Introduction

"Integrated Weed Management: Fine Tuning the System" (E-3065) is the follow up bulletin to "Integrated Weed Management: One Year’s Seeding..." (E-2931) which was released in February 2005. Feedback from an extensive grower survey of "One Year’s Seeding..." determined that there were many questions remaining regarding weed management in sustainable farming systems. "Fine Tuning the System" was written to further address specific areas of interest in weed management.

Similar to "One Year’s Seeding..." this guide does not provide detailed management plans. Each chapter looks at how different cultural management practices affect weeds. Our goal was to include written information from researchers and extension personnel and input from experienced growers.

Chapter 1: Diverse Crop Rotations

Strategies for optimizing rotation effects on weed suppression:

• Alternate early and late season vegetables/field crops
• Use weed suppressive cover crops
• Use "cleaning crops" (e.g. potato) where weeds can be easily managed prior to planting crops in which it is difficult to control weeds (e.g. carrot)

This chapter features diverse four to nine year rotations from field crop and vegetable farms around the North Central Region.

Chapter 2: Cover Crop Systems

Benefits of Cover Crops:

• Cover crops reduce light reaching the soil surface
• Some cover crops release chemicals known to inhibit the germination and growth of small weed seedlings
• Some cover crops act as "biofumigants"
• Cover crops improve soil quality and crop growth
• Cover crops can act as nitrogen scavengers or producers

Several monoculture and polyculture cover crop ideas for weed management are discussed in addition to seeding rates and dates, control options, innovative practices and rotation issues.

Chapter 3: Manure and Compost

Table 1. Sensitivity of weeds to flaming.

<table>
<thead>
<tr>
<th>Weed Type</th>
<th>Sensitive to flaming</th>
<th>Moderate</th>
<th>Tolerant to flaming</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common lambsquarters</td>
<td>common purslane</td>
<td>annual bluegrass</td>
<td></td>
</tr>
<tr>
<td>Common chickweed</td>
<td>legumetum</td>
<td>foral species</td>
<td></td>
</tr>
<tr>
<td>Pigweed species</td>
<td>common groundsel</td>
<td>crabgrass</td>
<td></td>
</tr>
<tr>
<td>Vovitalsof</td>
<td>common ragweed</td>
<td>pineapple weed</td>
<td></td>
</tr>
<tr>
<td>Muscari</td>
<td></td>
<td>muscari</td>
<td></td>
</tr>
</tbody>
</table>

Sources: Ascand 1995, on-farm trials (unpublished data), Gene Vogel

Chapter 4: Flaming for Weed Management

Table 1. Characteristics of weeds that influence susceptibility to grazing pressure.

<table>
<thead>
<tr>
<th>Weed Type</th>
<th>More likely to survive</th>
<th>Less likely to survive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stolon growth</td>
<td>Smallstipe growth</td>
<td>Growth from stem and root surface</td>
</tr>
<tr>
<td>Growing points</td>
<td>Growing points near or below root surface</td>
<td></td>
</tr>
<tr>
<td>Secondary flowering</td>
<td>Secondary flowering on or near the soil surface</td>
<td></td>
</tr>
<tr>
<td>Presence of spines</td>
<td>Presence of spines or thorns</td>
<td></td>
</tr>
<tr>
<td>High nutritional</td>
<td>High in secondary metabolites</td>
<td></td>
</tr>
<tr>
<td>Value</td>
<td>End on secondary digestion</td>
<td></td>
</tr>
</tbody>
</table>

Chapter 5: Grazing and Other Biological Controls

Table 6: Thresholds: How Many Weeds are Too Many?

Chapter 7: On-farm Weed Management Trials Across the North Central Region

Ten grower-designed on-farm weed management trials were conducted across the North Central Region in 2006 and 2007.

• Effect of corn planting time on weeds (Good Hope, IL)
• Intercropping for weed control in corn (Alma, MI)
• Intercropping buckwheat and oats in corn (North Branch, MI)
• Cover crops for Canada thistle suppression (Maple Park, IL)
• Mulches for common purslane control in tomato (Urbania, IL)
• Ridge-till vs. conventional-till in soybean (Harlan, IA)
• Cultivator comparisons for weed control (Schoolcraft, MI)
• Flaming and rotary hoeing in corn (Creston, IA)
• Flaming and rotary hoeing in soybean (Alma, MI)
• Organic herbicide for soybean weed control (West Bend, WI)

Appendix: The 2nd Dirty Dozen (+ 2)

Knowing your enemy is the key to weed management. With that in mind, fourteen of the North Central Region’s worst weeds have been profiled in “Fine Tuning the System” to complement the original 12 profiled in “One Year’s Seeding...” Profiles cover known lifecycle and management information. Weeds discussed include Canada thistle, common pokeweed, curly dock, fall panicum, henbit, horsenettle, jimsonweed, perennial sowthistle, purple deadnettle, quackgrass, white campion, wild carrot, wild mustard and yellow nutsedge.

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