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Weed Control in Home Gardens

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All plants occupy ecological niches and prosper in environments conducive to their growth and reproduction. The gardener is introducing vegetable species not naturally found in the garden site, and in the mind of the gardener, the naturally occurring species are undesirable. These undesirable species, commonly called weeds, are often more suited to growing conditions in the garden site than are the introduced vegetable species. Gardeners should expect to encounter weeds in most any site selected for a garden.

Weeds have hampered food production since our ancestors first began to select and cultivate native plants. Things have changed little in this regard over the centuries. The major problem is in the concept that a garden should always be free of weeds. It is possible to have a weed-free garden, providing you are willing to spend many hours removing weeds by hand. Gardeners should approach weeds as native plants that are an integral part of our total ecosystem. The concept should be management, not total control or eradication. The following strategies will help you manage the weeds you encounter in the garden to successfully grown desired crops.

Planning

Careful thought before planting the garden can help reduce weed problems. Within the garden, the desirable species should be arranged by categories or groups.

The first grouping should be based on planting date. Group the earliest plantings together, then the next planting, and continue this pattern until all species have been planted. This is very important for successful weed management in the garden. Different weed species will germinate at different times during the year and the early-planted vegetables will encounter different weedy species than those planted later in the summer.

Within each planting group, arrange the desired species in the garden by size. Plant the prostrate species next to each other, the shorter species together, and the taller species together.

Grouping vegetables this way will help you manage weeds, particularly later in the growing season. Those vegetables that produce a dense canopy leaves prevent light from reaching the late-emerging weeds growing under the canopy. In this limited light environment, the weed species do not grow as rapidly and are less likely to reduce the quantity and quality of the vegetables.

To till or not to till

Many gardeners assume that to be successful you must till the soil to bury any weeds or crop residue on the

soil surface and to have a smooth seedbed. This smooth seedbed is necessary for very small-seeded vegetables such as spinach, lettuce, carrots, beets and radishes and for most root crops. Larger-seeded species such as lima beans, snap beans and corn and many transplanted species such as tomato, pepper, broccoli and cauliflower can become established and produce an abundant harvest without tillage. Gardeners should take advantage of no-tillage vegetable gardening for several reasons: (1) continuous tillage results in loss of soil organic matter; (2) continuous tillage with power driven tillers often destroys soil structure and increases soil compaction; (3) tillage requires more labor; (4) a mulch of cover crop residue or straw conserves soil water; and (5) this mulch can be a valuable asset in weed management.

Weed management

Successful weed management should integrate cultural practices such as planting density and row spacing with hand weeding, hoeing, mechanical cultivation, mulching and herbicides (for those who wish to use them). The proper use of cultural practices and mulches will reduce hand weeding. Following is a discussion of the various methods that can be used to manage weeds.

Cultural practices – In plant communities of mixed species (vegetables and weeds), the plant that emerges first and begins growing has a powerful advantage over those species that merge later. Keep the vegetables weed-free during the first two- or three-weeks to ensure that vegetables gain a competitive advantage over the merging weeds. One way to accomplish this competitive advantage is to plant the various vegetable species in as narrow rows as possible. The closer the rows are together, the greater the influence they will impose on any weeds that emerge.

Hand weeding – The oldest method of weed control is hand weeding and is still the most effective for commonly occurring weed species in Kentucky. Hand weeding is particularly effective for removing annual weeds. Perhaps the major advantage of hand weeding is that weeds growing in the row can be removed without harming the vegetable crops. It is often much faster to remove a few weeds by hand than attempting to remove them by hoeing or with mechanical cultivation.

Hoeing – Hoeing is most effective for removing small weeds between the rows and in the row of vegetables with a wide spacing between plants. A sharp hoe makes this job much easier. You should drag the hoe along the soil surface or slightly below the surface to kill the weeds. This shallow hoeing is important, es-

pecially when hoeing near the vegetable plants; deep hoeing near the plants will destroy roots of vegetables. Stay ahead of the weeds by hoeing as often as possible. It is often necessary to hoe each week during periods of rapid weed emergence and growth during the spring and early summer.

