanted pepper to pre-transplant applications of Kixor (saflufenacil), a new herbicide registered for use in soybean and corn by BASF.

There was significant injury at all rates of Kixor (saflufenacil), and the injury became progressively worse as the season went on. Kixor (saflufenacil) caused reductions in dry weight and yield of pepper at all rates tested.

Trial 10: Tolerance of pepper to preemergence herbicides

Objectives: Determine the tolerance of peppers to PRE-T applications of Valtera, Prowl H20, and Sandea.

Materials & Methods:

Crop: Pepper
Variety: Red Knight — Planting date: June 5/09
Planting rate: 29167 plants/ha — Depth: 5 cm
Row spacing: 45cm

Design: Randomized Complete Block Design
Plot width: 1.5m — Plot length: 10m
Reps: 4

Field Preparation: May 27, 2009 – applied 21 kg/ha of actual N of 10-26-26 and 170 kg/ha of actual P of 0-46-0. Fertilizer incorporated with S-tine cultivator. Cover spray of s-metolachlor/benoxacor at 1200 g ai/ha applied PRE-T on June 1, 2008.

Soil Description:

Sand: 58%	OM: 3.2%	Texture: v. fine sandy loam
Silt: 24%	pH: 6.9	Soil: Watford/Brady Series
Clay: 18%	CEC 15	

Application Information:

	A
APPLICATION DATE	June 2
TIME OF DAY	5:20PM
TIMING	PRE-T
AIR TEMP (c)	15
RH (%)	76
WIND SPEED (KPH)	5
SOIL TEMP (c)	21
CLOUD COVER (%)	100
CROP STAGE	PRE-T

Spray Equipment:

Application Method: CO2 Backpack — Pressure: 207 KPA (30 PSI)
Nozzle Type: AIR INDUCTION — Nozzle Size: ULD120-02
Nozzle Spacing: 50 cm (20”) — Boom Width: 1.5 m (60”)
Spray Volume: 200 L/ha (20 GAL/AC)

Table 10.1. Effect of herbicide treatment on pepper visual injury 7, 14 and 28 days after planting, and height 28 days after planting.

HERBICIDE	RATE	VISUAL INJURY 7D	14D	28D	HEIGHT CM
1. UNTREATED CHECK		0E	0C	0E	9.0A
2. VALTERA	35 GA/HA	2B-E	2BC	4CD	8.7AB
3. VALTERA	70 GA/HA	2B-E	5A	6C	7.9A-D
4. VALTERA	140 GA/HA	3BC	5A	17A	7.5CD
5. PROWL H20	1 L/AC	1C-E	1C	1DE	8.8AB
6. PROWL H20	2 L/AC	1DE	1C	1E	8.2A-D
7. SANDEA	25 G/AC	3B	2BC	4CD	7.7B-D
8. SANDEA	50 G/AC	5A	4AB	10B	7.2D
9. DUAL II MAGNUM	500 ML/AC	2B-D	1C	1E	8.6A-C
LSD (P <0.05)		2	2	3	1.1

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Table 10.2. Effect of herbicide treatment on pepper visual injury 7, 14 and 28 days after planting, and height 28 days after planting.

HERBICIDE	RATE	FRUIT WEIGHT G	YIELD T/AC
1. UNTREATED CHECK		100AB	4.7A
2. VALTERA	35 GA/HA	118A	4.6A
3. VALTERA	70 GA/HA	109AB	5.0A
4. VALTERA	140 GA/HA	94B	2.9B
5. PROWL H20	1 L/AC	105AB	4.9A
6. PROWL H20	2 L/AC	103AB	4.9A
7. SANDEA	25 G/AC	108AB	4.0AB
8. SANDEA	50 G/AC	105AB	2.5B
9. DUAL II MAGNUM	400 ML/AC	105AB	4.6A
LSD (P <0.05)		19	1.9

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Conclusions:

This trial was established to determine tolerance of transplanted pepper to pre-transplant (PRE) applications of Valtera, Prowl H20, and Sandea. Treatments were compared to an untreated check and an industry standard of Dual II Magnum (0.4 l/ac)

Visual injury was observed at the high rate of Valtera and the high rate of Sandea. Plant height and yield were correspondingly reduced in these treatments. Prowl H20 did not injure pepper, nor did it cause a reduction in pepper height or yield.

Trial 11: Tolerance of Transplanted Pepper to Preemergence Applications of Reflex

Objective: Determine weed control and tolerance of pepper to PRE applications of Reflex.

Materials & Methods:

Crop: Pepper
Variety: Red Knight
Planting rate: 29167 plants/ha
Row spacing: 45cm
Planting date: June 5/09
Depth: 5 cm

Design: Randomized Complete Block Design
Plot width: 1.5m
Reps: 4
Plot length: 10m

Field Preparation: May 27, 2009 – applied 21 kg/ha of actual N of 10-26-26 and 170 kg/ha of actual P of 0-46-0. Fertilizer incorporated with S-tine cultivator. Cover spray of s-metolachlor/benoxacor at 1200 g ai/ha applied PRE-T on June 1, 2008.

Soil Description:
Sand: 58%
Silt: 24%
Clay: 18%
OM: 3.2%
pH: 6.9
CEC 15
Texture: v. fine sandy loam
Soil: Watford/Brady Series

Application Information:

	A
APPLICATION DATE	June 2
TIME OF DAY	5:20PM
TIMING	PRE-T
AIR TEMP (c)	15
RH (%)	76
WIND SPEED (KPH)	5
SOIL TEMP (c)	21
CLOUD COVER (%)	100
CROP STAGE	PRE-T

Spray Equipment:

Application Method: CO2 Backpack
Nozzle Type: AIR INDUCTION
Nozzle Spacing: 50 cm (20”)
Spray Volume: 200 L/ha (20 GAL/AC)
Pressure: 207 KPA (30 PSI)
Nozzle Size: ULD120-02
Boom Width: 1.5 m (60”)

Table 11.1. Effect of herbicide treatment on 'Socrates' pepper visual injury 7, 14 and 28 days after treatment, and height 21 days after treatment.

