MANAGING WEEDS IN NEWLY PLANTED ORCHARDS AND VINEYARDS

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Controlling unwanted vegetation (weeds) in newly planted orchards and vineyards is important to ensure proper development and maturity. When trees and vines are first planted, competition from undesirable vegetation is high, robbing the crop of vital water and nutrients. Shallow-rooted trees (e.g., citrus) are especially sensitive to early weed competition. Because there are many types of tree and vines grown on wide variety of soil types, weed management decisions vary greatly.

Developing a weed management strategy should begin before the trees or vines are planted. An accurate record of the field's weed history will help to define the approach needed. Avoiding fields with a history of problem perennial weeds (i.e., nutsedge, johnsongrass, bermudagrass, etc.) may be easier if one first knows they are a problem prior to planting. Prior to planting, an application of trifluralin disk incorporated four inches deep within the planted row will provide control of several annual broadleaves and grasses. Escaped weeds can then be controlled with postemergence herbicides while they are small. Where yellow or purple nutsedge is a problem, deep plowing with a moldboard plow (e.g., Kverneland, Wilcox, etc.) can help bury the reproductive tubers deep into the soil profile. Done properly, this preplant option can reduce early nutsedge competition. While preplant options may add costs to the crop up front, it can ensure a more desirable environment that favors early tree and vine growth.

There are three basic methods of managing vegetation in trees and vines: mechanical, cultural and physical, and chemical. Because many of the herbicides labeled for use in California are limited based on soil type and/or age of the crop, a combination of approaches often provides the most cost-effective control. Young trees and vines in California are managed by complete tillage, strip-nontillage, trunk-to-trunk, or with a combination of chemical and mechanical.

In complete tillage systems, fields are typically disked in two directions to destroy 90 to 95% of the vegetation. However, since it is essential to remove weeds growing near the trunk, additional hand hoeing crews are required. Using power mulchers in-row equipped with tripping mechanisms may clean up weeds close to the trunks as well, but will not be 100% effective. Only when soils are dry enough to support heavy equipment and prevent compaction can they be used. Therefore, cultivation is done in the spring to reduce weed growth and to prepare a firm surface wherever frost may present problems. This is typically done several weeks prior to bloom in most deciduous orchards and prior to leafing in grapes. The French plow is an effective tool for managing weeds within staked grape vine rows. Problem weeds, like johnsongrass, nutsedge, and others, can be

brought to the middles where they are dehydrated through disking. Care should be taken when using the equipment to prevent mechanical injury to the trees or vines. In most cases staked crops are needed for this equipment. Because many growers have switched to low-volume irrigation, in-row cultivation is not used.

One of the most common methods of managing weeds in orchards and vineyards is using strip-nontillage or strip-minimum tillage. In the fall or winter during dormancy, preemergence herbicides are applied to a narrow (2-8') strip down the planted row to control weeds not yet emerged. Winter rains are used to incorporate and activate the chemical. Herbicide selection and rate will depend on several factors, primarily: weed species, crop age and, soil type. Understanding the weeds present and correctly identifying them will help one to select the appropriate chemical(s). A postemergence herbicide is usually added if susceptible weeds are present at the time of application. Glyphosate or paraquat are typically added in these cases. Applying herbicides in this manner reduces the total herbicide amount needed by 70% or more, improves management of time, and generally provides a higher return on investments. Middles are then either repeatedly disked or mowed during the growing season. Sod cultures (planted species or resident vegetation) can be maintained in the middles, which can allow for entering the field under wet conditions, especially with light equipment. Where mowers are used, the plants are not allowed to set seed. Because plants are actively growing they do compete for water and nutrients. However, because young trees or vines may have limited root systems, competition may be low as long as the tree planted row is kept clean.

Selecting the proper herbicide is important to increase control and reduce costs and potential injury to the crop. The type of irrigation system used also has an influence on herbicide performance. Under frequent drip irrigation, herbicides like simazine, diuron, napropamide, etc., are broken down rapidly through hydrolysis and microbiological degradation. As a result repeated directed or spot treatments of postemergence herbicides will be needed. Soil type can also influence leachability of the chemical, causing injury to the crop. Less mobile herbicides like oxyfluorfen may be desirable where drip irrigation is used. Herbicide persistence is increased under furrow or basin-flood irrigation, but it is more difficult to apply water to the top of the berms.

Herbicides can be applied trunk-to-trunk during the winter to provide a weed-free soil surface. The advantages of this method are maximum frost protection, labor and equipment savings, improved water and nutrient utilization, and earlier orchard maturity. While the costs at the outset may be higher than other methods, the benefits often outweigh the disadvantages. Citrus, because of their shallow roots and need for sufficient frost protection, are often treated in this manner. Soils high in silt, that may crust, can reduce water infiltration under this regime. Periodic or light cultivations may be needed to reduce the problem. This method has a significant potential for improved orchard management practices.

During the first few years of a new tree or vine crop it is important to protect the plant from injury caused by postemergence herbicides. Treating weeds when they are small and conducive to directed sprays is helpful. Using shielded sprayer under minimal windy conditions is also helpful. Although dormant, new plantings are still susceptible to injury through the young bark. This means applying postemergence herbicides on time, before weeds get large and difficult to spray. Controlling new infestations of perennial weeds (like bermudagrass) is important before their stolons become entangled in the tree or vine, after which control is difficult and potential injury to the crop increased. Spot spraying early repeatedly with postemergence herbicides will ensure the infestation does not spread.

While there are different methods of management tools available to control weeds in tree and vine crops, each should be tailored for the particular crop and soil. Because weeds can offer high levels of competition for essential water and nutrients, it is critical that some form of control be utilized that reduces weed growth, while stimulating healthy tree and vine development.