

WHAT CAUSES WEEDS?: WHY I FAIL AT NURSERY FIELD WEED CONTROL

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WHAT CAUSES WEEDS?

Hardpan



Poor Practices

Inherited

Bonus

Bring in

Wet SMARTWEED FAMILY (POLYGONACEAE) Curly Dock - *Rumex crispus*

Ocrea

Perennials – seed only Common weed =13,000 to 100,000 seeds/ year Dormant – Viable 30 years

SMARTWEED FAMILY (POLYGONACEAE)



Sheep sorrel – *Rumex acetosella Perennial – seed and spreading horizontal roots*

SEDGE FAMILY (CYPERACEAE)

Yellow Nut Sedge Cyperus esculentus





Grass like
 Triangular stems
 Leaves 3's – pointing outward in 3 directions

Triangular stem





Buttercup

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Horsetail

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Tile Drainage

Header = 6-8" pipe Lines = 4" pipe

A. Brown Nursery

Space 25-50' apart 30' in heavier soils

Drainage very important

FIELD TILES

- FIELD TILE MAINS ARE ROUTED TO UNDERGROUND STORAGE TANKS AND PUMPED BACK TO PONDS
- PROVIDES
 ADDITIONAL WATER
 FOR IRRIGATION



Dry & Low Fertility Spurge Family (Euphorbiaceae)

PROSTRATE SPURGE Euphorbia maculata

Summer annual Low growing, mat-producing

Distinguished by: Latex exudate when stems broken Opposite leaves Heavy seed production

2/19/2016







Field Bindweed – Convolvulus arvensis





Wild Buckwheat

Hedge Bindweed

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White Clover – Trifolium repens

Low fertility

LEGUME FAMILY (LEGUMINOSEA)

Low fertility

Broad-leaved Plantian, *Plantago major* – **Plantaginaceae**



Perennial – only by seed Stemless except for leafless flower stalks Second most common lawn weed

Narrow-leaved plantain Plantago lanceolata



Dandelion - Taraxacum officinale





Tap root can penetrate areas too compacted for any other plant

WILD GARLIC

- Bulblets = flat on one side
- Crush bulbs or stems = strong garlic scent
- Seeds ripen August to Sept.



Wild onion has no offset bulblets.











Spading Machine Rotating – spades

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Bill Hendricks, Klyn Nurseries Inc.

Break-up hard pan

Best done in a lattice type pattern

Shovel Plough – Sub-soiling 2 feet deep; 3.5-4ft apart

WHY I FAIL AT NURSERY FIELD WEED CONTROL

"I haven't failed. I've just found 10,000 ways that won't work."

Thomas Edison

Not bringing in with soil amendment or plants

 Not using same herbicide repeatedly or some other flawed practice

Fixed drainage, compaction and fertility

A. Proper Timing – Too Late, Too Early B. Proper Use

Chemical Failures

c. Selectivity – Wrong HerbicideD. Weed Confusion

I DUNNO MAN O O I'M SO CONFUSED

•MITÓSIS INHIBITORS - MOA ROOT INHIBITORS

DINITROANILINE

Group 3

PYRIDINE

BENZOIC ACID

BARRICADE 65WG PENDULUM 2G, PENDULUM 3.3 EC PENDULUM AQUA CAP PROWL H₂0 3.8 CS PRE-M 60DG CORRAL SURFLAN AS T/O TREFLAN EC TREFLAN QR5 OH II O

ROUT

SNAPSHOT 2.5TG

DIMENSION

PRODIAMINE PENDIMETHALIN PENDIMETHALIN PENDIMETHALIN PENDIMETHALIN PENDIMETHALIN PENDIMETHALIN ORYZALIN TRIFLURALIN TRIFLURALIN OXYFLUORFEN + PENDIMETHALIN

ORYZALIN + OXYFLUORFEN

ISOXABEN + TRIFLURALIN

DITHIOPYR

DACTHAL

DCPA

MITOSIS INHIBITORS - MOA

SHOOT INHIBITORS (INHIBITS VLCFAS):

PENNANT MA CHLOROACETANILIDE TOWER Group 15 FREEHAND

ACETAMIDE

KERB 3.3 SC KERB 50 W

DEVRINOL 50 DEVRINOL 10



Proper Use



Incorporate with irrigation or rainfall Do NOT incorporate with drip irrigation!!!





RAINFALL MAY CHANGE HERBICIDE EFFECTIVENESS

MAINTAIN THE CHEMICAL BARRIER

- DISTURBING THE BARRIER = FAILURE
- i. REDUCE UNNECESSARY TRAFFIC
- ii. HAND WEEDING, CULTIVATION
- iii. REDUCE EXCESSIVE IRRIGATION

OR RAINFALL - LATER



PPO INHIBITORS (GROUP 14)

DIPHENYLETHER **GOAL 2XL GOAL TENDER** OH II ROUT **BIATHALON** OXADIAZOLE **RONSTAR 50 WSP** N-PHENYLPHTHALIMIDE **BROADSTAR G** SUREGUARD WDG TRIAZOLINONE F6875, ECHELON

