GRAIN SORGHUM WEED CONTROL: START CLEAN, STAY CLEAN

Sarah Lancaster
Assistant Professor and Extension Specialist
Some key weed species
To what extent have limitations in weed management led you to avoid growing grain sorghum?

- A lot
- Somewhat/occasionally 100%
- Not at all
Back to the basics

• Use integrated practices

• Make timely applications
Potential carryover

- Accent
- Python
- Varro
- Classic
- FirstRate
- Pursuit
- Reflex
- Raptor
- Scepter

Rainfall data from KS Mesonet
Start clean

- Burndown or tillage
- Atrazine
- Group 15
- Group 27 + atrazine

![Bar chart showing Palmer amaranth and Large crabgrass growth suppression with S-metolachlor + atrazine and S-metolachlor + mesotrione + atrazine]
## Herbicide Application

<table>
<thead>
<tr>
<th>Herbicide</th>
<th>SOA group</th>
<th>SOA group</th>
<th>Activation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atrazine</td>
<td>Aatrex 4L</td>
<td>5</td>
<td>NA</td>
</tr>
<tr>
<td>Acetochlor</td>
<td>Harness</td>
<td>15</td>
<td>1/4-3/4”</td>
</tr>
<tr>
<td>S-metolachlor</td>
<td>Dual II Magnum</td>
<td>15</td>
<td>1/2-1”</td>
</tr>
<tr>
<td>Dimethenamid-P</td>
<td>Outlook</td>
<td>15</td>
<td>NA</td>
</tr>
<tr>
<td>Mesotrione</td>
<td>Callisto</td>
<td>27</td>
<td>1/4”</td>
</tr>
</tbody>
</table>
### Stay clean

<table>
<thead>
<tr>
<th>Active ingredient</th>
<th>Trade name</th>
<th>Sorghum Timing</th>
<th>Palmer timing</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,4-D</td>
<td>several</td>
<td>5-15”</td>
<td>“small”</td>
<td>later application with drop nozzles, injury</td>
</tr>
<tr>
<td>Atrazine</td>
<td>several</td>
<td>&lt;12”</td>
<td>1.5”</td>
<td>&gt; 6” in western KS</td>
</tr>
<tr>
<td>Bromoxynil</td>
<td>several</td>
<td>3 if – boot</td>
<td>2”</td>
<td></td>
</tr>
<tr>
<td>Dicamba</td>
<td>several</td>
<td>V3 – 12”</td>
<td>3”</td>
<td></td>
</tr>
<tr>
<td>Fluroxypyr</td>
<td>Starane Ultra, others</td>
<td>3 if – 7 if</td>
<td>NA</td>
<td>later application with drop nozzles</td>
</tr>
<tr>
<td>Quinclorac</td>
<td>Facet, others</td>
<td>12”</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Fluroxypyr + bromoxynil</td>
<td>Starane NXT, others</td>
<td>V4 – V7/8</td>
<td>NA</td>
<td>later application with drop nozzles</td>
</tr>
<tr>
<td>Pyrasulfotole + bromoxynil</td>
<td>Huskie</td>
<td>3 if – 30”</td>
<td>4”</td>
<td></td>
</tr>
<tr>
<td>Acetochlor</td>
<td>Warrant</td>
<td>11”</td>
<td>NA</td>
<td>safened seed</td>
</tr>
<tr>
<td>Dimethenamid –P</td>
<td>Outlook</td>
<td>12”</td>
<td>NA</td>
<td>safened seed</td>
</tr>
<tr>
<td>S-Metolachlor</td>
<td>Several</td>
<td>75 d PHI</td>
<td>NA</td>
<td>safened seed</td>
</tr>
</tbody>
</table>
What herbicides are you planning for your grain sorghum acres in 2021?
Herbicide-resistant grain sorghum

- **Inzen**
  - Corteva
  - Zest herbicide (nicosulfuron)
    - POST
  - Some varieties available in 2021

- **iGrowth**

- **ADVANTA/UPL**
  - Imiflex herbicide (imazamox)
    - PRE or POST
    - Launch in 2021

