

Basics on Organic & Conventional Weed Control

for the Great Plains Growers Conference 2011

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Organic- requires a combination of methods

- Prevention
- Cover cropping
- Flame weeding
- Stale Seedbed
- Cultivation
- Crop rotation
- Mulching
- Mowing
- Living Mulches
- Biological Diversity

Cover Cropping & Cultivation (SARE pubs)

Flaming Weeding

- Hand carried
- Hand carried with wheel assist
- Hand pushed with shields
- Units mounted behind a tractor (sometimes with shields)

Stale Seedbed- uses flaming

- Relies on critical weed free period
- Techniques to flush more weeds and hit them before crop emerges
- Followed up with more flaming or cultivation

State	Location of Study	Vegetable Crop Studied	Major Weeds Present
Ohio	Wesley	Tomatoes	Common lambsquarters, yellow nutsedge, green foxtail
Michigan	East Lansing	Tomatoes	Common lambsquarters, yellow nutsedge, green foxtail
Michigan	East Lansing	Tomatoes	Common lambsquarters, yellow nutsedge, green foxtail
Michigan	East Lansing	Tomatoes	Common lambsquarters, yellow nutsedge, green foxtail
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More on heat & weeds

- Can use flaming with shields
- As with most herbicides, more effective on smaller weeds
- Cost per acre is not too bad
- Some interest in hot water or steam units
- Small scale size has been quite expensive
- Comments & discussion?

Why glyphosate is so widely used in vegetable production

- Use allowed for all vegetables
- Shielded application expands functionality
- Can be combined with other herbicides
- Can multitask with other farm & yard uses
- Short preharvest & reentry intervals



Some problems and limitations

- Direct seeded crops
- Some other products work better on some weeds
- Does not inhibit new weed emergence

Which of these three performs the worst on yellow nutsedge- Basagran, glyphosate products, or Sandea/Permit?



Are you familiar with this table?

Table 19. Relative Effectiveness of Herbicides for Vegetable Crops*

Vegetable	Chemical	Effectiveness
Cucurbits	Alachlor	100
	Aliflor	100
	Allyl	100
	Asulam	100
	Baclofen	100
	Bifenox	100
	Chlorimuron	100
	Chlorpyrifos	100
	Fluazifop	100
	Fluroxypyr	100
Leafy Greens	Alachlor	100
	Aliflor	100
	Allyl	100
	Asulam	100
	Baclofen	100
	Bifenox	100
	Chlorimuron	100
	Chlorpyrifos	100
	Fluazifop	100
	Fluroxypyr	100



Some problems and limitations

- Resistance is coming!
- Test question- how far can waterhemp seeds go airborne?
- Bonus- how does it move that far?
- Over reliance (e.g. in favor of decent directed spray products)
- Continued control during wet years

One origin of glyphosate resistance was from continuous use in an orchard



Table 21. Common Names of Registered Herbicides

Common Name	Trade Name	Preherbicide	HRAC Group	P	Registration
alachlor	Trifluralin, Oryzalin, Sencor	Chlorimuron, Trifluralin, Metolachlor	OP	4	1974
atrazine	Atrazin	Alachlor, Trifluralin, Metolachlor	OP	4	1974
glyphosate	Roundup	Alachlor, Trifluralin, Metolachlor	OP	4	1974
glyphosate	Roundup	Alachlor, Trifluralin, Metolachlor	OP	4	1974
glyphosate	Roundup	Alachlor, Trifluralin, Metolachlor	OP	4	1974
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glyphosate	Roundup	Alachlor, Trifluralin, Metolachlor	OP	4	1974
glyphosate	Roundup	Alachlor, Trifluralin, Metolachlor	OP	4	1974

* See inside front cover for abbreviations: Herbicide Resistance Action Committee Groups: Herbicides in the same HRAC group have similar modes of action for killing weeds. To reduce the risk of herbicide resistance, do not rely on herbicides in a single HRAC group year after year.

MU's Plant Protection Program

- Some funds for small projects in horticulture and agronomy
- 2009 project focused on weed control
- Insect pest control was also addressed
- Direct seeded-
 - Green beans
 - Sweet corn
 - Pumpkins
- With plastic mulch-
 - Cabbage
 - Zucchini
 - Watermelons
 - Tomatoes

Decent herbicide options for direct seeded crops

Unless you have well drained soil, or the ability (& faith?) you can get into the field and incorporate a herbicide in the spring-
Use preemergent surface applied herbicides!