HERBICIDE	RATE	VISUAL INJURY			HEIGHT
		7D	14D	28D	CM
1. Check (WEEDFREE)		0A	0A	0A	9A
2. REFLEX	400 ML/AC	1A	0A	0A	9A
3. REFLEX	800 ML/AC	1A	1A	0A	9A
LSD (P <0.05)		1	1	0	1

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Table 11.2. Effect of herbicide treatment on 'Socrates' pepper fruit size and yield.

HERBICIDE	RATE	FRUIT SIZE	YIELD
		G	T/AC
1. Check (WEEDFREE)		108A	6.5A
2. REFLEX	400 ML/AC	117A	6.8A
3. REFLEX	800 ML/AC	120A	6.9A
LSD (P <0.05)		17	1.9

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Conclusions:

One half of this trial was kept weed-free to examine the tolerance of transplanted pepper to preemergence applications of Reflex, while the other half was not hand-weeded to determine the efficacy of preemergence Reflex at 400 and 800 ml/ac

PRE applications of Reflex did not injure pepper and did not cause a reduction in pepper fruit size or yield.

PRE applications of Reflex gave excellent control of purslane, fair control of redroot pigweed and poor control of common ragweed, wild buckwheat, lady's thumb, and eastern black nightshade.

Trial 12: Comparison of Full, Split and Micro-rates of Pyramin+Upbeet in Red Beets

Objectives: 1. Determine weed control and tolerance of red beet to full, split and micro-rate applications of Pyramin+Upbeet.

2. Compare weed control and tolerance of red beet to full, split and micro-rate applications of Pyramin+Upbeet Pyramin with and without Dual II Magnum.

Materials & Methods:

Crop: Red beet
Variety: Detroit Supreme Planting date: June 9
Planting rate: 265 684 seeds/ha Depth: 2 cm
Row spacing: 38cm

Design: Randomized Complete Block Design
Plot width: 1.5m Plot length: 10m
Reps: 4

Field Preparation: Fertilized on June 8 with 18-18-18 at 300 kg/ha and 27-0-0 at 250 kg/ha. Back halves of the plot were maintained weed free.

Soil Description:
Sand: 58% OM: 3.2% Texture: v. fine sandy loam
Silt: 24% pH: 6.9 Soil: Watford/Brady Series
Clay: 18% CEC 15

Application Information:

	A	B	C	D
APPLICATION DATE	JUN 10	JUN 15	JUN 22	JUN 29
TIME OF DAY	9:00AM	9:00AM	9:00AM	7:30AM
TIMING	PRE	POST1	POST2	POST3
AIR TEMP (c)	19	22	22	28
RH (%)	64	74	64	70
WIND SPEED (KPH)	2	1	2	4
SOIL TEMP (c)	24	22	20	27
CLOUD COVER (%)	90	0	10	10
CROP STAGE	PRE	COT	COT-2 LF	4 LF

Spray Equipment:

Application Method: CO2 Backpack Pressure: 207 KPA (30 PSI)
Nozzle Type: AIR INDUCTION Nozzle Size: ULD120-02
Nozzle Spacing: 50 cm (20”) Boom Width: 1.5 m (60”)
Spray Volume: 200 L/ha (20 GAL/AC)

Table 12.1 Red beet injury in full, split and micro-rate applications of Pyramin+Upbeet, with or without Dual II Magnum.

HERBICIDE			VISUAL INJURY		
			7D	14D	28D
1. Check (WEED-FREE)			0D	0D	0D
2. DUAL II MAGNUM	500 ML/AC	PRE	1D	1D	0D
3. DUAL II MAGNUM	500 ML/AC	PRE	1D	0D	1D
PYRAMIN	2000 ML/AC	POST1			
4. DUAL II MAGNUM	500 ML/AC	PRE	4D	1D	0D
PYRAMIN +	2000 ML/AC	POST1			
UPBEET	14.4 G/AC	POST1			
5. DUAL II MAGNUM	500 ML/AC	PRE	63A	83A	79A
PYRAMIN +	1000 ML/AC	POST12			
UPBEET	7.2 G/AC	POST12			
6. DUAL II MAGNUM	500 ML/AC	PRE	38B	46B	48B
PYRAMIN +	500 ML/AC	POST1234			
UPBEET	3.6 G/AC	POST1234			
7. PYRAMIN	2000 ML/AC	POST1	0D	0D	0D
8. PYRAMIN +	2000 ML/AC	POST1	0D	0D	0D
UPBEET	14.4 G/AC	POST1			
9. PYRAMIN +	1000 ML/AC	POST12	19C	24C	13C
UPBEET	7.2 G/AC	POST12			
10. PYRAMIN +	500 ML/AC	POST1234	8D	13CD	8CD
UPBEET	3.6 G/AC	POST1234			
LSD (P <0.05)			11	17	9

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Superspreader (1.5% v/v) was added to all treatments with Pyramin.

Table 12.2 Red beet yield in full, split and micro-rate applications of Pyramin+Upbeet, with or without Dual II Magnum.

