Weeds Control

Perennial-weed infested raspberry planting

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Poor weed control is a major factor limiting profitability of berry crops. Solutions exist, but they must be implemented with knowledge and skill. The main goal of weed management is to optimize yield by minimizing weed competition for water, nutrients and sunlight, and preventing seed production. Weeds also interfere with harvest, and increase the incidence of crop disease by maintaining high levels of humidity within the crop canopy and serving as hosts for plant pathogens. The first step of an effective program is to identify weeds. **Understanding the characteristics and growth habits of weeds (i.e. biology) can help you formulate an effective weed control program.** For example, weed stage of growth is one factor that can have a large influence on the effectiveness of control, but the 'right stage' varies among species. Similarly, longevity of seeds in the soil varies among species as do the conditions that stimulate germination and emergence.

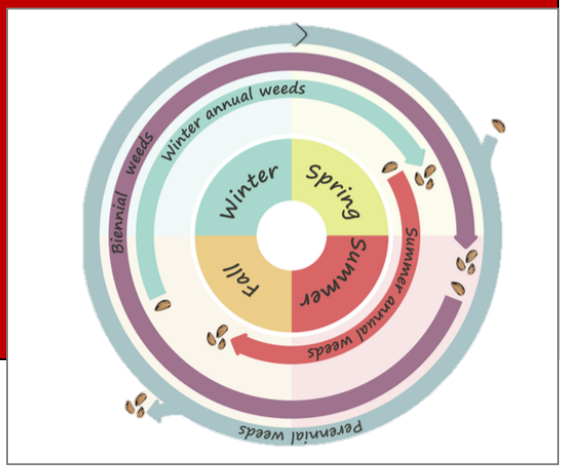
> "A weed is a plant that grows where it is not required and that interferes with the growth of a cultivated plant".

Lessons from Weed Biology

All weeds fall into one of the three life-cycle categories…

Annuals: species that complete their life cycle (seed to seed) within one growing season or one calendar year. Horseweed and common groundsel are examples. Annuals are best controlled at the seedling stage. Preventing seed production for

Life cycle of annual, biannual and perennial weeds



a few years will reduce occurrence.

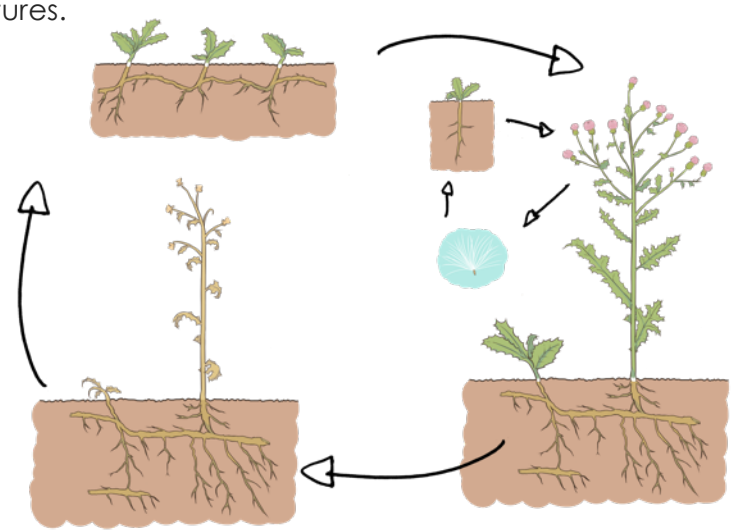
Biennials: species that complete their life cycle over two growing seasons such as common burdock and wild carrot. Biennials may establish at any time of the year and are easiest to control as seedlings.

Perennials: species that continue to grow from the same root or stem for many seasons. Perennials may establish from seed, and most readily arise from rhizomes, stolons or root pieces. There are two types of perennials: *Simple perennials*, such as dandelion, have a deep tap root. They reproduce mainly by seed and do not spread extensively by the root system unless the root is cut and spread around. *Creeping perennials*, such as Johnsongrass and Canada thistle, are those that spread mainly through rootstocks; i.e. stolons, rhizomes and creeping root systems. Creeping perennials are very difficult to control in berry crops and rootstocks should be eradicated before planting.