OXYFLUORFEN OXYFLUORFEN OXYFLUORFEN+PENDIMETHALIN ORYZALIN + OXYFLUOROREN OXYFLUORFEN + PRODIAMINE

OXADIAZON

FLUMIOXAZIN FLUMIOXAZIN Broadleaves

SULFENTRAZONE + PRODIAMINE



Nitrile Group 20

Alkylazine

Group 29

Casoron 4G

Dichlobenil

Alion -Orchard Specticle -Landscape Marengo G -Nursery Indaziflam

* PREEMERGENCE EFFECTED BY SOIL:

- SOIL TYPE (SAND, GRAVELLY SOILS, CLAY) -CEC
- CLAY ↑ ADSORPTION VS. SAND = ↑ HERBICIDE RATES NEEDED IN CLAYS
- >O.M. CONTENT ↑ ADSORPTION, MANY HERBICIDE INEFFECTIVE IN ↑ OM SOILS

PREEMERGENCE EFFECTED BY:

>MICROBIAL ACTIVITY

 Long residual herbicides – Diuron (Karmex), atrazine(<below 75 F°), (some not used in Northern regions)
 High pH (above 7.0) = more persistent

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◆ PREEMERGENCE EFFECTED BY:

TEMPERATURE VOLATILITY – TREFLAN, CASORON, GOAL PHOTODECOMPOSITION – INCORPORATE AFTER APPLICATION -DIURON

2/19/2016

LIQUIDS DECIDUOUS TREES:

- GALLERY + SURFLAN (2 QT.)
- GALLERY + BARRICADE (RATE -SEE BELOW)
- SUREGUARD 5 OZ. FALL & 4 OZ. SPRING
- GALLERY ¾ LB. FALL AND ½ LB. SPRING (GOOD TILL AUGUST)

Year	Season	Chemical	Rate /ac
1/4	Fall	Goal 2XL + Barricade	48 oz. + 21 oz.*
	Spring	Tower + Pendulum Aqua Cap	21 oz. + 64 oz.*
<mark>2/</mark> 5	Fall	SureGuard	5 oz.; 12 oz.*
	Spring 🔰	Marengo SC	15 oz
3/6	Fall	Princep 4L (3 lb./ac)	3 qt.
	Spring	Gallery + Barricade	1.3 lb. + 21 oz.

1 quart = 32 oz

WEED SCOUTING FOLLOWING SPRING APPLICATIONS

- LATE SUMMER OR EARLY FALL : Wrong Weed
 → NOTE:
- ✓ SUMMER ANNUALS THAT ESCAPED -SPRING PHYSICAL OR CHEMICAL CONTROLS
- ✓ PERENNIALS AND WINTER ANNUALS THAT HAVE PERSISTED FOR THE SEASON
- WHAT CHANGES (TIMING, METHOD) TO MAKE TO YOUR CURRENT WEED CONTROL PROGRAM

WEED SCOUTING FOLLOWING YOUR FALL APPLICATIONS:

2. LATE SPRING OR EARLY SUMMER :

Wrong Weed

→ NOTE:

- WINTER ANNUALS THAT ESCAPED FALL PHYSICAL OR CHEMICAL CONTROLS
- PERENNIALS THAT WERE MISSED WITH THE FALL PREEMERGENCE
- ✓ WHERE NOW DO YOU NEED ADDITIONAL CONTROL -"CAREFUL" POSTEMERGENCE OR PRE



Post - 2008

- Cut weed program
- Now very overgrown
- Attempt to clean middle two rows
- Severe weed
- Even if they had the labor, could not afford pre -2008 hand weeding costs

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<mark>2/</mark> 5	Fall		SureGuard	5 oz.; 12 oz.*
	Spring	×	SureGuard + Surflan	4 oz. + 2 qt.
3/6	Fall		Princep 4L (3 lb./ac)	3 qt.
	Spring	×	Gallery + Barricade	1.3 lb. + 21 oz.

1 quart = 32 oz



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Something Tougher!

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Field pepper-grass – *Lepidium campestre*

Distinctive notch between wings

Annual or biennial

Clasping, arrow-head shaped bases



Common pepper-grass *Lepidium densiflorum*

Russian Thistle

Flowers – June to August Winter annual When matures – plants become brittle and easily break off, rolling and scattering seed



INGREDIENT:

 Marengo SC - Suspension concentrate formulation - 2012
 Marengo G – Granular formulation -2013

Long-lasting - soil degradation 150 days Low application rate

Philadelphia Fleabane – Erigeron philadelphicus



Control with SureGuard + Dimension

Creeping Perennial – seed, stolons, basal offsets

Control with SureGuard + Dimension

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Control with Marengo SC

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Control with Casoron 4G – 150#/ac

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Buxus 'Green Velvet' V10233, Round 1 at 26 WAT

<u>V-10233 - Fierce</u>

(Flumioxazin 33.5% + Pyroxasulfone 42.5%)

Nufarm Americas Inc., Alsip, IL Flumioxazin is currently labeled for the nursery and landscape - BroadStar (the granular formulation) or SureGuard (liquid formulation).

Pyroxasulfone is a new chemistry in the isoxazoline family - inhibits very long chain fatty acids Currently labeled for use in corn and soybeans.

