“Organic” Lawncare

Dave Gardner, gardner.254@osu.edu
What is Organic?

- Natural
- Non-toxic
- Low impact
- Minimum risk

Natural / Organic Weed Control Products

- Non-selective
  - Various plant oils
  - Horticultural Vinegar
  - Herbicidal Soaps
  - Pelargonic acid

Scythe

- Pelargonic Acid
- EPA Biopesticide
- Non Selective
- Very fast acting
Weed Control with Cinnamon Oil† - OSU

Weed Control with Rosemary Oil† - OSU

Natural / Organic Weed Control Products

Non-selective
- Various plant oils
- Horticultural Vinegar
- Herbicidal Soaps
- Pelargonic acid

Selective
- Corn Gluten Meal
- Chelated iron
- A.D.I.O.S.
- Halo
**Corn Gluten Meal**

Byproduct of wet milling process of corn

10% nitrogen by weight

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**Turf Quality at 60 DAT in 2018**

- Untreated
- CGM 20 lbs / 1000 ft²
- CGM 40 lbs / 1000 ft²

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**Turf Quality at 60 DAT in 2019**

- Untreated
- CGM 20 lbs / 1000 ft²
- CGM 40 lbs / 1000 ft²
Kentucky Bluegrass Germination 21 Days after Seeding

Crabgrass Germination 9 Days after Seeding
Corn Gluten Meal

- Bioactive Dipeptides
- Water soluble
- Less effective in year 1

Crabgrass control >85% has been observed in 2nd and subsequent years of use

20 lbs CGM / 1000 ft²

CFAES

20 lbs / 1000 ft²
CGM +
0.46 oz / 1000 ft²
pendimethalin

CFAES
**Corn Gluten Meal Study**

Initiated in 2018 and will continue 3 years

2 brands of CGM applied May 1 each year

- 20 lbs per 1000 ft²
- 40 lbs per 1000 ft²
- 5 lbs per 1000 ft² applied weekly for 4 weeks

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**Crabgrass Cover 120 DAT**

Untreated

CFAES

CGM 40 lbs
CGM 20 lbs
Control Plot
CGM 20 lbs

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CFAES

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CFAES

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CFAES
How to Use Corn Gluten Meal

- Spring application for crabgrass
- Fall application for broadleaf weeds

- 20 lbs product per 1000 square feet
  - 10% N by weight
  - 2 lbs N per 1000 square feet
Chelated Iron

Selective because iron is more toxic to broadleaf plants than to grasses

Can discolor turf in warm weather

Several products available

Some Chelated Iron Containing Products

- Fiesta
- Iron X
- Natria

All are 26.52% Iron HEDTA
Typical rate 25.2 fl oz / 1000 ft² and 240 GPA

Fiesta Studies

Tested two application schedules
- Two fall applications + two spring applications
- Three applications in the spring

1.25, 2.5, or 5 gallons per 1000 square feet
2%, 4%, or 8% solution
Fiesta

Dandelion
White clover

Applied: Sept 20, Oct 11
4% Solution
5 gal per 1000 ft²

September 20

CFAES

Fiesta

Dandelion
White clover

Applied: Sept 20, Oct 11
4% Solution
5 gal per 1000 ft²

September 21 (1 DAT)

CFAES
**Fiesta**

- **Dandelion**
- **White clover**
- Applied: Sept 20, Oct 11
- **4% Solution**
- 5 gal per 1000 ft²

**Fiesta Herbicide Recommendations**

- Better on dandelion, white clover, and ground ivy
- Not as effective on plantain
- Control with 3 apps in spring ≥ 2 in fall & 2 in spring
- Control is a function of amount applied
  - 2.5 gal of 8% = 5 gal of 4%

**Corn Gluten Meal + Fiesta Study**

- Initiated in 2018 and will continue 3 years
- CGM 20 lbs per 1000 ft² applied April 10
- Fiesta 5% applied at 4 gal per 1000 ft²
  - March, April, May
  - April, May, June
  - May, June, July
Weed Cover on August 14

Untreated

CGM 20 lbs/M applied April 10

Weed Cover on August 14

Fiesta (5%, 4 gal/M) Applied May 15, June 15, July 15

CGM 20 lbs/M applied April 10 + Fiesta (5%, 4 gal/M) Applied May 15, June 15, July 15

A.D.I.O.S.

NaCl

Application rate = 183 lbs / acre

Contact with some systemic activity

Labelled for selective control of broadleaf weeds
Untreated A.D.I.O.S.

Dandelion and Clover Cover
July 24, 2013

A.D.I.O.S.