HERBICIDE			YIELD (T/AC)		
			NO1	NO2	NO3
1. Check (WEED-FREE)			2.7CD	5.7A	7.9A-D
2. DUAL II MAGNUM	500 ML/AC	PRE	3.0BC	5.1A	10.8AB
3. DUAL II MAGNUM	500 ML/AC	PRE	3.7AC	5.1A	6.2CD
PYRAMIN	2000 ML/AC	POST1			
4. DUAL II MAGNUM	500 ML/AC	PRE	3.1AC	5.1A	7.4BCD
PYRAMIN +	2000 ML/AC	POST1			
UPBEET	14.4 G/AC	POST1			
5. DUAL II MAGNUM	500 ML/AC	PRE	0.3F	0.5D	5.5D
PYRAMIN +	1000 ML/AC	POST12			
UPBEET	7.2 G/AC	POST12			
6. DUAL II MAGNUM	500 ML/AC	PRE	1.3EF	2.0CD	10.0ABC
PYRAMIN +	500 ML/AC	POST1234			
UPBEET	3.6 G/AC	POST1234			
7. PYRAMIN	2000 ML/AC	POST1	4.2A	5.2A	6.3CD
8. PYRAMIN +	2000 ML/AC	POST1	3.9AB	4.5AB	7.8A-D
UPBEET	14.4 G/AC	POST1			
9. PYRAMIN +	1000 ML/AC	POST12	1.8DE	2.9BC	2.8AB 11.8A
UPBEET	7.2 G/AC	POST12			
10. PYRAMIN +	500 ML/AC	POST1234	5.4AB	5.4A	2.2ABC
UPBEET	3.6 G/AC	POST1234			
LSD (P <0.05)			1.0	1.8	3.8

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Table 12.3. Effect of herbicide treatment on lamb's-quarters (CHEAL) and large crabgrass (DIGSA) control 56 days after application.

HERBICIDE	RATE		CHEAL	DIGSA
1. Check (WEED-FREE)			0E	0D
2. DUAL II MAGNUM	500 ML/AC	PRE	78D	96A
3. DUAL II MAGNUM	500 ML/AC	PRE	92AB	96A
PYRAMIN	2000 ML/AC	POST1		
4. DUAL II MAGNUM	500 ML/AC	PRE	94AB	99A
PYRAMIN +	2000 ML/AC	POST1		
UPBEET	14.4 G/AC	POST1		
5. DUAL II MAGNUM	500 ML/AC	PRE	93AB	99A
PYRAMIN +	1000 ML/AC	POST12		
UPBEET	7.2 G/AC	POST12		
6. DUAL II MAGNUM	500 ML/AC	PRE	98A	98A
PYRAMIN +	500 ML/AC	POST1234		
UPBEET	3.6 G/AC	POST1234		
7. PYRAMIN	2000 ML/AC	POST1	89BC	81AB
8. PYRAMIN +	2000 ML/AC	POST1	85C	60C
UPBEET	14.4 G/AC	POST1		
9. PYRAMIN +	1000 ML/AC	POST12	96A	71BC
UPBEET	7.2 G/AC	POST12		
10. PYRAMIN +	500 ML/AC	POST1234	98A	82AB
UPBEET	3.6 G/AC	POST1234		
LSD (P <0.05)			6	18

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Conclusions:

This experiment was conducted to determine the effectiveness of Pyramin+Upbeet applied as full, split or micro-rates, with or without a preemergence application of Dual II Magnum.

All treatments that included Pyramin+Upbeet provided greater than 90% control of common lamb's-quarters. Dual II Magnum alone provided good control of large crabgrass, but poor to fair control of common lamb's-quarters.

Visual injury was observed in the split-rate and micro-rate treatments, and corresponded to reductions in yield of No.1 and 2 beets where Dual II Magnum had been applied PRE, and where split-rates of Pyramin+Upbeet were applied. These results were in contrast to those observed in 2008, where no injury or yield reductions were observed. The primary difference between the trials was higher soil OM (9.2 vs. 3.2%) and lower sand content (49 vs 78%) in 2008 than in 2009. Additional research will be conducted in 2010 to confirm the importance of soil type. In this year, we found no benefit to applying the herbicides as sequential split or micro-rate treatments. However, previous research has shown in years or fields where multiple flushes of weeds occur, the best yields are obtained with the use of micro-rates.

Trial 13: Use of a Heat-Unit Model to Time Herbicide Applications in Red Beet

Objective: Determine the tolerance of red beet to Betamix and Upbeet.

Materials & Methods:

Crop: Red beet
Variety: Detroit Dark Red Planting date: June 9/09
Planting rate: 265 684 seeds/ha Depth: 2 cm
Row spacing: 38cm

Design: Randomized Complete Block Design
Plot width: 1.5m Plot length: 10m
Reps: 4

Field Preparation: Fertilized on June 8 with 18-18-18 at 300 kg/ha and 27-0-0 at 250 kg/ha. Back halves of the plot were maintained weed free.

Soil Description:

Sand: 58%	OM: 3.2%	Texture: v. fine sandy loam
Silt: 24%	pH: 6.9	Soil: Watford/Brady Series
Clay: 18%	CEC 15	

Spray Equipment:

Application Method: CO2 Backpack	Pressure: 207 KPA (30 PSI)
Nozzle Type: AIR INDUCTION	Nozzle Size: ULD120-02
Nozzle Spacing: 50 cm (20”)	Boom Width: 1.5 m (60”)
Spray Volume: 200 L/ha (20 GAL/AC)	

Table 13.1 Red beet visual injury 7, 14 and 28 days after application.

HERBICIDE	RATE / CHU	TIMING	VISUAL INJURY		
			7D	14D	28D
1. Check (WEED-FREE)			0C	0C	0C
2. DUAL II MAGNUM	500 ML/AC	PRE	0C	4BC	3BC
3. DUAL II MAGNUM	500 ML/AC	PRE	25A	50A	48A
PYRAMIN MICROS	250CHU	POST1234			
4. DUAL II MAGNUM	500 ML/AC	PRE	11B	10BC	8BC
PYRAMIN MICROS	300CHU	POST1234			
5. DUAL II MAGNUM	500 ML/AC	PRE	11B	14B	14B
PYRAMIN MICROS	350CHU	POST1234			
6. DUAL II MAGNUM	500 ML/AC	PRE	11B	11BC	9BC
PYRAMIN MICROS	400CHU	POST1234			
7. PYRAMIN MICROS	250CHU	POST1234	4C	5BC	5BC
8. PYRAMIN MICROS	300CHU	POST1234	0C	3BC	6BC
9. PYRAMIN MICROS	350CHU	POST1234	0C	5BC	8BC
10. PYRAMIN MICROS	400CHU	POST1234	0D	5BC	6BC
11. Check (WEEDY)			0C	0C	0C
LSD (P <0.05)			5	11	12

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Table 13.2 Effect of herbicide treatment on lamb's-quarters (CHEAL) and large crabgrass (DIGSA) control 56 days after application.