Life cycle of creeping perennials: Canada thistle

First year creeping perennials are bested controlled at the seedling stage.

Root systems are best controlled by herbicide at the flowering stage when plants are exporting sugars to the underground structures.



Guidelines for Weed Control

Before Planting. Different management strategies are required for annuals, biennials and perennials. Most perennial weeds generating from roots or rhizomes cannot be controlled effectively in the spring before planting berries or after the crop is planted.

Growers should focus on eliminating perennials the year before planting.

Management strategies include:

• Optimize soil conditions, by improving soil nutrition, adding organic matter, adjusting soil pH, and improving soil drainage.
• Use tillage to fragment the underground mass of perennial weeds and to stimulate growth of foliage.
• Use appropriate herbicide(s) to kill rhizomes, stolons and creeping roots.
• Identify annual weeds in the field as a guide for future control methods.

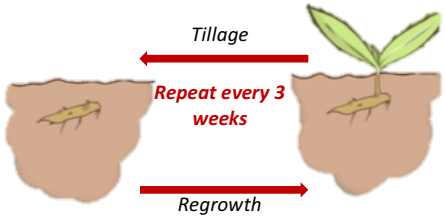
To keep in mind:
- Germinating seeds and seedling plants are easiest to kill.
- Once flowering has occurred many annuals can still produce viable seeds even after being pulled.

Weed Control Methods

Tillage, cultivation, weeding by hand and the careful use of herbicides will result in optimum control for most berry crop growers. Along with good crop cultural practices combined use of these methods is referred to as Integrated Weed Management.

Tillage. Weed control is one of the main benefits of tillage. It 'flushes out' annual weeds and reduces the weed seed population. It brings seeds to the soil surface where light, oxygen and other factors stimulate seed germination. Repeated tillage can be used to kill germinated weed seedlings and deplete the reserve of weed seeds in the soil. Tillage also exhausts the energy reserves of perennial weeds by first stimulating growth of rootstock-originated shoots and damaging them after they have already used a large portion of stored energy for growth. If tillage is repeated often enough, energy depletion will kill their productive structures.

Canada Thistle control by tillage



Begin tillage 3 to 4 inches deep when the shoots have emerged 4 to 6 inches high in the spring. Continue tillage whenever thistle regrowth occurs. This may require more than a single growing season.

Cultivation. It is performed after the crop has been planted. It controls weeds in the same ways as tillage. Its purposes are to reduce weed competition by killing small weed seedling while not damaging the crop, and to prevent weed seed production. Cultivation should be done when weeds are very small.

Cover crops/ground covers. Cover crops can be used in several ways to improve the overall success of plantation. They can be used to suppress weeds and improve soil quality before planting, and also in alleyways in established plantings. To suppress weed cover crops must grow quickly and cover the soil completely. They suppress weeds by competing for water, light and nutrition. Summer or winter annual cover crops like buckwheat, rye, and wheat are good choices for pre-plant preparation as they form dense canopies and root systems. Perennial grasses are used to suppress growth of weeds between rows of bush berries and to provide a more trafficable surface. Select grasses that do not grow tall, nor spread fast laterally. Fescues are most commonly used in row middles. They should be seeded several months before planting berry crops.

Herbicides. Systemic herbicides are chemical tools to manipulate plant growth and have been described as 'the hoe that translocates', meaning they have the ability to kill perennial rootstocks without direct contact i.e. by moving from treated leaves to the root system. Not all herbicides are systemic; some provide only contact activity, meaning they kill only the foliage they contact. Many herbicides used in berry crops are selective, that is they kill certain weeds while not harming the crop. Some weeds may also not be controlled. Some herbicides that are used pre-emergence have no effect on established weeds but will continue to control germinating weed seedlings for many weeks after application.

Sample of weed control program for perennial-infested field prior to planting