- **Double Team**
  - Sorghum Partners/ADAMA

- **First Act herbicide (quizalofop)**
  - Pilot launch in 2021
  - Waiting for Canadian export approval
2020 Trials

- Fallow fields
- PRE:
  - Imazamox (Imiflex) vs Group 15 herbicides
- POST:
  - Imazamox (Imiflex), nicosulfuron (Zest) and quizalofop
  - 2 rates
  - 2 growth stages
Green foxtail control
PRE - Hays

Vipan Kumar, Brent Bean
Large crabgrass control
PRE – Garden City

% Control

<table>
<thead>
<tr>
<th>Product</th>
<th>29 DAT</th>
<th>58 DAT</th>
<th>78 DAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imiflex 6 oz</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Imiflex 9 oz</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Dual 24 oz</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Warrant 64 oz</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Outlook 18 oz</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Pat Geier, Randall Currie, Brent Bean
Garden City –28 DAT

Nontreated

Imiflex 6 oz

Warrant 64 oz

Pat Geier, Randall Currie, Brent Bean
Green foxtail control
EPOST - Hays

% Control

0 25 50 75 100

ImiFlex 6 oz Quizalofop 6 oz Zest 0.68oz

28 DAT
42 DAT

Vipan Kumar, Brent Bean
Hays –28 DAT

Imiflex 9 oz  Quizalofop 10 oz  Zest 1.02 oz

Vipan Kumar, Brent Bean
Large crabgrass control
EPOST – Garden City

% Control

<table>
<thead>
<tr>
<th></th>
<th>14 DAT</th>
<th>28 DAT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imiflex 6 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quizalofop 6 oz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zest 0.68 oz</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pat Geier, Randall Currie, Brent Bean
Green foxtail control
LPOST - Hays

Vipan Kumar, Brent Bean
Large crabgrass control
LPOST – Garden City

Pat Geier, Randall Currie, Brent Bean
## Rotational Restrictions

<table>
<thead>
<tr>
<th>Product</th>
<th>Corn (Field)</th>
<th>Soybeans</th>
<th>Wheat (winter)</th>
<th>Cotton</th>
<th>Canola</th>
<th>Sorghum</th>
<th>Sunflower</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zest</td>
<td>--</td>
<td>15 d</td>
<td>4 mos</td>
<td>10 mos</td>
<td>10-18 mos</td>
<td>18 mos</td>
<td>10-18 mos</td>
</tr>
<tr>
<td>IMIFLEX</td>
<td>8.5 mos*</td>
<td>--</td>
<td>3 mos*</td>
<td>9 mos</td>
<td>18-26 mos*</td>
<td>18 mos</td>
<td>9 mos*</td>
</tr>
<tr>
<td>Quizalofop</td>
<td>120 d**</td>
<td>--</td>
<td>120 d</td>
<td>--</td>
<td>--</td>
<td>120 d</td>
<td>--</td>
</tr>
</tbody>
</table>

*Except Clearfield hybrids/varieties
**Except Enlist hybrids
Stewardship

• Manage to slow the development of herbicide resistant weeds
  • One (IMIFLEX) or two (Zest) applications per year
  • Do not plant sorghum in the same field two consecutive years
  • Do not plant where ALS-resistant shattercane or johnsongrass occur

• Avoid outcrossing to shattercane and johnsongrass
  • Control escapes and grass along field edges
    • Ensure shattercane and johnsongrass are not flowering same time as sorghum
ALS-resistance in shattercane (L) and johnsongrass (R)

Werle et al., 2016
Which of the herbicide-resistant grain sorghum traits is of most interest to you?

DoubleTeam
igrowth
Inzen
None - conventional is fine
None - I don't grow grain sorghum
Atrazine registration review

- Interim decision released Sept 2020
- Two more assessments
  - Endangered species assessment (deadline 9/28/21)
  - Endocrine disruptor screening
- Changes most likely to affect Kansas farmers
  - 15 MPH weed speed restriction
  - 5-foot buffer from edge of streams/rivers and endangered species habitat
  - Medium-sized droplets or larger
WAR AGAINST WEEDS
SILVER BULLETS ARE FOR WEREWOLVES
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K-State Weed Science