HERBICIDE	RATE/ CHU	TIMING	CHEAL	DIGSA
1. Check (WEED-FREE)			100A	100A
2. DUAL II MAGNUM	500 ML/AC	PRE	70C	97A
3. DUAL II MAGNUM	500 ML/AC	PRE	99AB	98A
PYRAMIN MICROS	250CHU	POST1234		
4. DUAL II MAGNUM	500 ML/AC	PRE	99AB	99A
PYRAMIN MICROS	300CHU	POST1234		
5. DUAL II MAGNUM	500 ML/AC	PRE	99AB	98A
PYRAMIN MICROS	350CHU	POST1234		
6. DUAL II MAGNUM	500 ML/AC	PRE	97AB	99A
PYRAMIN MICROS	400CHU	POST1234		
7. PYRAMIN MICROS	250CHU	POST1234	97AB	71BC
8. PYRAMIN MICROS	300CHU	POST1234	99AB	84B
9. PYRAMIN MICROS	350CHU	POST1234	97AB	75BC
10. PYRAMIN MICROS	400CHU	POST1234	96B	68C
11. Check (WEEDY)			0D	0D
LSD (P <0.05)			4	12

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Table 13.3 Effect of herbicide treatment on red beet yield (by grade).

HERBICIDE	RATE/ CHU	TIMING	YIELD (T/AC)		
			NO1	NO2	NO3
1. Check (WEED-FREE)			4.3A	3.7A	2.5A-D
2. DUAL II MAGNUM	500 ML/AC	PRE	2.2ABC	1.1BCD	0.6DE
3. DUAL II MAGNUM	500 ML/AC	PRE	1.4BC	1.3A-D	3.1ABC
PYRAMIN MICROS	250CHU	POST1234			
4. DUAL II MAGNUM	500 ML/AC	PRE	3.2AB	2.9ABC	4.7A
PYRAMIN MICROS	300CHU	POST1234			
5. DUAL II MAGNUM	500 ML/AC	PRE	3.1AB	2.0A-D	2.2B-E
PYRAMIN MICROS	350CHU	POST1234			
6. DUAL II MAGNUM	500 ML/AC	PRE	2.7ABC	3.5AB	3.4AB
PYRAMIN MICROS	400CHU	POST1234			
7. PYRAMIN MICROS	250CHU	POST1234	2.6ABC	1.7A-D	1.2B-E
8. PYRAMIN MICROS	300CHU	POST1234	3.1AB	3.7A	1.0B-E
9. PYRAMIN MICROS	350CHU	POST1234	2.9ABC	2.2A-D	1.0B-E
10. PYRAMIN MICROS	400CHU	POST1234	2.1ABC	0.9CD	0.8CDE
11. Check (WEEDY)			0.3C	0.0D	0.0E
LSD (P <0.05)			5	2.3	2.0

Conclusions:

This experiment was conducted to determine the tolerance of red beet to micro-rates of Pyramin +Upbeet (500 ml/ac + 7.2 g/ac) applied at 4 times using a heat-unit model approach, with and without a PRE application of Dual II Magnum. Micro-rates were applied at 250, 300, 350 and 400 CHUs.

Significant injury resulted when micro-rate applications were made following a PRE application of Dual II Magnum at the shortest interval (250 CHU), and decreased at the longer CHU intervals (300, 350 and 400 CHUs). Control of common lamb's-quarters was equivalent (greater than 90%) in all treatments. Large crabgrass control was excellent in those treatments where the micro-rate treatments followed a PRE application of Dual II Magnum.

Trial 14: Effect of Timing on Tolerance of Red Beet to Outlook

Objective: Determine the tolerance of red beet to PPI, PRE and POST applications of Outlook.

Materials & Methods:

Crop: Red beet
Variety: Detroit Dark Red Planting date: June 12
Planting rate: 265 684 seeds/ha Depth: 2 cm
Row spacing: 75cm

Design: Randomized Complete Block Design
Plot width: 1.5m Plot length: 10m
Reps: 4

Field Preparation: Fertilized on June 11 with 18-18-18 at 300 kg/ha and 27-0-0 at 250 kg/ha. The entire trial was maintained weed free.

Soil Description:
Sand: 50% OM: 7.3% Texture: Loam
Silt: 33% pH: 7.2 Soil: Watford/Brady Series
Clay: 17% CEC 26

Application Information:

	A	B	C
APPLICATION DATE	June 12	June 15	June 26
TIME OF DAY	4:00PM	9:00PM	8:30AM
TIMING	PPI	PRE	POST
AIR TEMP (c)	24	21	23
RH (%)	38	75	94
WIND SPEED (KPH)	4	0	2
SOIL TEMP (c)	24	20	22
CLOUD COVER (%)	38	75	94
CROP STAGE	PPI	PRE	COT-2 LF

Spray Equipment:

Application Method: CO2 Backpack Pressure: 207 KPA (30 PSI)
Nozzle Type: AIR INDUCTION Nozzle Size: ULD120-02
Nozzle Spacing: 50 cm (20”) Boom Width: 1.5 m (60”)
Spray Volume: 200 L/ha (20 GAL/AC)

Table 14.1 Red beet visual injury 7, 14 and 28 days after application.