2013 OH RESULTS

Weed control

Treatment	Rate/ac	1 WA	Т	2 WA	T	4 W/	١T	1 WA 2	2 T	
V-10336	7.5 oz	10.0 ^{wv}	а	9.6	ab	8.8	bc	5.4	b	
V-10336	15 oz	10.0	а	9.8	ab	9.5	ab	6.4	ab	
V-10336	30 oz	10.0	а	9.9	а	10.0	а	7.5	a	
Tower + Pendulum	32 oz + 2 qt	9.5	b	7.7	с	8.4				- 11. M
SureGuard	12 oz	10.0	а	9.7	ab	9.5	San			NALLAN ANALAN
		9.9	а	9.1	b	9.3				
SureGuard	6 oz							2. 金子水		-14.
Untreated		9.2	С	7.8	С	7.7				

w = Weed control ratings based on a 0-10 scale wi control and 10 perfect weed control with ≥7 comm

v = Treatment means followed by the same letter i are not significantly different based on LSmeans



CANADA THISTLE – LONTREL APPLICATION MARCH, 2015 – CLEAN AFTER 4 WEEKS

10 weeks

2/19/2016

Something Different

Dormant

<u>ower</u>

° Objectives

- Evaluate phytotoxicity on three fields at each of three locations in Ohio:
- Studebaker Nurseries, Inc., New Carlisle, OH, 45344
- Wm A Natorp Co., Mason, OH, 45040
- Herman Losely and Son, Inc., Perry, OH, 44081

2. Evaluate efficacy in the surrounding bed With over the top applications on dormant growth.

MATERIALS AND METHODS

- Treatments were applied December 11, 2014 and March 12, 2015 - Round #1 and #2, respectively
- Liquid applications were applied over the top of dormant:
- Buxus 6B, Fall 2013, 1yr.
- Taxus 6B, Fall 2013, 1 yr.
- Buxus 'Green Gem', Fall 2011, 3 yr.
- Four replications/treatment and three subsamples/replication arranged in a CRD - linearly down the row of each species; one guard on each side i.e. five plants/plot

MATERIALS AND METHODS

1. Control

- 2. Echelon (F6875) = Sulfentrazone + prodiamine 0.75 lb a.i./ac
- 3. Lontrel = Clopyralid 16 oz/ac
- 4. Dimension 2EW + Gallery SC = Dithiopyr
 0.5 lb ai/A + Isoxaben -1.0 lb/ac
- 5. Certainty = Sulfosulfuron 7.5 fl oz/ac

MATERIALS AND METHODS

- 6. Marengo = Indaziflam 15 oz/ac
- 7. SedgeHammer Plus 5% Halosulfuron = Halosulfuron-methyl 2 oz/ac
- 8. Casoron CS = Dichlobenil 15% 3 gal ai/ac
- 9. SureGuard = Flumioxazin 12 oz/ac
- 10. V10233 = *Flumioxazin* + *pyroxasulfone* 15 oz/ac

MATERIALS AND METHODS Treatments were evaluated at :

- **Round #1** Evaluation Dates
- 1. 2 WAT 12/26/2014
- 2. 13 WAT 03/12/2015
- 3. 16 WAT 04/01/2015
- 4. 19 WAT 04/21/2015
- 5. 21 WAT 05/08/2015
- 6. 26 WAT 06/08/2015
- 7. 28 WAT 06/22/2015





	Crop	Round	Best Herbicide	
RESULT	Buxus 1 yr. 6B	1 – Table 2	Casoron CS SureGuard V10233 Lontrel	
		2 – Table 3	Marengo SC V10233 Certainty	
	Taxus 1 yr. 6B	1 – Table 2	Marengo SC Casoron CS SureGuard V10233	
		2 – Table 3	Marengo SC	
	Buxus 3 yr. 11A	1 – Table 2	Casoron CS Marengo SC V10233 SureGuard	
		2 – Table 3	Casoron CS Marengo SC V10233 SureGuard	

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Herbicide	Ratio Round 1:2	
Casoron	3:1	
Marengo SC	2:3*	
Lontrel	1:0	
V10233	3:2*	
SureGuard	3:1	0

CONCLUSIONS

Round 1: December Applications: Casoron CS = best -- providing commercial control 28 and 26 WAT, depending on the crop. Casoron CS was followed by Marengo SC with commercial control at 26 and 21 WAT, depending on crop. **Casoron and SureGuard – December Round 2: March Applications:** Marengo SC = best -- providing commercial control 15 and 13 WAT, depending on crop Marengo SC was followed by V10233 with commercial weed control 13 WAT in two of three crops.

Marengo SC - March

ACKNOWLEDGEMENTS

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THANK YOU

- DOW AGROSCIENCES
- NUFARM AMERICAS
- OHP
- STUDEBAKER NURSERIES
- WM. A. NATORP CO.
- HERMAN LOSELY AND SON NURSERIES



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WEED CONTROL

COLD HARDINESS

- APPLICATION TECHNOLOGIES
- APPLICATION TIMING
- TRIALS DIFFICULT WEEDS OR SITES
- EXPERT WITNESS