Turf essentials:
Lawn weed control

Zac Reicher
http://turf.unl.edu/
Cultural practices for thick turf

- Highest mowing height
- Mow frequently
- Reduce irrigation
- Fertilize primarily in the fall
- Manage traffic/compaction

Managing resistance

- Maximize cultural controls
- Use high label rates
- Alternate modes of action

2,4-D susceptible

2,4-D tolerant

After 2,4-D app and regrowth

After 2nd 2,4-D app and regrowth
After 3rd 2,4-D app and regrowth

Effect of Drive or Tenacity on late-season crabgrass in a driving range tee and adjacent golf course rough. Initial applications made on 25 Aug 2008 and MSO included at 1.5 pts/A on all Drive apps other than where stated (Purdue 2008).

Crabgrass

- Summer annual
  - Germinates in spring
  - Sets seed in summer
  - Dies with frost
- Can produce 150 tillers and 150,000 seeds per plant
- 1,000 seeds/plant X 10% viable = 100 germinating seeds
- 100 germinating seeds X 95% control = 5 plants where 1 was last summer
August crabgrass control from April-applied preemergence herbicides over three years in studies at Purdue University. Applied to low-mowed Kentucky bluegrass to encourage crabgrass.

![Image of crabgrass]

**Effect of formulation and rate of Dimension on crabgrass control over two years (UNL, 2014)** (apps made late Apr fb late June)

![Graph showing effect of formulation and rate of Dimension on crabgrass control]

**PRE/fertilizer combos**

- Watch the N rate!
- Increase slow release % with rates >0.7 lbs N/1000
- Most cool-season lawns require little N in spring
- Cannot reduce N rate without reducing PRE rate
- Granule size
Granule size??

Big and heavy?
Small and light?

Watering in PRE’s??

Yes?
No?

Granular size effects on PRE crabgrass control

<table>
<thead>
<tr>
<th>Size particles/gram</th>
<th>Barricade</th>
<th>Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>23</td>
<td>43</td>
<td>66</td>
</tr>
<tr>
<td>58</td>
<td>71</td>
<td>75</td>
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<tr>
<td>165</td>
<td>74</td>
<td>75</td>
</tr>
<tr>
<td>465</td>
<td>81</td>
<td>84</td>
</tr>
<tr>
<td>1310</td>
<td>82</td>
<td>82</td>
</tr>
<tr>
<td>3728</td>
<td>83</td>
<td>75</td>
</tr>
<tr>
<td>10,606</td>
<td>83</td>
<td>82</td>
</tr>
</tbody>
</table>

(Mississippi State 1999)
Effect of watering-in PRE's applied very early May 2012 in Mead, NE (UNL 2012).

Fate of a Preemergence Herbicide

Timing of PRE’s?

- “Apply 2 weeks prior to expected germination”
- “Crabgrass germinates when soil temperatures are above 50-55°F for 5 days”
- “Apply when forsythia are blooming”
- Better to apply early than late

Crabgrass control on July 15 from PRE’s applied on 6 different dates in fall/spring. (Averaged over three years, UNL 2013)
Sequential applications of PRE’s

- Most effective in tough crab areas
- Generally ½ + ½ or ¾ + ½ (check label)
- Previously thought that same ai should be used for both apps

Changing ai for sequential

- More convenient
- Maybe more economical
- Expand the spectrum: Pendimethalin, prodiamine are a little better with summer annual broadleaves than dithiopyr
- Could use dithiopyr for the sequential (late May-June) app regardless what or if PRE was applied in previous round to pick up germinating crabgrass in hotspots

Bottom line on PRE’s

- Thick turf
- Water-in/rain if possible
- Don’t skimp on the rates
- App timing is flexible (within reason and especially with sequential apps)
- Sequential apps improve control regardless of ai’s used
POST emergence options

- Smaller the crabgrass, the more effective
- Multiple apps may be needed for most effective and/or extended control
- Combine with PRE in early apps
- Do not apply to moisture- or heat-stressed turf

Aug 15 2008 seeding on Sept 15, 2008
100% crabgrass cover

POST emergence options

- Dithiopyr
  - Dimension plus other post-patents
- Quinclorac
  - Drive plus other post-patents
  - SquareOne (with carfentrazone)
  - Solitaire (with sulfentrazone)
  - Onetime (with MCPP & dicamba)
  - Q4 Plus (with sulfentrazone, 24D, & dicamba)
- Fenoxaprop
  - Acclaim
  - Last Call (with fluroxypyr and dicamba)
- Mesotrione
  - Tenacity
POST emergence options

- Untilled
  - Dithiopyr
  - Quinclorac
- Tillered (multiple apps most effective)
  - Quinclorac (usually)
  - Fenoxaprop
  - Mesotrione

