Weed Biology

George W. Hamilton
Extension Educator, Agricultural Resources
UNH Cooperative Extension - Hillsborough County
468 Route 13 South
Milford, NH 03055

Weeds are plants growing in a place where they are not wanted! Weeds affect the profitability of a farm by:

- Reduced Yields
- Reduced Crop Quality
- Increased Production Costs
- Increased Labor and Equipment Costs
- Insect and Disease Carrier or Hosts
- Poisonous or Irritating to People

Weed management in vegetables is difficult regardless of the strategies used by growers. To obtain good control of weeds, growers must be aware of a variety of information and management tools which are available. This presentation will highlight a basic understanding of weed biology dealing with weed management.

Weed Classification by Botanical Description

Weeds are classified in several ways and one of the most basic is a separation into botanical description of monocots and dicots.

Monocots include all grasses as well as sedges. Although sedges, most notably nutsedge, are sometimes called grasses, they are not the same and will not be controlled by herbicides specific for grasses. Both of these types are identified by a single shoot or spike which emerges first from a germinating seed or a tuber.

All other weeds are called broadleaf weeds or dicots. These are identified by a set of cotyledons or "seed leaves" which first emerge from a germinating seed. Broadleaf weeds can divided into two groups: herbaceous dicots and woody dicots.

Herbaceous Dicots

- Generally broad, net-veined leaves
- Root system coarse or taproot
- Seedlings contain two seed leaves
- Plants do not develop persistent woody tissue

Woody Dicots

- Root system coarse or taproot
- Seedlings contain two seed leaves
- Plants have woody tissue

Weed Classification by Life Cycle

Weeds can be discussed according to the weed's life cycles. The life cycle follows the weed's development through the following stages: seed germination, plant growth, flowers, seed matures, and plant dies. All weeds fall into one of 4 life cycle categories. These include summer annuals, winter annuals, biennials, and perennials.

Summer annuals are weeds that complete their life cycle in 1 year or less. The summer annual's life cycle starts in the spring and ends in the fall. These weeds are triggered to germinate as the soil warms in the spring with most broadleaf weeds germinating before grass weeds. In the fall, these weeds will produce viable seeds which will overwinter and germinate the following spring. Most weeds common to vegetable planting fall into this category. Examples of important summer annual broadleaf weeds include carpetweed, galinsoga, jimsonweed, common lambsquarters, black nightshade, common purslane, common ragweed, redroot pigweed, Pennsylvania smartweed, and velvetleaf. Examples of important summer annual grasses include barnyardgrass, crabgrass, fall panicum, and foxtails (yellow, green, and giant).

Winter annuals are weeds that also complete their life cycle in one year or less. In this case, however, the cycle is from fall to spring. These seeds usually germinate as the soil cools. The weeds grow vegetatively during the fall, overwinter, and then produce viable seeds before the weather becomes hot the following spring and summer. Many weeds common to small fruit plantings fall into this category. Most are winter annual broadleaf weeds. Important examples include common chickweed, wild mustards, henbit, and field pansy.

Biennials are broadleaf weeds which complete their life cycle in two years and are sometimes confused with winter annuals. They germinate and form a low rosette of leaves the first year and form an upright seed stalk during the second year. They are not usually a problem in annual cropping systems since they need such a long time to produce viable seeds although they can be a problem in small fruit plantings. Examples include common burdock and wild carrot.

Perennials are weeds that live for 3 or more years. There are two types, simple and spreading. Simple perennials grow as individual broadleaf plants with a taproot and reproduce by producing viable seeds. The most common example of a simple perennial is dandelion. Spreading perennials usually do not produce viable seeds but spread vegetatively. There are grasses, sedges, and broadleaf perennial weeds. Important examples of spreading perennials include quackgrass (sometimes called witchgrass), yellow nutsedge, and field bindweed. Usually, no part of these weeds are exposed during the winter and they must grow each year to remain alive over several years.

In summary, developing any "Weed Control Strategy" is dependent on both the botany of the plant (Moncot or Dicot) and the life cycle of the plant (Annuals, Biennials or Perennials).