Mechanical cultivation

Mechanical cultivation is used generally in large gardens. This method is effective in destroying weeds and can be much faster than hoeing or hand weeding. It is effective in removing weeds between the rows. Weeds emerging in the row must be removed by hand or by hoeing. Be careful not to injure the roots of vegetables by tilling too deeply or too close to the vegetables.

Mulches

A variety of mulches are available for weed management in the garden and all of them have advantages and disadvantages. Mulches prevent weed emergence or suppress weed growth in one of two ways: (1) by excluding light; or, (2) by releasing naturally occurring organic chemicals that prevent weed seed germination or inhibit growth. Gardeners should be aware of the various types of mulches and select the one that best fits their need.

Inorganic mulches are made of plastic or other petroleum by-products. Of the inorganic mulches, black plastic is the most widely used. A well-prepared seedbed is covered with black plastic and soil is placed on the edges of the plastic to keep it in place. Once it is secure, holes are punched in the plastic at the desired spacing and seeds or transplants placed in the holes. Weeds are suppressed under the plastic; the only place weeds emerge is in the punched holes with the crop. Remove these weeds by hand before they are 2-inches tall. A few species such as johnsongrass, bermudagrass, and yellow nutsedge may emerge underneath and puncture the plastic. Remove these weeds by hand also. At the end of the growing season, remove the black plastic from the soil and discard.

Organic mulches are two types – dead and living. Many gardeners are familiar with organic mulches such as straw, leaves, grass clippings, compost, tree bark and paper. These mulches are most effective when applied at least 2-inches thick. These mulches can be placed on a weed-free soil surface before or after seeding or transplanting. When placed on the soil before seeding or transplanting, be sure to cover the soil with a uniform mulch cover after you have planted or transplanted.

A disadvantage of putting the mulch down before planting is that during the planting process, some soil may become mixed with the mulch and the soil could be moved near the surface of the mulch. Often the soil will contain weed seed which will germinate and become established in the mulch layer. For this reason it is best to place the mulch on the soil after the planting operation. Make sure that any organic mulch used are free of weed seeds – know the source of your mulch. Straw is a notorious source for introducing weed seed into a garden. The organic mulches decay over time and are a source of organic matter for the garden soil.

Living organic mulches are used less frequently in the

garden, but they can be very beneficial for weed management. In this type of system, a cover crop such as cereal grains, wheat or rye, is planted in the fall and allowed to grow in the fall and winter. These cover crops prevent soil erosion and form a dense canopy, eliminating the emergence or growth of many commonly occurring weed species. The wheat or rye is allowed to grow to its full vegetative height and is then killed by cutting. The resulting residue forms dense, uniform mulch. Another option is to kill the wheat or rye with an herbicide such as glyphosate. These cover crops prevent weed emergence while growing and after they have been killed by releasing chemical compounds into the soil that inhibit weed germination and growth by a process known as allelopathy. The allelochemicals do not harm the growth of the desirable vegetables crops. Species such as snap beans, peas, corn and transplanted species such as pepper, tomato, broccoli, cabbage and cauliflower can be grown successfully in this type of mulched system.

Herbicides

The use of herbicides in a garden is another alternative for weed management; however, there is not a large selection to choose from. The major problem with using herbicides in the garden is that no particular herbicide can be used on all the species typically found in the garden. Herbicides generally are developed to use on a few species, and those that can be used in the garden are ones that are used on other large acreage crops such as soybeans, field- and sweet corn, cotton, or small grains. Gardeners must be cautious when using herbicides in the garden to avoid injuring susceptible species.

Herbicides applied before planting must be mixed or incorporated into the soil before planting. These herbicides kill small weed seedlings before they emerge from the soil. Some herbicides can be applied to the soil surface after planting but before emergence of the desired species. These herbicides also kill small weed seedlings. Herbicides applied to the soil before or after planting will control only annual weed species.

Another group of herbicides is applied after the weeds have emerged from the soil; the desired garden species may or may not have emerged when these herbicides can be used. If you plan on using herbicides in the home garden, go to a local garden center and determine if the herbicides for sale are suitable for your conditions. Herbicides used properly will not be harmful to your garden or you. However, herbicides used improperly will often injure desirable garden crops.

The need for herbicides in the home garden should be minimal if you use the other weed management strategies described above.