Crabgrass options in cool-season seedings

- Tenacity
  - PRE on bare soil
  - POST over turfed areas, 28 days after emergence
- Drive
  - POST 28 DAE
- SquareOne (Quinclorac+carfentrazone)
  - POST 7 DAE
- Dithiopyr
  - Early POST with residual
  - “…developed a good root system and a uniform stand, and have received at least two mowings”

Crabgrass control in newly-seeded buffalograss

- PRE: Tenacity in seedbed plus one or two apps starting 2-4 weeks after emergence
- Post: 0-4 weeks after emergence
  - Drive XLR8
  - SquareOne
  - Tenacity

TF cover 6 weeks after emergence (UNL 2011)

KBG cover 6 weeks after emergence (UNL 2011)
Life cycles

- Perennials
  - Germinates anytime and will persist for years
- Summer annuals
  - Germinates in spring, sets seed in summer and dies with frost
- Winter annuals
  - Germinates in fall, sets seed in spring and dies with summer heat
- Biennials
  - Germinates anytime, stays as a rosette the first year, bolts, sets seed, and dies in second year
Postemergence ai’s

- 2,4-D (many names, often with other herbicides)
- dicamba (Banvel)
- MCPB, mecoprop (many brands)
- MCPA (many)
- dichlobenil
- triclopyr (Turflon Amine, Turflon Ester)
- clopyralid + triclopyr (Confront)
- clopyralid (Contral)
- fluoroxypr (Spotlight)
- quinclorac (Drive)
- metsulfuron methyl (Manor)
- mesotrione (Tenacity)
- halosulfuron (Sedgehammer)
- carfentrazone-ethyl (Quicksilver, Speed Zone, Power Zone)
- sulfentrazone (Surge, Q4, Dismiss)
- penoxalum (LockUp)
Preemergence ai’s

- Isoxaben
  - Gallery (Snapshot)
  - Isoxaben

Broadleaf weed control

- Sep-Nov is best!!
  - Controls most life cycles
  - Moves with photosynthate to the roots as weeds prepare for winter
  - Fewer ornamentals to damage
  - Allows turf to fill in holes left by weeds
  - Early apps less effective than late apps
Minimize spring broadleaf control

- High risk of damage to trees, shrubs, ornamentals, vineyards, etc.
- Direct exposure with drift in high winds
- Volatilization and off-site movement
- Difficult to prove cause but blanket blame is on turf industry professionals and DIYs

Three-year mean of ground ivy control in June from herbicides applied on various dates the previous fall (Purdue 2007).

Fall broadleaf weed control on various application dates, rated in the fall and following spring. (Michigan State Univ. 1988)
Broadleaf weed control - spring

- Ester formulations work better in cool weather
- But are more expensive and more volatile leading to more offsite movement
- A few weeks before or after flowering in spring is better than at flowering
- No earlier with traditional chemistry

**Effect of spring application timing of 24D ester on dandelion control in June (Purdue 1992)**

- 150 GDD50 for ester formulations
- 225+ GDD50 for amines
- Dow’s Defendor can be applied in Fall or March-April to limit dandelions, etc.
  - Useful on new accounts
  - Useful on schools, etc. that prefer not to use phenoxies

**Effect of spring application timing of 24D ester on dandelion control in June (Purdue 1992)**
Effect of spring application timing of 24D ester on dandelion control in June (Purdue 1992)

[Graph showing the effect of GDD(50) on % Control (June)]

Summer annuals
- Knotweed, purslane, oxalis, etc.
- Most problematic in thin turf next to walks, drives, cart paths, etc.
- Often germinate early and continue to germinate into summer
- Single app of Gallery (isoxaben)
- Multiple apps of POST

Percent control of prostrate knotweed from applications made 20 May 2014 (UNL 2014)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>4 June</th>
<th>18 July</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trimec Classic 3 pt/A</td>
<td>65 a</td>
<td>70 ab</td>
</tr>
<tr>
<td>24D + MCPA + dicamba</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trimec Classic 4 pt/A</td>
<td>64 a</td>
<td>61 b</td>
</tr>
<tr>
<td>24D + MCPA + dicamba</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Escalade 2.5 pt/A</td>
<td>80 a</td>
<td>97 a</td>
</tr>
<tr>
<td>24D + fluroxypyr + dicamba</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Untreated (actual cover)</td>
<td>0 b</td>
<td>0 c</td>
</tr>
<tr>
<td>(75)</td>
<td></td>
<td>(97)</td>
</tr>
</tbody>
</table>

Yellow nutsedge
- Germinates from tubers in early summer
- Spreads via rhizomes throughout summer
- Dies with frost
- Tubers can lie dormant for many years
- Tubers will regerminate multiple times if young plants are killed

[Image of Yellow nutsedge control]
Yellow nutsedge

- Basagran, Sedgehammer, Certainty, or Dismiss at best starting in late May-June
- Early applications may trigger regermination of tubers
- Multiple apps are most effective
- “Preemergence” doesn’t work
- Escelon (Dismiss + Prodiamine) at traditional crabgrass timing (early May)?