HERBICIDE	TIMING	RATE	VISUAL INJURY		
			7D	14D	28D
1. Check (WEED-FREE)			0A	0A	0A
2. OUTLOOK	PPI	0.42 L/AC	6A	5A	0A
3. OUTLOOK	PPI	0.84 L/AC	11A	8A	0A
4. OUTLOOK	PRE	0.42 L/AC	9A	8A	0A
5. OUTLOOK	PRE	0.84 L/AC	13A	5A	0A
6. OUTLOOK	POST	0.42 L/AC	0A	0A	0A
7. OUTLOOK	POST	0.84 L/AC	0A	0A	0A
LSD (P <0.05)			13	9	0

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Table 14.2 Effect of herbicide treatment on red beet sugar and yield (by grade).

HERBICIDE	RATE		% SUGAR	YIELD (T/AC)		
				NO1	NO2	NO3
1. Check (WEED-FREE)			10A	4.1A	4.3A	7.1A
2. OUTLOOK	PPI	0.42 L/AC	10A	2.8A	4.9A	6.0A
3. OUTLOOK	PPI	0.84 L/AC	10A	3.5A	4.3A	6.2A
4. OUTLOOK	PRE	0.42 L/AC	10A	4.6A	4.6A	7.3A
5. OUTLOOK	PRE	0.84 L/AC	10A	5.1A	4.4A	5.9A
6. OUTLOOK	POST	0.42 L/AC	10A	4.2A	4.6A	6.6A
7. OUTLOOK	POST	0.84 L/AC	9A	4.2A	4.4A	7.1A
LSD (P <0.05)			1	3.7	2.3	4.1

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Conclusions:

This experiment was conducted to determine the tolerance of red beet to Outlook applied pre-plant incorporated, preemergence or postemergence. Outlook caused injury at 7 and 14 DAE in the PPI and PRE treatments, but by 28 DAE, the injury was no longer evident. Despite this injury, sugar content and yield were not less than the untreated check at any of the herbicide timings or rates.

Trial 15: Tolerance of Sweet Corn to Prowl H20

Objective: Determine the tolerance of sweet corn to PRE and POST applications of Prowl H20.

Materials & Methods:

Crop: Sweet corn
Variety: various
Planting date: May 19
Planting rate: 50000 plants/ha
Depth: 4 cm
Row spacing: 45cm

Design: Randomized Complete Block Design
Plot width: 6m
Plot length: 10m
Reps: 4

Field Preparation: 24.3-2.6-4.1 (137 KG/HA ACTUAL N) WAS CUSTOM APPLIED MAY 5-09. FERTILIZER WAS WORKED INTO GROUND 1.5 HOURS AFTER APPLICATION WITH S-TINE CULTIVATOR.

Soil Description:
Sand: 51%
OM: 3.6%
Texture: sandy clay loam
Silt:27%
pH: 6.7
Soil: Watford/Brady Series
Clay: 23%
CEC 16

Application Information:

	A	B
Application Date:	May-22-2009	Jun-2-2009
Time of Day:	7:35 AM	9:05 AM
Application Method:	CO2 SPRAY	CO2 SPRAY
Application Timing:	PRE	2 LF
Application Placement:	SOIL	FOLIAR
Air Temperature, Unit:	16.5 C	20.2 C
% Relative Humidity:	75	49
Wind Velocity, Unit:	8 KPH	2 KPH
Soil Temperature, Unit:	24 C	21 C
% Cloud Cover:	75	75
Crop Stage	PRE	2-3LF

Spray Equipment:

Application Method: CO2 Backpack
Pressure: 207 KPA (30 PSI)
Nozzle Type: AIR INDUCTION
Nozzle Size: ULD120-02
Nozzle Spacing: 50 cm (20”)
Boom Width: 1.5 m (60”)
Spray Volume: 200 L/ha (20 GAL/AC)

Table 15.1. Effect of Prowl H20 timing and rate on sweet corn visual injury 7, 14 and 28 days after application.

VARIETY		PROWL H20 RATE (ML/ac)	VISUAL INJURY 7 DAT	14 DAT	28 DAT
1. CAHILL	PRE	1500	1A	2A	0A
		3000	0B	1A	0A
	POST	1500	1A	1B	0A
		3000	3A	2A	0A
2. GH4927	PRE	1500	0A	1A	0A
		3000	0A	1A	0A
	POST	1500	1A	1A	1A
		3000	1A	0A	0A
3. HARV GOLD	PRE	1500	3B	3B	0A
		3000	7A	6A	1A
	POST	1500	0B	2A	2A
		3000	2A	1A	1A
4. ROCKER	PRE	1500	1B	1B	0A
		3000	3A	2A	0A
	POST	1500	0A	0A	1A
		3000	0A	0A	0A
LSD (P <0.05)			1	1	NS

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Table 15.2. Effect of Prowl timing and rate on sweet corn cob weight (g/cob) at harvest and marketable yield (T/ac).

VARIETY		PROWL RATE (ML/ac)	Cob wt (g/cob)	Yield (T/ac)
1. CAHILL		0	268	11.7
	PRE	1500	259	12.3
		3000	277	12.1
	POST	1500	265	11.0
		3000	381	12.5
2. GH4927		0	271	13.9
	PRE	1500	277	15.4
		3000	258	16.5
	POST	1500	243	12.0
		3000	263	17.5
3. HARV GOLD		0	323	12.5
	PRE	1500	299	13.4
		3000	327	12.5
	POST	1500	293	11.1
		3000	305	13.8
4. ROCKER		0	296	12.2
	PRE	1500	308	15.9
		3000	307	15.2
	POST	1500	310	14.4
		3000	321	16.1
LSD (P <0.05)			NS	NS

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Conclusions:

Some leaf distortion was observed in all varieties tested at 7 and 14 days after emergence (DAE), but the injury was commercially acceptable and no longer visible by 28 DAE. Marketable cob size and yield were not reduced by Prowl H20.