NaCl applied at 183 lbs / acre
Should conduct a soil test and monitor soil Na levels prior to and after use

Halo Herbicide

ICT Organics
Marketed as effective on dozens of weed species
No phytotoxicity to turfgrass
**Multi-State NCERA Organic Herbicide Trial**

10 Locations - Spring and Fall trials

12 Treatments
- Chelated Iron (5 product / rate combinations)
- A.D.I.O.S.
- Halo

Dandelion, white clover were target weed species

### Dandelion Control (Spring Trial)

<table>
<thead>
<tr>
<th></th>
<th>Day 7</th>
<th>Day 18</th>
<th>Day 28</th>
</tr>
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<tbody>
<tr>
<td>A.D.I.O.S.</td>
<td>56</td>
<td>50</td>
<td>64</td>
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<tr>
<td>Halo</td>
<td>51</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>Iron X</td>
<td>74</td>
<td>-25</td>
<td>-40</td>
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<tr>
<td>Trimec</td>
<td>56</td>
<td>44</td>
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</table>

### White Clover Control (Spring Trial)

<table>
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<th>Day 7</th>
<th>Day 18</th>
<th>Day 28</th>
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</thead>
<tbody>
<tr>
<td>A.D.I.O.S.</td>
<td>49</td>
<td>46</td>
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<tr>
<td>Halo</td>
<td>68</td>
<td>55</td>
<td>57</td>
</tr>
<tr>
<td>Iron X</td>
<td>13</td>
<td>50</td>
<td>71</td>
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<tr>
<td>Trimec</td>
<td>41</td>
<td>56</td>
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Multi-State NCERA Organic Herbicide Trial

10 Locations - Spring and Fall trials
12 Treatments
  Chelated Iron (5 product/rate combinations)
    A.D.I.O.S.
    Halo
2 Applications – 28 Day Apart (Except Trimec - applied once)

Dandelion Control (Spring Trial)

White Clover Control (Spring Trial)
Weeds in Untreated Control (Fall Trial)

Weed Populations Prior to Fall Trial

Weed Control at 7 DAT
Weed Control at 14 DAT

A.D.I.O.S. Halo Iron X Trimec

Weed Control at 21 DAT

A.D.I.O.S. Halo Iron X Trimec

Summary of Weed Control Options with Organic and Synthetic Herbicides

<table>
<thead>
<tr>
<th>Weed Type</th>
<th>Organic</th>
<th>Synthetic</th>
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<tbody>
<tr>
<td>Annual Grasses</td>
<td>Pre</td>
<td>Pre/Post</td>
</tr>
<tr>
<td>Perennial Grasses</td>
<td>*</td>
<td>*** Post/NS</td>
</tr>
<tr>
<td>Sedges</td>
<td>*</td>
<td>***** Pre/Post</td>
</tr>
<tr>
<td>Annual Broadleaves</td>
<td>**** Pre/Post</td>
<td>**** Pre/Post</td>
</tr>
<tr>
<td>Perennial Broadleaves</td>
<td>*** Pre/Post</td>
<td>**** Post</td>
</tr>
</tbody>
</table>
Compared to Synthetic Herbicides, Organic Herbicides:

Can be just as effective
- Corn gluten meal is more effective on high cut turf
- Multiple years of corn gluten meal use is required
- Multiple applications of chelated iron, A.D.I.O.S. or Halo are required for lasting control of perennial weeds

Are more expensive

Insect Control

Bluegrass Billbug
Cultural Insect Control Strategies

Endophytic turfgrasses
• Root infecting fungi
• Fescues
• Ryegrasses
• High endohypte level not necessarily correlated to high overall turf quality
Biological Insecticides

- *Steinernema carpocapsae*
- Azadirachtin
- *Bacillus thurengiensis*
- Spinosad

Various modes of action
Not all are safer than chemical insecticides

Disease Management

- Synthetic isoparaffin
- Induced Systemic Resistance
- Broad Spectrum
Keys to Natural Organic Lawns

Healthy Soil
Turfgrass species selection
Proper cultural practices
Weed control
  • Cultivation, flamers
  • Organic herbicides
Insect and disease control

Integrating Microclover with Turfgrass to Produce a More Environmentally Sustainable Turfgrass Ecosystem

What is an Ecolawn?

• Low input alternative to turfgrass
• Grasses (fescues) and broadleaf plants (clover, microclover, etc)
  Less water
  Little to no fertilizer
  Stays green in summer
Agronomic Conclusions

- Better overall quality and weeds were suppressed for about 2 years
- Weeds began to encroach in year 3
- There are no selective herbicides that are safe to clover, so selective removal of broadleaf weeds from clover is not possible.

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