Control of yellow nutsedge with Sedgehammer or Dismiss applied on 3 June or 15 July, 2013.

<table>
<thead>
<tr>
<th>Rate/1000</th>
<th>App date</th>
<th>% Control</th>
<th>Rate/1000</th>
<th>App date</th>
<th>% Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sedgehammer 0.03 oz</td>
<td>June 3</td>
<td>90 ab</td>
<td>Sedgehammer 0.03 oz</td>
<td>June 3</td>
<td>90 ab</td>
</tr>
<tr>
<td>Sedgehammer 0.03 oz</td>
<td>July 15</td>
<td>93 ab</td>
<td>Sedgehammer 0.03 oz</td>
<td>July 15</td>
<td>93 ab</td>
</tr>
<tr>
<td>Sedgehammer 0.03 oz</td>
<td>June 3</td>
<td>97 a</td>
<td>Sedgehammer 0.03 oz</td>
<td>June 3</td>
<td>97 a</td>
</tr>
<tr>
<td>Sedgehammer 0.12 fl oz</td>
<td>June 3</td>
<td>22 cd</td>
<td>Sedgehammer 0.12 fl oz</td>
<td>June 3</td>
<td>22 cd</td>
</tr>
<tr>
<td>Sedgehammer 0.12 fl oz</td>
<td>July 15</td>
<td>16 cd</td>
<td>Sedgehammer 0.12 fl oz</td>
<td>July 15</td>
<td>16 cd</td>
</tr>
<tr>
<td>Sedgehammer 0.03 oz</td>
<td>June 3</td>
<td>97 a</td>
<td>Sedgehammer 0.03 oz</td>
<td>June 3</td>
<td>97 a</td>
</tr>
<tr>
<td>Sedgehammer 0.12 fl oz</td>
<td>June 3</td>
<td>33 c</td>
<td>Sedgehammer 0.12 fl oz</td>
<td>June 3</td>
<td>33 c</td>
</tr>
<tr>
<td>Sedgehammer 0.12 fl oz</td>
<td>July 15</td>
<td>67 b</td>
<td>Sedgehammer 0.12 fl oz</td>
<td>July 15</td>
<td>67 b</td>
</tr>
<tr>
<td>Sedgehammer 0.03 oz</td>
<td>July 15</td>
<td>98 a</td>
<td>Sedgehammer 0.03 oz</td>
<td>July 15</td>
<td>98 a</td>
</tr>
<tr>
<td>Untrated Check</td>
<td>0(32%) d</td>
<td>0(32%) d</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Perennial grasses are considered weeds when they attain a height of at least six inches because of different value, safety, or growth habit compared to desired turf. Perennial grasses are difficult to identify and even identified, are extremely difficult to control in many cases. The effectiveness of postemergence herbicides can vary greatly and multiple applications per year with increased rates may be required to control these weeds. Benzimidazoles are used for such difficult to control grasses, and their use will vary depending on your lawn. In many cases, perennial grasses should simply be tolerated in turf because they are too difficult or expensive to control effectively.

Perennial grasses can be grouped by their growth habit. Cool season grasses are those that grow fast during cooler temperatures. Infections of CTV will become easily visible from midsummer to late fall in cool soil temperatures. Cool season grasses, like tall fescue, with a robust growth habit and often results from cool temperatures. Both tall fescue and redtop grasses are cool season grasses.

When there are brown or yellow patches, bermudagrass can be killed out with a bleach. Carbamate herbicides in the soil to get rid of the grass. Bermudagrass is killed with representative and amended for soil quality/condition if the bermudagrass is killed out with a bleach. When this happens, additional steps will be more efficient. A mosaic of grasses that include such as glyphosate (Roundup or Glendur) can be quickly applied for more effective treatments. glyphosate can be used in the fall.
Perennial grasses
- Difficult to control a perennial grass in a perennial grass
- May not be worth the effort
- Creeping bentgrass, nimblewill, windmill, smooth brome
  - 3 apps of Tenacity/year
- Zoysia/bermudagrass
  - 5 apps of Roundup starting after green up and every 2-3 weeks until reseeding in the fall
  - repeat in 5 years

Pylex
- Controls bermudagrass in cool-season grasses when combined with triclopyr, 3 apps 2 3-4 weeks intervals starting in June
- Controls nimblewill in cool-season grasses when combined with triclopyr, 3 apps 2 3-4 weeks intervals starting in June
- Also controls goosegrass

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