Weed and Insect Control

Andy Bailey
Weed Control Strategies

• Herbicides
  – Limited number
  – None control all weeds

• Planning weed control strategies
  – Know weeds in field
    • Scouting
  – Weed management components:
    • Herbicides
    • Cultivation
    • Crop rotation
    • Early stalk, root, and weed destruction at season’s end
    • Grow healthy, competitive tobacco crop
Cultivation

• Deep Cultivation
  – Damages roots
  – Brings up untreated soil
    • Increased weed emergence
  – Misconceptions
    • Brings up moisture during a drought that is beneficial to the plant?
      – Really only makes soil dryer by increasing evaporation at surface
    • Deep & Close: stops premature flowering?
      – Does not stop premature flowering
Cultivator Injury

• Other problems with excessive/late cultivation:
  – Spread of disease
    • Tobacco Mosaic Virus (TMV), etc.
    • Root injury, leaf damage
      – ↑ black shank problems
      – ↓ nutrient uptake
Available Tobacco Herbicides

- Command 3ME (clomazone)
- Devrinol 50DF or 2E (napropamide)
- Prowl 3.3EC or H₂O (pendimethalin)
- Spartan 4F (sulfentrazone)
- Tillam 6E (pebulate)
- Poast 1.5E (sethoxydim)
Command 3ME

• Rate: 2 to 2.67 pt/A
• Application timing:
  – Soil surface-applied prior to transplanting or up to 7 days after transplanting
• Weeds controlled:
  – crabgrass, fall panicum, foxtails, jimsonweed, lambsquarters, common ragweed, velvetleaf.
  – Weaknesses: pigweed, johnsongrass

Mild injury in cool, wet conditions
Reducing cover crop damage

- Pre or post surface application
- Work ground prior to sewing cover crop
  - Deep disking
  - Chisel plowing
Spartan 4F

- **Rate:** 8 to 12 fl. oz./A
  - 8 to 10 fl oz/A for most west Kentucky / Tennessee soils

- **Application timing:** PreTransplant
  - From 14 d to 12 h prior to transplanting
  - Soil surface applied, no incorporation.

- **Weeds controlled:**
  - Nightshade sp., morningglory sp., nutsedge sp., pigweed sp., smartweed sp., jimsonweed, lambsquarters
  - Apply 10 oz/A rate if heavy morningglory and/or nutsedge pressure anticipated.
Weed Spectrum – Good Control

• Most Broadleaf Weeds Including
  – Morningglories
  – Yellow Nutsedge

Poor on Common Ragweed
Spartan Splash Injury
Spartan Root Uptake Injury
Spartan Contaminated Sprayer

Burley

Dark
Prowl 3.3EC or H₂O

• Rate: 3 to 3.6 pt/A (3.3EC), 3 pt/A H₂O
• Application timing: PreTransplant incorporated
• Weed controlled: annual grasses and small-seeded broadleaf weeds
  – Grasses: crabgrass, fall panicum, foxtails
  – Broadleaf weeds: lambsquarters, pigweeds.
Prowl 3.3EC

- Temporary injury when under stress
  - Stunting in cold, wet or hot, dry conditions
Devrinol 50DF or 2E

• Rate: 2 lb/A of 50DF, 2 qt/A of 2E
• Application timing: PreTransplant incorporated
  – Incorporate immediately, preferably in same operation
• Annual grass control mainly
• Rotational considerations:
  – 12 mo. for most crops
Poast 1.5E

- 24C special use registration for tobacco
  - Transplanted and in plant beds
- Label is for Poast only, not Poast Plus
- Rate: 1.5 pt/A plus 2 pt/A crop oil
- Application timing:
  - Postemergence to grasses
  - Apply anytime after transplanting up to 42 days before harvest
  - Apply to 6-8” actively growing annual grass
  - Shattercane and johnsongrass: 18 to 25 inches
Poast 1.5E

- Slow acting (2 to 3 wks), non-persistant
- Spot treatment with backpack sprayer:
  - 1% to 1.5% Poast solution plus 1% COC.
  - 1.3 to 2 oz/gal Poast, 1.3 oz/gal COC.

