

# ORGANIC WEED CONTROL!

**WEEDS HAPPEN.** Weeds are a fact of life for organic farmers, and even after over 20 years of growing organic row crops and small grains on our Penn Yan farm, weed control is our biggest challenge each year. We have learned *many* things over the years, but the most important is this: it is very possible for organic weed control to be fully equal to chemically-induced weed control, as long as we remember that : *It is **ALWAYS** the 3-way combination of (1) specific soil/crop conditions, (2) careful observation/timing, and (3) choosing/setting the machinery correctly that determines success . . . or not.*

An effective weed control program integrally involves every aspect of organic crop production. As many farmers begin to explore organic possibilities, invariably the first two questions are “what materials do I buy for soil fertility?” and “what machinery do I buy to control weeds?” We too asked these questions at the beginning, but quickly realized that for both our weed control and our soil fertility programs to be successful, we had to integrate all of the following – soil health & drainage, mineral nutrient levels, prevalent weed species, weather, crop rotations, field histories, crop varieties, markets and specific market quality demands, and our available time and labor, along with our equipment and repair/upgrade needs. Although we farm 1600 organic acres with large equipment, these factors are really size-independent, from the smallest vegetable farm to the largest organic grain farm, with pastures and hayfields definitely included!

## CULTURAL WEED CONTROL

Do you think that cultivation is the only way to control weeds? Do you think weeds are just random events? Think again! There are many things you can do to change field conditions, favor crop growth and competition, change prevalent weed species to ones easier to control, and reduce overall weed pressure. Cultural weed control - that is, changing the conditions that promote weed growth - is a multi-year, whole-farm approach:

**1. Know your Enemy** - learn how to identify your troublesome perennial and annual weed species, study their life cycles and growth patterns, and learn their weaknesses and vulnerabilities. For example – Canada thistle is a tough, invasive perennial weed, but it is very vulnerable to mowing right before bloom. Targeting thistle-infested areas by mowing at bloom will often bring it under control. Putting a thistle-infested field into hay or annual forage for a couple years, and mowing at the most vulnerable times, can often control a serious patch of thistle.

**2. Crop Competition** – without a doubt, THE most effective way to control weed growth is to have highly vigorous crops. It is important to use high quality vigorous seed, well-adapted varieties, optimal soil fertility, good drainage and tilth, proper soil preparation etc to produce the most competitive crop possible. The faster your crop grows taller than the weeds and shades the ground surface, the less competitive weeds will be. A healthy vigorous crop that emerges quickly and uniformly and then grows rapidly is certainly a weed’s worst enemy, and a farmer’s best ally!

**3. Soil Fertility and Condition** – In an organic system, an active, diverse microbial population is the

primary source of soil fertility, tilth and resilience. Soil organic matter, obtained through cover crops, plant residue, manure, and compost, provides essential food for the microbes and soil water holding capacity. Soil tests can be useful, but only if the results are interpreted carefully for an organic system. The balance of key nutrients can often change weed problems by changing soil physical and chemical conditions, although the more we see, the more we suspect the weed species present are largely determined by the microbes favored by the certain soil conditions! Some weed species are favored by low fertility (bedstraw), while others are favored by high fertility (galinsoga, lambs quarters) Some weed species are favored by hard crusty soils sspring-planted crops with fall-planted crops, heavy feeders with light feeders, row crops with close-planted crops. Careful use of cover crops during times when the ground would be bare will add nutrients and organic matter, suppress weeds, increase microbial diversity, and prevent erosion. A diverse crop rotation will prevent well-adapted weed populations from developing.

**5. Allelopathy** – some plant species compete with each other by releasing chemicals from their roots. We can incorporate these crops in rotations to target weed problems. Common alleopathic crops include rye, barley, buckwheat, alfalfa, barley, oats, and red clover. Short-term cover-cropping with buckwheat or mustard can suppress specific weed and insect problems.

**6. Sanitation** – it is always best to prevent weed problems. Using clean seed, mowing weeds around the edges of fields, hand-roguing weeds in problem

areas, cleaning machinery and thoroughly composting manure are some ways to prevent weed seeds from building up in the field.

## **MECHANICAL WEED CONTROL**

It is important to divide mechanical weed control into 4 main phases – (1) tillage, (2) planting, (3) early season 'blind' cultivation, and (4) between-row cultivation. Each stage is absolutely critical to achieving weed control.

**1. Tillage** – appropriate pre-plant soil tillage (1) creates a good seed bed for vigorous uniform crop emergence, (2) prepares the ground for successful subsequent mechanical weed control, and (3) can eliminate much of the weed potential. If initial tillage is done 7-10 days before planting, one large flush of germinating weeds can be killed during final field preparation. If tillage can be done on a hot sunny day, this will dessicate perennial weed roots. However, if tillage is done when the soil is wet, this can create compacted and cloddy soil which will make subsequent weed control much more difficult.

**2. Planting** – more crop is lost, and more weed problems created, by a poorly adjusted or worn planter than most farmers realize. Repair/replace worn and warped planter parts before the beginning of the season. Test the planter early. Get off the tractor regularly and dig up some seeds to check accuracy, uniformity and depth. Make adjustments as needed. Avoid planting in wet or lumpy soil.

**3. Early Season Blind Cultivation** – this involves shallowly tilling the entire field shortly after

planting to stir the top 1-2 inches, adding air and causing the millions of tiny germinating weeds to dry out and die. The larger crop seeds are planted below this level and will not be damaged. There are several tools that are used for blind cultivation – coil tine harrows, rotary hoes, Lely finger weeders and Einbock tine harrows are most common. Different style teeth stir the soil in different ways, so you may need to study the available tools to choose the style best for your soil, crop plants and conditions.

**4. Between-row cultivation** – when the crop rows are clearly visible, usually when corn plants are 8-10 inches or soybeans are in the third trifoliolate stage, it is time for between-row cultivation. There are rear, belly and front mounted cultivators, and many types of cultivator teeth, shanks and points. Each work somewhat differently. Some farmers favor tractors with only rear-mounted cultivators, while others prefer a combination of 2 or more units.

Additionally during cultivation, farmers need to make constant in-field adjustments of (1) tractor speed (2) horizontal and lateral adjustment of the shovels (3) depth of shovels (4) down pressure on the gangs (5) distance of shovels from the row. These factors may change across the field or in the course of a morning, as soil, crop and weed conditions change. Watch all the rows carefully, and be aware when conditions change.

For more information on cultural and mechanical organic weed control under Northeast conditions, please see several articles at [http://www.lakevieworganicgrain.com/pub\\_art1/pub\\_art\\_index.html](http://www.lakevieworganicgrain.com/pub_art1/pub_art_index.html)

