

WEED CONTROL IN PEPPERS

RESEARCH RESULTS – 2006

**PREPARED BY DARREN ROBINSON,
RIDGETOWN CAMPUS**

**FOR THE ONTARIO PROCESSING
VEGETABLE GROWERS**

NOVEMBER 8, 2006

ACKNOWLEDGEMENTS

Purpose Of This Booklet

This booklet is provided as a guide to the 2006 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 2006 research program was provided by:

Ontario Processing Vegetable Growers
Summer Job Service 2006
Agriculture & Agri-Food Canada

Ontario Food Processors Association
Summer Career Placements 2006
Agchemical Companies

Technical Assistants

Research Technician
Dave Bilyea
Kristen McNaughton

Research Assistants
Michelle Verbeek
Kyle Vink
Jamie Lynn Lather
Darcy Vink
Sean Vink

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.

D.E. Robinson
Ridgetown Campus, University of Guelph
Ridgetown, Ontario
N0P 2C0
(519) 674-1604
drobinso@ridgetownc.uoguelph.ca

TABLE OF CONTENTS

#	TRIAL NAME	PAGE
1.	Tolerance of Transplanted Pepper to Various Herbicides	4
2.	Weed Control and Tolerance of Peppers to Micro-rates of Basagran	7

Trial 1: Tolerance of Transplanted Pepper to Various Herbicides

Objective: Determine weed control and tolerance of processing pea to preemergence applications of sulfentrazone, KIH-485 and Impact.

Materials & Methods:

Crop: Pepper

Variety: Socrates

Planting rate: 29167 plants/ha

Row spacing: 45cm

Planting date: May 30

Depth: 5 cm

Design: Randomized Complete Block Design

Plot width: 1.5m

Plot length: 10m

Reps: 4

Field Preparation: Applied 105 kg N/ha using 18-19-19 on May 29, 2006. Fertilizer was worked into the soil using an S-tine cultivator.

Soil Description:

Sand: 52%

Silt: 28%

Clay: 20%

OM: 5.9%

pH: 7.2

CEC 14

Texture: Sandy Clay Loam

Soil: Watford/Brady Series

Application Information:

	A
APPLICATION DATE	MAY 30
TIME OF DAY	9:40 AM
TIMING	PRE-T
AIR TEMP (c)	29
RH (%)	49
WIND SPEED (KPH)	4
SOIL TEMP (c)	28
CLOUD COVER (%)	10
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 1.1. Effect of herbicide treatment on ‘Socrates’ pepper visual injury 7, 14 and 28 days after emergence, and height 21 days after emergence.

HERBICIDE	RATE	VISUAL INJURY			HEIGHT CM
		7D	14D	28D	
1. Check (WEEDFREE)		0A	0B	0B	16A
2. IMPACT	22.5 ML/AC	0A	0B	1B	16A
3. IMPACT	45 ML/AC	0A	1B	1B	17A
4. KIH-485	100 G/AC	0A	2B	2B	15AB
5. KIH-485	200 G/AC	0A	9B	16B	14B
6. SULFENTRAZONE	67.5 G/AC	0A	0B	1B	16A
7. SULFENTRAZONE	135 G/AC	0A	0B	2B	15AB
LSD (P <0.05)		0	2	3	2

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

Table 1.2. Effect of herbicide treatment on ‘Socrates’ pepper fruit size and yield.

HERBICIDE	RATE	FRUIT SIZE	YIELD
		G	T/AC
1. Check (WEEDFREE)		161AB	10.0AB
2. IMPACT	22.5 ML/AC	157B	9.2B
3. IMPACT	45 ML/AC	169A	10.8A
4. KIH-485	100 G/AC	162AB	9.9AB
5. KIH-485	200 G/AC	161AB	9.0B
6. SULFENTRAZONE	67.5 G/AC	163AB	10.2AB
7. SULFENTRAZONE	135 G/AC	166AB	10.8A
LSD (P <0.05)		10	1.6

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

Conclusions:

This trial examined tolerance of transplanted pepper to preemergence applications of Impact, KIH-485 and SULFENTRAZONE (called AUTHORITY IN THE US).

Impact and SULFENTRAZONE did not injure pepper, while KIH-485 caused significant stunting and some leaf deformation and burning at twice the proposed use rate. There were no differences in fruit size among any of the treatments, however total yield was significantly less than the untreated check at the 2X rate of KIH-485. SULFENTRAZONE did not reduce fruit size or yield of transplanted pepper, a result we have observed consistently over three years of study.

Data collected from the 2003-2005 field seasons were submitted to support the Command (2003-1578) URMULE in pepper.

Trial 2: Weed Control and Tolerance of Peppers to Micro-rates of Basagran

Objectives: Determine the tolerance of peppers to 3 sequential micro-rates of Basagran applied at 233 ml/ac each time.

Materials & Methods:

Crop: Pepper

Variety: Socrates

Planting rate: 29167 plants/ha

Row spacing: 45cm

Planting date: May 30

Depth: 5 cm

Design: Randomized Complete Block Design

Plot width: 1.5m

Plot length: 10m

Reps: 4

Field Preparation: Applied 105 kg N/ha using 18-19-19 on May 29, 2006. Fertilizer was worked into the soil using an S-tine cultivator.

Soil Description:

Sand: 52%

Silt: 28%

Clay: 20%

OM: 5.9%

pH: 7.2

CEC 14

Texture: Sandy Clay Loam

Soil: Watford/Brady Series

Application Information:

	A	B	C
APPLICATION DATE	JUN 8	JUN 14	JUN 22
TIME OF DAY	6:45AM	6:05AM	7:45AM
TIMING	10 DAT	17 DAT	24 DAT
AIR TEMP (c)	18	12	20
RH (%)	85	85	92
WIND SPEED (KPH)	3	0	3
SOIL TEMP (c)	19	12	22
CLOUD COVER (%)	10	0	95
CROP STAGE	6-9 LF	7-13 LF	9-15 LF
COMMON RAGWEED STAGE	COT-4 LF	6-8 LF	COT-8 LF
LAMBSQUARTERS STAGE	COT-6LF	COT-6LF	2-6 LF
REDROOT PIGWEED STAGE	1-2 LF	COT-4 LF	2-6 LF
VELVETLEAF STAGE	COT-1 LF	1-4 LF	2-5 LF

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")

Conclusions:

Basagran was applied in three banded micro-rate sprays at 233 or 466 ml/ac over pepper rows at weekly intervals, starting 10 days after transplanting. We attempted to minimize drift using air induction nozzles and spraying when wind speed was 3 km/hr or less.

Injury to pepper was still observed after each micro-rate application. Injury consisted of contact burning of the leaves, and stunting at both rates. At the 233 ml/ac rate, the plants did outgrow the injury, so that mean pepper size and yield were not less than the untreated check. At the 466 ml/ac, fruit size was reduced, but because more fruit were produced, total yield was unaffected.

The 233 ml/ac micro-rates gave good control of velvetleaf, and fair control of redroot pigweed, but did not adequately control ragweed or lambsquarters due to multiple flushes of these weeds emerging after the last micro-rate application.

Future research will focus on applying the herbicide between rows, as pepper did not have acceptable tolerance to the in-row micro-rate applications. Application timing will also have to be adjusted to the stage of the weeds, as weeds were too large to be controlled at the rates of Basagran used in this study.