

Planning for the upcoming weed management season

By Brent Sellers and Steve Futch

Weed control programs in citrus are near 10 percent of the total production expenses and represent a significant cost of any grove operation. Weeds present in the grove compete with trees for nutrients, water, space and light, the effects of which may be even greater when trees are already struggling with canker and/or greening. Weeds also harbor insects and rodents, increase fire hazards and cold damage, impede harvesting, interfere with irrigation systems and intercept soil-applied pesticides. Therefore, weed control programs still need careful consideration when planning an overall program for the grove.

While prevention and mechanical methods are important components of a total weed management program, this article will focus upon chemical control options. Chemical weed control programs often vary from one operation to another, and sometimes within a single grove, with soil type, variety, age of the trees and weed species being the deciding factors. Generally, herbicides are categorized as pre-emergence or post-emergence. Pre-emergence herbicides are those that are applied to a fairly clean soil surface before weeds emerge, and

usually must be incorporated by rainfall or irrigation to be effective. Conversely, post-emergence herbicides are applied directly to the foliage of actively growing weeds.

Regardless of classification, a narrow window of opportunity exists for optimum weed control. Pre-emergence herbicides have the most activity during germination of weed seeds and early seedling growth. Some pre-emergence herbicides have limited

post-emergence activity on small emerged seedlings when a surfactant is included in the spray mixture. Further, pre-emergence herbicides that do not possess post-emergence activity must be tank-mixed with a burndown herbicide if weeds have already emerged at the time of application. For example, indaziflam (Alion) has no post-emergence activity, and an additional post-emergence herbicide is required for controlling weeds that have already emerged. Post-emergence herbicides can be active on weeds of various sizes, but activity is often optimum when weeds are relatively small and thorough coverage of the weed foliage is achieved.

Therefore, successful herbicide programs begin with selection of the appropriate herbicide or herbicide mixtures that will control the weeds that have emerged and those that are emerging from the soil.

HERBICIDE SELECTION CONSIDERATIONS

Many things need to be considered before selecting a herbicide to build a successful weed management program. First, it is important to know what weed species are present (or anticipated) within a particular



Clockwise from top left: paraquat injury on fruit, glyphosate injury on foliage, glyphosate injury on fruit, 2,4-D injury on foliage.

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grove. Growers using glyphosate-only programs realize that not all weeds are equally sensitive to glyphosate and may require an additional tank-mix partner to control all weeds present.

Second, the stage of weed growth is also important. As stated earlier, small, recently emerged weeds can be controlled with some pre-emergence herbicides, but that window of opportunity is rather narrow depending on the stage of the weeds present.

Third, the age of the citrus trees is also an important factor because lower rates of pre-emergence herbicides should be applied to younger rather than older trees to minimize potential injury. Additionally, some herbicides are labeled for non-bearing groves, while others are labeled for both young and established trees.

Other factors that should also be considered include herbicide solubility and leaching potential, label-imposed restrictions based on geographic location of the grove (county restrictions), soil type, precipitation or irrigation scheduling, and any other factors on the herbicide label that may affect efficacy or environmental contamination.

TYPES OF HERBICIDE PROGRAMS

Herbicide programs in groves generally fall into two categories: post-emergence only or a combination

of both pre-emergence and post-emergence. Post-emergence only programs usually entail the use of non-selective herbicides such as glyphosate or paraquat. Glyphosate is usually the product of choice because it will translocate within the targeted weed providing control of the entire plant, whereas paraquat only controls the plant part that the spray contacts. For a post-emergence only program to be successful, a minimum of four or more applications per year are often necessary. Further, over-reliance on glyphosate has resulted in a shift in weed populations to those that are more difficult to manage, such as ragweed parthenium, Spanish needle, pusley and various dayflower species. Therefore, it is common to tank-mix products such as saflufenacil (Treevix) with glyphosate to broaden the weed spectrum controlled. If grass species are the primary target, products containing fluazifop (Fusilade DX) or sethoxydim (Poast/Poast Plus) are effective. However, remember that these two products (fluazifop and sethoxydim) do not provide any broadleaf weed control.

A combination of properly selected pre-emergence and post-emergence herbicides can result in decreased trips through the grove for weed control when properly timed. Since we rarely start with a clean soil surface where pre-emergence herbicides are being applied, a post-emergence herbicide mixed with a pre-emergence herbicide is often used. However, the presence of significant amounts of vegetation can severely impact the level of activity from a pre-emergence herbicide application due to the inability of those products to reach the soil surface to control emerging weeds. Therefore, a burn-down herbicide application may be required approximately one month prior to applying a pre-emergence herbicide. Even though pre-emergence herbicides extend the amount of time before another herbicide application is needed, year-long weed control should not be

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expected for any herbicide under our subtropical climate.

EQUIPMENT CALIBRATION

Growers also need to be sure the application equipment is properly calibrated to ensure proper amounts of herbicides are being applied on a treated acre basis. Herbicide sprayer calibration procedures include determining: 1) ground speed, 2) nozzle selection, 3) pressure adjustment and 4) flow rate measurement. All factors will impact the overall treated acre application rate.

When selecting nozzles for use in the boom, be sure to properly choose and adjust the end nozzle on the boom. The end nozzle will almost always be an off-center (OC) nozzle to allow the spray material to be applied some 1 to 2 feet beyond the end of the boom, and to allow proper overlap when treating from both sides of the tree. The spray distance and the OC nozzle angle will greatly impact the distance the spray will travel or may cause the spray to reach low-hanging limbs or fruit in the tree canopy. If the spray reaches low-hanging limbs, phytotoxicity symptoms may be seen on the contacted foliage or fruit.

Phytotoxicity symptoms have been well documented for the frequently used herbicides. These symptoms can include, but are not limited to yellowing or bleaching of the foliage, spots and/or defoliation, fruit drop, strapped-shaped leaves or leaf distortion.

Developing and implementing a properly designed weed management program that addresses the above concepts will enhance weed management within your citrus groves to maximize weed control and minimize the negative effects of weeds within the tree row. 🍊

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