- Cultivation:
  - Do not cultivate within 5 d before or 7 d after Poast application.

- Do not mix Poast with other pesticides
# Herbicide Programs for Dark Tobacco
2006 – MSU, Murray, KY – Mid-Season Plot Rating

<table>
<thead>
<tr>
<th>Treatment</th>
<th>% Crop Injury</th>
<th>Yellow Nutsedge</th>
<th>Common Ragweed</th>
<th>Morningglory Species</th>
<th>Large Crabgrass</th>
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</thead>
<tbody>
<tr>
<td>Spartan 4F</td>
<td>3</td>
<td>91</td>
<td>31</td>
<td>73</td>
<td>70</td>
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<tr>
<td>Command 3ME</td>
<td>0</td>
<td>17</td>
<td>87</td>
<td>53</td>
<td>97</td>
</tr>
<tr>
<td>Spartan + Command</td>
<td>4</td>
<td>96</td>
<td>86</td>
<td>87</td>
<td>95</td>
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<tr>
<td>Prowl 3.3EC</td>
<td>11</td>
<td>23</td>
<td>50</td>
<td>37</td>
<td>89</td>
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<tr>
<td>Prowl fb Spartan</td>
<td>5</td>
<td>93</td>
<td>63</td>
<td>86</td>
<td>97</td>
</tr>
<tr>
<td>Tillam 6E</td>
<td>3</td>
<td>77</td>
<td>64</td>
<td>57</td>
<td>64</td>
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<tr>
<td>Devrinol 50DF</td>
<td>2</td>
<td>22</td>
<td>61</td>
<td>49</td>
<td>75</td>
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<td>Tillam + Devrinol</td>
<td>5</td>
<td>78</td>
<td>72</td>
<td>51</td>
<td>81</td>
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<tr>
<td>Untreated Check</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>LSD(0.05)</td>
<td>4</td>
<td>7</td>
<td>9</td>
<td>21</td>
<td>10</td>
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# Herbicide Programs for Dark Tobacco

**2006 – MSU, Murray, KY – Dark-fired Yield**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Total Yield (lbs/A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spartan</td>
<td>1718</td>
</tr>
<tr>
<td>Command</td>
<td>1745</td>
</tr>
<tr>
<td>Spartan + Command</td>
<td>1855</td>
</tr>
<tr>
<td>Prowl</td>
<td>1677</td>
</tr>
<tr>
<td>Prowl fb Spartan</td>
<td>2028</td>
</tr>
<tr>
<td>Tillam</td>
<td>1658</td>
</tr>
<tr>
<td>Devrinol</td>
<td>1716</td>
</tr>
<tr>
<td>Tillam + Devrinol</td>
<td>1769</td>
</tr>
<tr>
<td>Untreated</td>
<td>1045</td>
</tr>
</tbody>
</table>

**LSD\_0.05** = 131, 182, 461, 546 (total)

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**Yield (lbs/A)**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>LSD_0.05</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spartan</td>
<td>526</td>
</tr>
<tr>
<td>Command</td>
<td>441</td>
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<tr>
<td>Spartan + Command</td>
<td>594</td>
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<tr>
<td>Prowl</td>
<td>491</td>
</tr>
<tr>
<td>Prowl fb Spartan</td>
<td>593</td>
</tr>
<tr>
<td>Tillam</td>
<td>470</td>
</tr>
<tr>
<td>Devrinol</td>
<td>476</td>
</tr>
<tr>
<td>Tillam + Devrinol</td>
<td>591</td>
</tr>
<tr>
<td>Untreated</td>
<td>430</td>
</tr>
</tbody>
</table>