<p>Green beans</p> <ul style="list-style-type: none"> • Preplant- <ul style="list-style-type: none"> - Dual II Magnum - Command • Postemergent- <ul style="list-style-type: none"> - Sandea - Poast (or Select) <p><i>Watch out for Pursuit and Reflex plant back restrictions</i></p>	<p>Sweet corn</p> <ul style="list-style-type: none"> • Preplant <ul style="list-style-type: none"> - Atrazine (cheap & versatile)* - Bicep * & Dual Magnum • Postemergent- <ul style="list-style-type: none"> - Impact *, Atrazine * and Callisto * - 2,4-D (drift hazard!) <p><i>* Watch out for plant back restrictions</i></p>
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Chemical Weed Management Options

Sweet Corn

- Atrazine and 2,4-D (Early Planting)
 - Cut off date is June 12th
- Late season planting
 - Limit atrazine to ½ pound
 - Good on ragweed
 - Late germinating grasses are a concern
 - Include Dual Magnum to suppress grasses
 - Has limited carry-over
 - Use maximum rate allowed

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Chemical Weed Management Options

- Cost per Acre
 - Atrazine - \$4 - 6.50
 - 2,4-D - \$1 - 2.00
 - Dual Magnum - \$40 - 46.00

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Plastic mulch crop herbicide treatments

Cabbage & Zucchini

- Plastic laid - April 24
- Planted- May 5
- Treatments with white paint (applied)- May 11
- Herbicides- May 20
 - Command & paraquat

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Quick crops & plastic mulch programs

- Command is broadly labeled
- May need to combine with a burndown
 - glyphosate or
 - paraquat
- Then weed whip or mow; little benefit on yield with further weed control
- Burndown tips
 - If weeds are larger than 3 inches use glyphosate instead of paraquat
 - Residual herbicide will contact soil quicker if using paraquat

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Plastic mulch crop herbicide treatments

Watermelon

- Sinbar+paraquat (pre)
- Command+paraquat (pre) & Sandea+Poast (post)

Plastic laid April 24 & pre 5/20, post 6/18

- Glyphosate (post)
- Glyphosate (pre) & paraquat (post)
- Glyphosate (pre) & Sandea+Poast (post)

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Watermelon results

1 (poor) to 10 excellent for Grass (G) or Broadleaf weeds (B)

Treatment	Results- August 3rd
• Sinbar+paraquat (pre)	• G/5 B/5
• Command+paraquat (pre) & Sandea+paraquat (post)	• G/8.5 B/5.5
• Glyphosate (post)	• G/1 B/5
• Glyphosate (pre) & paraquat (post)	• G/4.5 B/5.5
• Glyphosate (pre) & Sandea+paraquat (post)	• G/4 B/7
• Control	• G/0.5 B/5.5

Vine crops & plastic mulch programs

- Preplant
 - Command
 - Curbit
 - Strategy (a combo of the above two)
 - Sinbar (watermelon)
 - Sandea (?)
- May combine with a burndown
 - glyphosate
 - paraquat
- Postemergent
 - Sandea & a grass herbicide (Poast or Select)
 - Could use a shielded application of glyphosate or Aim

That's all folks!

Chemical Weed Management Options

Melons and Cucurbits

Curbit (pre) and Sandea (Crop at 2-5 leaf)

- apply as banded spray between rows
- Sandea – broadleaf weeds control 1-3" Good on nutsedge and cocklebur
- Curbit – good on grasses and small broadleaves for 3-4 weeks

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Chemical Weed Management Options

- Cost per Acre
 - Sandea - \$20 - 40.00
 - Curbit - \$20 - 30.00
 - Poast + COC - \$9 -14.00

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Quality example of pumpkin weed control

- Command & glyphosate preplant
- Gramaxone spot sprayed around pumpkins just before they began to runner



Plastic mulch & fruiting crop herbicide treatments







Plastic laid June; tilled again 7/15

Tomatoes

pre 7/20; post 8/14

- Dual+paraquat (pre) & Sandea+paraquat (post)
- Glyphosate (pre) & (post) 'as needed'
- Mow
- Sencor+paraquat (pre) & Sandea+Poast (post)
- Glyphosate (pre) & straw after
- Paraquat (pre) & Sandea+paraquat/Poast (post)

Tomatoes


Sencor/Sandea	Paraquat/Sandea	Dual/Sandea
		
		

Fruiting crops & plastic mulch programs

- Preplant
 - Command (peppers)
 - Dual M II (tomatoes)
 - Prowl
 - Sandea (?)
- May combine with a burndown
 - glyphosate
 - paraquat
- Postemergent
 - Sandea & a grass herbicide (Poast or Select)
 - Sencor (as above)
 - Could use a shielded application of glyphosate, paraquat or Aim

Limitations for small area applications of herbicides with residual activity

- Correct coverage (of soil surface) with bigger droplet size
- Complete coverage on row middles (up to edge of plastic)
- Getting the correct amount of product on a given area
- Drift if not using shields



Timing is everything!



Timing is everything!



Comments from 4 growers

- Weeds were more trouble the last two years because of all the rain. Usually one or two shots of glyphosate keeps our row middles in good shape
- We sprayed our fields up to four times this year with glyphosate. The boys' sometimes put a preplant herbicide in, but its mostly glyphosate.
- I mow my row middles (for tomatoes) and when the crabgrass got bad, sprayed with glyphosate. The crabgrass laid down like a mulch mat.
- I spray with glyphosate right when the melons are ready to run off the plastic, and then again (if needed) just in the (row middle) centers a week or so later. I'm used to seeing a little leaf yellowing on the vines & know they'll grow out of it



Final comments

Glyphosate

- Simplicity
- Drift & droplet size
- Spray it again Sam (& again, & again in a wet year)
- Some type of shields, even homemade, are good
- Timing

A few versatile products to have 'on hand'

- Command
- Dual Magnum II
- Sandea
- Poast or Select
- Atrazine
- 2,4-D
- More?
 - Prowl
 - Curbit