Trial 16: Tolerance of Sweet Corn to Kixor

Objective: Determine tolerance of eight sweet corn varieties to PRE applications of Kixor.

Materials & Methods:

Crop: Sweet corn
Variety: various
Planting rate: 50000 plants/ha
Row spacing: 45cm
Planting date: May 19
Depth: 4 cm

Design: Randomized Complete Block Design
Plot width: 6m
Plot length: 10m
Reps: 4

Field Preparation: 24.3-2.6-4.1 (137 KG/HA ACTUAL N) WAS CUSTOM APPLIED MAY 5-09. FERTILIZER WAS WORKED INTO GROUND 1.5 HOURS AFTER APPLICATION WITH S-TINE CULTIVATOR.

Soil Description:
Sand: 51%
Silt:27%
Clay: 23%
OM: 3.6%
pH: 6.7
CEC 16
Texture: sandy clay loam
Soil: Watford/Brady Series

Application Information:

	A
APPLICATION DATE	MAY 22
TIME OF DAY	7:55AM
TIMING	PRE
AIR TEMP (c)	16
RH (%)	75
WIND SPEED (KPH)	8
SOIL TEMP (c)	24
CLOUD COVER (%)	85
CROP STAGE	PRE

Spray Equipment:

Application Method: CO2 Backpack
Nozzle Type: AIR INDUCTION
Nozzle Spacing: 50 cm (20”)
Spray Volume: 200 L/ha (20 GAL/AC)
Pressure: 207 KPA (30 PSI)
Nozzle Size: ULD120-02
Boom Width: 1.5 m (60”)

Table 16.1. Effect of Kixor rate on sweet corn visual injury 7, 14 and 28 days after application.

VARIETY	KIXOR RATE (ML/ac)	VISUAL INJURY 7 DAT	14 DAT	28 DAT
1. CAHILL	43	2B	2B	0
	86	5A	4A	2
2. GH4927	43	2B	1B	0
	86	6A	4A	0
3. HARVEST GOLD	43	5A	2B	3
	86	11A	5A	5
4. ROCKER	43	1B	1B	0
	86	4A	3A	0
5. BSS5362	43	2B	3A	0
	86	9A	4A	4
6. GG236	43	2B	2B	0
	86	6A	4A	0
7. G447	43	3B	1B	0
	86	5A	3A	0
8. GG763	43	5B	4B	0
	86	12A	12A	7
LSD (P <0.05)		2	2	NS

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Table 16.2. Effect of Kixor rate on sweet corn height 28 days after application, cob size and marketable yield.

VARIETY	KIXOR RATE (ML/AC)	HEIGHT cm	COB WT g/cob	YIELD T/ac
1. CAHILL	0	23	261	12.3
	43	22	255	11.3
	86	22	259	11.5
2. GH4927	0	28	264	14.7
	43	29	257	15.0
	86	29	249	12.5
3. HARVEST GOLD	0	27	241	9.2
	43	25	297	10.1
	86	25	279	8.3
4. ROCKER	0	28	289	11.8
	43	28	305	13.1
	86	28	293	11.5
5. BSS5362	0	21	254	11.2
	43	24	267	8.2
	86	19	306	7.5
6. GG236	0	23	265	10.0
	43	24	276	11.5
	86	24	264	9.8
7. G447	0	24	345	16.3
	43	29	362	17.5
	86	25	313	16.0
8. GG763	0	19	297	13.3
	43	18	285	12.9
	86	16	268	11.2
LSD (P <0.05)		NS	NS	NS

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Conclusions:

Kixor caused slight visual injury in all varieties, which consisted of leaf speckling. All varieties outgrew this injury, and there were no reductions in height, cob size or yield. This study was repeated at Ridgetown and Huron Research Station.

Trial 17: Tolerance of Sweet Corn to Kixor/Outlook

Objective: Determine tolerance of eight sweet corn varieties to PRE applications of Kixor/Outlook.

Materials & Methods:

Crop: Sweet corn
Variety: various
Planting date: May 19
Planting rate: 50000 plants/ha
Depth: 4 cm
Row spacing: 45cm

Design: Randomized Complete Block Design
Plot width: 6m
Plot length: 10m
Reps: 4

Field Preparation: 24.3-2.6-4.1 (137 KG/HA ACTUAL N) WAS CUSTOM APPLIED MAY 5-09. FERTILIZER WAS WORKED INTO GROUND 1.5 HOURS AFTER APPLICATION WITH S-TINE CULTIVATOR.

Soil Description:
Sand: 51%
OM: 3.6%
Texture: sandy clay loam
Silt:27%
pH: 6.7
Soil: Watford/Brady Series
Clay: 23%
CEC 16

Application Information:

	A
APPLICATION DATE	MAY 22
TIME OF DAY	7:55AM
TIMING	PRE
AIR TEMP (c)	16
RH (%)	75
WIND SPEED (KPH)	8
SOIL TEMP (c)	24
CLOUD COVER (%)	85
CROP STAGE	PRE

Spray Equipment:

Application Method: CO2 Backpack
Pressure: 207 KPA (30 PSI)
Nozzle Type: AIR INDUCTION
Nozzle Size: ULD120-02
Nozzle Spacing: 50 cm (20”)
Boom Width: 1.5 m (60”)
Spray Volume: 200 L/ha (20 GAL/AC)

Table 17.1. Effect of Kixor/Outlook rate on sweet corn visual injury 7, 14 and 28 days after application.

VARIETY	KIXOR/OUTLOOK RATE (GA/HA)	VISUAL INJURY 7 DAT	14 DAT	28 DAT
1. CAHILL	445	1AB	1	0
	890	2A	0	0
2. GH4927	445	2A	1	0
	890	3A	1	0
3. HARVEST GOLD	445	5A	1	0
	890	5A	1	0
4. ROCKER	445	2A	1	0
	890	2A	1	0
5. BSS5362	445	3A	1	1
	890	4A	2	1
6. GG236	445	2A	1	0
	890	2A	1	0
7. G447	445	3A	0	0
	890	2A	1	1
8. GG763	445	6A	2	0
	890	6A	4	1
LSD (P <0.05)		2	NS	NS

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Table 17.2. Effect of Kixor/Outlook rate on sweet corn height 28 days after application, cob size and marketable yield.