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**Total Yield (lbs/A):**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Total Yield (lbs/A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spartan</td>
<td>2599</td>
</tr>
<tr>
<td>Command</td>
<td>2491</td>
</tr>
<tr>
<td>Spartan + Command</td>
<td>2823</td>
</tr>
<tr>
<td>Prowl</td>
<td>2499</td>
</tr>
<tr>
<td>Prowl fb Spartan</td>
<td>3007</td>
</tr>
<tr>
<td>Tillam</td>
<td>2426</td>
</tr>
<tr>
<td>Devrinol</td>
<td>2549</td>
</tr>
<tr>
<td>Tillam + Devrinol</td>
<td>2715</td>
</tr>
<tr>
<td>Untreated</td>
<td>1723</td>
</tr>
</tbody>
</table>
Diagnosing Chemical Damage in Tobacco

- Look for symptom
  - Stunting
  - Leaf distortion
  - Abnormal vein patterns
  - Discoloration

- Look for possible sources of chemical exposure
  - Drift
    - Other crops near by
    - Rights of way
  - Contaminated Sprayer
  - Contaminated Water Supply
  - Contaminated Fertilizer or Spreader Equipment
Triazines

• Chemicals
  – Atrazine
  – Simazine

• Symptoms
  – Dead tissue begins along leaf margins, then moves to areas between secondary veins
  – Green or yellow tissue adjacent to vein
Triazine Soil Test

- < 0.05 ppm No damage
- 0.05 - 0.20 Injury possible depending on climatic conditions
- > 0.20 Injury expected

Crop Exposure

- Run-off
- Contaminated Sprayer
  - Corn Sprayer
  - Back Siphon
- Contaminated Fertilizer Buggy or Wagon for hauling plants
  - Use of same equipment used for corn
Triazine Injury on Transplants
Contaminated wagon for hauling plants
Growth Regulators

- 2,4-D, etc.
  - Damage only to developing leaves at time of drift
  - Can assess date of exposure
- Banvel (Dicamba)
  - Similar to 2,4-D
    - But damage more persistent
- Tordon (Picloram)
  - Extreme sensitivity in tobacco .3 ppb
  - Water Soluble
  - Persistent in soil
Growth Regulator Injury to Transplants
Tordon (Picloram) Injury to Transplants

- Burley
- Dark
Acetolactate Synthase (ALS) Inhibitors includes Accent, Beacon, Exceed, Lightning, Pursuit

- For Johnsongrass control in corn
- Drifts for a considerable distance
- Yellowning
  - Leaf tip
  - Spots
- Causes restricted vein (stem) growth
  - Lamina puckers
ALS Inhibitor - Symptoms
ALS Inhibitor Symptoms – Dark Tobacco
Glyphosate
(Roundup and others)
Paraquat Injury
Chlorophyll Inhibitors
Callisto
MH injury

Rate too high, hot conditions

MH sprayer contamination on young tobacco
Managing Insects

Andy Bailey
Float Bed Insects
Float Bed Insects
Control

• Gnats, Flies, Aphids, Cutworms, & Armyworms
  – Orthene or Acephate 75 SP
    • 1 tsp/gal

• Slugs
  – Metaldehyde Bait Pellets (Deadline M-Ps)
  – Keep area free of plant debris, boards, paper, etc

• Bloodworms
  – Keep Algae under control
Major Transplant Insect Pests
Aphid & Flea Beetle Control

• **Tray Drench / Transplant Water**
  - Admire 2F
    • 1 oz/1000 plts
  - Admire Pro 4F
    • 0.5 oz/1000 pl Drench
    • 0.6 oz/1000 plants TPW
  - Platinum 2SC
    • 0.8-1.3 oz/1000 plts
  - Belay 16WSG
    • 5-10 oz/A

• **Methods**
  - Tray Drench and Rinse
  - Transplant Water (TPW)
• **Lorsban 4E**
  • 2 qts/A pretransplant inc

• **Transplant Water**
  – **Orthene 97**
    • 3/4 lb per acre
  – **Acephate, Bracket, Orthene 75S**
    • 1 lb per acre

• **Transplant Water**
  – **Admire Pro**
    • 0.8 to 1.2 fl oz / 1,000 pl
  – **Platinum 2 SC**
    • 1.3 fl oz / 1,000 plants
Major Foliar Insect Pests
CONTROLLING APHIDS

