

Weed Management in Small Fruit Crops

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For small fruit growers, the challenge of weed management is one of the greatest they will face to successfully grow these crops. Factors such as climate, weed introductions and adaptability, and years of agricultural activity have come together to select for weed species that are aggressive and persistent. Without management, weeds compete with crops for light, nutrients and water, resulting in stressed plants, poor fruit quality and yield. Stressed crops are also more susceptible to disease and insect problems, while excessive weed growth itself creates higher humidity in the foliage enhancing disease spread and inviting unwanted insects.

Weed management principles in perennial small fruit crops are similar, with the exception of strawberries in the annual system. Grapes, brambles, blueberries and matted row strawberries are considered permanent plantings in which weed pressure must be addressed throughout the life of the planting. When compared to annual crops, perennial culture is a greater challenge, as fall, spring and winter weeds need to be managed as well as weeds in the summer growing season. Understanding seasonal weed thresholds, and integrating cultural and chemical management becomes even more important in year-round culture.

Weeds problems are best considered with an overall "management" versus a "control" frame of mind. Rarely is absolute "control" attained, though it is approached in some herbicide applications for brief periods of time. In reality, herbicide weed spectrums and residuals are limited, and weed escapes occur. A management frame of mind not only considers herbicide activity, but also integrates factors such as field history, weed species present and their biology, and the effects of crop culture and environment on weed spectrum, numbers and growth. It also involves an understanding of threshold damage, that is what level of pressure can a crop tolerate before yields go down. Take that a step further to an economic threshold, and one needs to weigh the cost of control as compared to potential losses by weed pressure. Thus killing weeds is only part of the picture, understanding them and their relationship to cropping system decisions becomes a part of good management.

Though understanding such relationships and predicting outcomes is at best complicated, there are a few key points about weed ecology worth taking home:

1. Weeds adapt, compete by special means, and have a built-in genetic strategy: to survive and continue the species.
2. Agriculture often provides niches for weed proliferation through herbicide selection and other culture specific activities. Soil movement by equipment and spreading manure are two good examples of ways weeds are introduced into an area.
3. Weed seed in soils can be viewed as a "bank" in which withdrawals and additions occur. It takes only a few escapes to re-seed cropped areas.
4. Weed escapes occur under many conditions, usually it is build-up of certain species tolerant to herbicides used, or even cultural control methods. Escapes also occur by loss of chemical residual, poor spray patterns and coverage, or other environmental factors affecting chemical efficacy. Photoperiodism or response to day length will cause some weeds to go to seed not long after they emerge.
5. Weeds can be highly competitive at low densities. This makes factors that promote weed growth and size development (light, nutrients, water, space) as important as weed numbers in predicting competition.

6. On the other side of the coin, some weeds, though high in numbers may not be very competitive with crops. Thus different species in the weed spectrum may compete with the crop differently, with season, rooting depths, and plant sizes just a few factors involved in determining competition levels.
7. Weed species can also respond to our control efforts differently. Our past and present actions (or non-action) influence future weed pressure.
8. Thresholds values (what we can put-up with) should reflect not only crop yield loss due to weeds, but other criteria as well: crop quality, ease of harvest, and effects on pests and beneficial organisms.

In small fruit, good weed management begins one to two seasons prior to planting. Awareness of previous crops and herbicides used, if the site has been farmed, is important to prevent residual damage to new plantings, and ample time should be allowed for dissipation. Newer field crop herbicides may have label restrictions for up to 24 months or more before any crop can be re-planted.

Also of great importance is the elimination or reduction of existing perennial weeds. Taking care of these weeds pre-plant greatly reduces future problems; it is difficult to deal with perennial weeds in a perennial crop. Grasses such as quackgrass, johnsongrass and Bermuda grass, and other weeds such as nutsedge, field bindweed, wild brambles, trumpet vine and milkweed are important targets. Some spread by vegetative means (roots, stolons and rhizomes) and all produce seed. By fallowing the area, and using repeated cultivation to encourage growth (stale seedbed), weeds are weakened by reduction of stored foods in roots. When combined with the use of systemic herbicides such as Round-up and 2,4-D to kill underground parts, great inroads can be made toward reduction. Timing of chemical application is important; newly regenerating plants draw from underground storage reserves first to push out growth, and then need time to develop foliage before applied chemicals can move downward. In general, late summer to early fall is a good window for effective chemical translocation to roots.

The use of a stale seedbed also induces weed seeds (both annual and perennial) to germinate, and reductions in the "seed bank" can be significant. Cover crops can be used to build soil prior to planting. They can compete well with weeds, and selective herbicidal control (depending on cover crop and weed species) is possible.

Grapes, brambles and blueberries are planted in rows separated by aisles wide enough for equipment. In contrast to annual row crops, the space between rows can be kept clean cultivated (as in strawberries), or sown in a permanent cover crop or sod that is mowed. Covers should be seeded in the late summer/fall in the year prior to planting. They can also be seeded after planting in the spring. This leaves only the area within the row for weed control.

The basic principles of weed management are similar for small fruit crops. However, because of different cultural requirements, each crop should be considered individually. Chemical recommendations for specific crops can be found in the Virginia Cooperative Extension publication: Horticultural and Forest Crops Pest Management Guide, Pub. # 456-017. Contact your local county extension agent for ordering information.

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