VARIETY	KIXOR/OUTLOOK RATE (GA/HA)	HEIGHT cm	COB WT g/cob	YIELD T/ac
1. CAHILL	0	23	269	11.4
	445	24	252	11.9
	890	22	253	11.0
2. GH4927	0	31	250	14.7
	445	31	258	15.8
	890	30	250	13.6
3. HARVEST GOLD	0	28	304	14.3
	445	27	279	14.6
	890	26	295	13.0
4. ROCKER	0	28	293	11.9
	445	28	301	12.8
	890	24	278	11.2
5. BSS5362	0	22	239	12.2
	445	22	248	12.2
	890	21	245	10.4
6. GG236	0	28	260	12.5
	445	25	261	10.7
	890	25	260	10.7
7. G447	0	26	335	17.8
	445	27	328	17.4
	890	26	297	14.7
8. GG763	0	20	294	12.7
	445	20	308	13.1
	890	20	289	13.3
LSD (P <0.05)		NS	NS	NS

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Conclusions:

Kixor/Outlook caused slight visual injury in all varieties, which consisted of leaf speckling. All varieties outgrew this injury, and there were no reductions in height, cob size or yield. This study was repeated at Ridgetown and Huron Research Station.

Trial 18: Effect of Hail Damage on Tolerance of Sweet Corn to Herbicides

Objective: Determine the effect of cumulative stress caused by hail damage and herbicide application, with and without application of fungicide.

Materials & Methods:

Crop: Sweet corn
Variety: various
Planting date: May 19
Planting rate: 50000 plants/ha
Depth: 4 cm
Row spacing: 45cm

Design: Randomized Complete Block Design
Plot width: 6m
Plot length: 10m
Reps: 4

Field Preparation: 24.3-2.6-4.1 (137 KG/HA ACTUAL N) WAS CUSTOM APPLIED MAY 5-09. FERTILIZER WAS WORKED INTO GROUND 1.5 HOURS AFTER APPLICATION WITH S-TINE CULTIVATOR.

Soil Description:
Sand: 51%
OM: 3.6%
Texture: sandy clay loam
Silt:27%
pH: 6.7
Soil: Watford/Brady Series
Clay: 23%
CEC 16

Application Information:

	A
APPLICATION DATE	JUN 11
TIME OF DAY	6:50AM
TIMING	POST
AIR TEMP (c)	16
RH (%)	91
WIND SPEED (KPH)	7
SOIL TEMP (c)	17
CLOUD COVER (%)	100
CROP STAGE	4 LF

HAIL DAMAGE WAS SIMULATED ON JUNE 10 – ONE DAY BEFORE HERBICIDE APPLICATION.

Spray Equipment:

Application Method: CO2 Backpack
Pressure: 207 KPA (30 PSI)
Nozzle Type: AIR INDUCTION
Nozzle Size: ULD120-02
Nozzle Spacing: 50 cm (20”)
Boom Width: 1.5 m (60”)
Spray Volume: 200 L/ha (20 GAL/AC)

Table 18.1. Effect of hail damage, herbicide treatment and fungicide (pyraclostrobin) on sweet corn visual injury caused by hail and herbicide 7 days after application.

HAIL Y/N	HERBICIDE	FUNGICIDE? Y/N	VISUAL INJURY HAIL	VISUAL INJURY HERBICIDE
N	UNTREATED	N	0B	0D
Y	UNTREATED	N	21A	0D
Y	CALLISTO/ATRAZINE	N	18A	2CD
Y	CALLISTO/ATRAZINE	Y	21A	5C
Y	ACCENT	N	22A	11B
Y	ACCENT	Y	20A	13AB
Y	PARDNER	N	22A	14AB
Y	PARDNER	Y	22A	17A
N	CALLISTO/ATRAZINE	N	0B	0D
N	CALLISTO/ATRAZINE	Y	0B	2CD
N	ACCENT	N	0B	4CD
N	ACCENT	Y	0B	4CD
N	PARDNER	N	0B	14AB
N	PARDNER	Y	0B	13AB
LSD (P <0.05)			5	5

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Table 18.2. Effect of hail damage, herbicide treatment and fungicide (pyraclostrobin) on sweet corn plant dry weight and yield.

HAIL Y/N	HERBICIDE	FUNGICIDE? Y/N	DRY WT G/ 5PLANT	YIELD T/AC
N	UNTREATED	N	51AB	11.1A
Y	UNTREATED	N	35AB	11.4A
Y	CALLISTO/ATRAZINE	N	26B	12.9A
Y	CALLISTO/ATRAZINE	Y	35AB	10.7A
Y	ACCENT	N	29AB	10.5A
Y	ACCENT	Y	30AB	11.5A
Y	PARDNER	N	31AB	10.7A
Y	PARDNER	Y	36AB	12.1A
N	CALLISTO/ATRAZINE	N	54A	14.1A
N	CALLISTO/ATRAZINE	Y	52AB	12.4A
N	ACCENT	N	52AB	12.8A
N	ACCENT	Y	48AB	13.1A
N	PARDNER	N	41AB	12.9A
N	PARDNER	Y	46AB	11.9A
LSD (P <0.05)			26	4

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Conclusions:

Injury, height (data not shown) and plant dry weight reductions were significant (>20%) in treatments that had hail damage, and greater than 10% in the two Pardner treatments. The addition of pyraclostrobin did not reduce the level of injury or reductions in dry weight. Despite the high level of visual injury in most treatments, marketable yield was not less than the untreated check in any treatments.