Green Peach Aphids
Red Aphids

Threshold in tobacco:
3 wks after TP to topping
≥50 aphids on at least 1 upper leaf of 20% of plants

Aphid Colonies

June
July
August
Sept

Untreated
Treated
Pretreated
Budworms

• Threshold
  – 5 or more per 50 plants
  – 3 weeks after transplanting until 1 week before harvest
Hornworms

• Threshold
  – 5 or more hornworms per 50 plants
  – 3 weeks after trans planting until harvest
  – Do not count if white cocoons.
<table>
<thead>
<tr>
<th>Budworm and Hornworm Insecticides</th>
<th>Rate/Acre</th>
<th>Harvest Interval (Days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acephate 75 SP, Orthene 75 SP, Orthene 97</td>
<td>2/3 lb (HW) to 1 lb (BW), 2/3 lb (HW) to 1 lb (BW)</td>
<td>3</td>
</tr>
<tr>
<td>*Agree WG</td>
<td>1 to 2 lbs</td>
<td>0</td>
</tr>
<tr>
<td>*Biobit HP or F</td>
<td>½ lb HW 3/4 lb BW</td>
<td>0</td>
</tr>
<tr>
<td>Denim 0.16 EC</td>
<td>8 to 12 fl oz</td>
<td>14</td>
</tr>
<tr>
<td>*Dipel 10 G</td>
<td>5 to 10 lbs</td>
<td>0</td>
</tr>
<tr>
<td>*Dipel DF, *Dipel ES</td>
<td>1/2 to 1 lb, 1 to 2 pts (BW), ½ to 1 pt (HW)</td>
<td>0</td>
</tr>
<tr>
<td>Endosulfan 3E</td>
<td>2/3 to 1-1/3 qt</td>
<td>5</td>
</tr>
<tr>
<td>*Javelin WG</td>
<td>1/8 to 1-1/4 lb</td>
<td>0</td>
</tr>
<tr>
<td>Lannate SP</td>
<td>½ lb</td>
<td>14</td>
</tr>
<tr>
<td>*Lepinox WDG</td>
<td>1 to 2 lbs</td>
<td>0</td>
</tr>
<tr>
<td>Sevin 80S</td>
<td>1-1/4 lbs</td>
<td>0</td>
</tr>
<tr>
<td>Tracer 4SC</td>
<td>1.4 to 2.9 fl oz</td>
<td>3</td>
</tr>
<tr>
<td>Warrior 1 CS</td>
<td>1.9 to 3.8 fl oz</td>
<td>40</td>
</tr>
<tr>
<td>*XenTari DF</td>
<td>½ to 2 lb</td>
<td>0</td>
</tr>
</tbody>
</table>
Flea Beetle

Control

- Acephate & Orthene 75 SP
  - 2/3 lb - 1 lb
- Orthene 97
  - ½ lb
- Actara 25% WDG
  - 2 to 3 oz
- Endosulfan 3E 2/3 qt 1-1/3 qt
- Lannate 90 SP
  - ½ lb ½ lb
- Provado 1.6 F
  - 4 fl oz
- Sevin 80S
  - 1-1/4 lb to 2-1/2 lb
- Carbaryl 4L
  - 1 qt to 2 qt
- Warrior 1 CS
  - 1.92 to 3.84 fl oz
Grasshoppers

Control

- **Acephate & Orthene 75 SP**
  - 1/3 lb 2/3 lb

- **Orthene 97**
  - 1/4 lb ½ lb

- **Endosulfan 3E**
  - 2/3 qt 1-1/3 qt

- **Lannate 90 SP**
  - ½ lb ½ lb 14

- **Warrior 1 CS**
  - 1.92 to 3.84 fl oz
Pesticide Concerns

• Illegal pesticides
  – Could void contract

• Indiscriminant use of labeled pesticides
  – Endosulfan (Golden Leaf)
  – MH

Do not use at or after topping