Trial 19. Weed Management in Pumpkins

Objective: Determine the tolerance of pumpkin to preemergence applications of Command, Sandea, and Reflex.

Materials & Methods:

Crop: Pumpkin
Variety: Appalachian
Planting date: May 20
Planting rate: 5000 plants/ha
Depth: 2.5 cm
Row spacing: 3m

Design: Randomized Complete Block Design
Plot width: 2m
Plot length: 10m
Reps: 4

Field Preparation: Trial fertilized with 300 kg/ha of 10-26-26 and 300 kg/ha of 27-0-0 on May 19.

Soil Description:
Sand: 63%
OM: 4.4%
Texture: v. fine sandy loam
Silt:20%
pH: 5.9
Soil: Watford/Brady Series
Clay: 17%
CEC 12

Application Information:

	A
APPLICATION DATE	MAY 23
TIME OF DAY	10:00AM
TIMING	PRE
AIR TEMP (c)	20
RH (%)	45
WIND SPEED (KPH)	1
SOIL TEMP (c)	21
CLOUD COVER (%)	0
CROP STAGE	PRE

Spray Equipment:

Application Method: CO2 Backpack
Pressure: 207 KPA (30 PSI)
Nozzle Type: AIR INDUCTION
Nozzle Size: ULD120-02
Nozzle Spacing: 50 cm (20”)
Boom Width: 1.5 m (60”)
Spray Volume: 200 L/ha (20 GAL/AC)

Table 19.1. Effect of herbicide treatment on pumpkin visual injury 7, 14 and 28 days after application, pumpkin number per plot and yield.

HERBICIDE	RATE	VISUAL INJURY 7D	14D	28D	#/PLOT	YIELD T/AC
1. Check (WEEDFREE)		0A	0A	0A	9B	48.6B
2. COMMAND	0.63L/AC	0A	0A	0A	15A	76.6AB
3. COMMAND	1.26 L/AC	0A	0A	0A	11AB	64.3AB
4. SANDEA	25 G/AC	0A	0A	0A	11AB	60.3B
5. SANDEA	50 G/AC	0A	0A	0A	12AB	68.1AB
6. REFLEX	0.4 L/AC	0A	0A	0A	15AB	70.8AB
7. REFLEX	0.8 L/AC	0A	0A	0A	11AB	60.8B
8. COMMAND + SANDEA	0.63 L/AC 25 G/AC	0A	0A	0A	12AB	69.3AB
9. COMMAND + REFLEX	450 ML/AC 0.4 L/AC	0A	0A	0A	14AB	90.3A
LSD (P <0.05)		0	0	0	2	5.0

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Conclusions:

This trial was kept weed-free to test for the effect of preemergence applications of Command, Sandea and Reflex on visual injury, stand and yields of pumpkin.

Visual initial injury was not observed in any of the treatments, and the number of pumpkins per plot and yield were not less than the untreated check. Extremely high weed pressure in the untreated check reduced yield.

Trial 20. Weed Management in Squash

Objective: Determine the tolerance of squash to preemergence applications of Command, Sandea, and Reflex.

Materials & Methods:

Crop: Squash
Variety: Ultra Supreme
Planting date: May 20
Planting rate: 5000 plants/ha
Depth: 2.5 cm
Row spacing: 3m

Design: Randomized Complete Block Design
Plot width: 2m
Plot length: 10m
Reps: 4

Field Preparation: Trial fertilized with 300 kg/ha of 10-26-26 and 300 kg/ha of 27-0-0 on May 19.

Soil Description:
Sand: 63%
OM: 4.4%
Texture: v. fine sandy loam
Silt:20%
pH: 5.9
Soil: Watford/Brady Series
Clay: 17%
CEC 12

Application Information:

	A
APPLICATION DATE	MAY 23
TIME OF DAY	10:00AM
TIMING	PRE
AIR TEMP (c)	20
RH (%)	45
WIND SPEED (KPH)	1
SOIL TEMP (c)	21
CLOUD COVER (%)	0
CROP STAGE	PRE

Spray Equipment:

Application Method: CO2 Backpack
Pressure: 207 KPA (30 PSI)
Nozzle Type: AIR INDUCTION
Nozzle Size: ULD120-02
Nozzle Spacing: 50 cm (20”)
Boom Width: 1.5 m (60”)
Spray Volume: 200 L/ha (20 GAL/AC)

Table 20.1. Effect of herbicide treatment on squash visual injury 7, 14 and 28 days after application, squash number per plot and yield.

HERBICIDE	RATE	VISUAL INJURY			#/PLOT	YIELD
		7D	14D	28D		T/AC
1. Check (WEEDFREE)		0A	0A	0A	33A	27.1A
2. COMMAND	0.63L/AC	0A	0A	0A	38A	31.7A
3. COMMAND	1.26 L/AC	0A	0A	0A	33A	27.1A
4. SANDEA	25 G/AC	0A	0A	0A	39A	32.3A
5. SANDEA	50 G/AC	0A	0A	0A	36A	29.6A
6. REFLEX	0.4 L/AC	0A	0A	0A	34A	28.3A
7. REFLEX	0.8 L/AC	0A	0A	0A	33A	27.7A
8. COMMAND + SANDEA	0.63 L/AC 25 G/AC	0A	0A	0A	30A	25.0A
9. COMMAND + REFLEX	450 ML/AC 0.4 L/AC	0A	0A	0A	31A	26.0A
LSD (P <0.05)		NS	NS	NS	12	9.9

Note: Means followed by the same letter are not significantly different (P=0.05, LSD).

Conclusions:

This trial was kept weed-free to test for the effect of preemergence applications of Command, Sandea and Reflex on visual injury, stand and yields of squash.

Visual initial injury was not observed in any of the treatments, and the number of squash per plot and yield were not less than the untreated check.