Weeds in Florida citrus — new challenges and opportunities

By S. H. Futch and M. Singh

Above, young citrus planting with adequate weed control.
At left, double boom herbicide application.

Since the early 1960s, Florida citrus growers have relied on the use of herbicides to control or suppress weed growth under the canopy of mature trees and around young trees. These weed management programs frequently used a combination of herbicides, providing both pre- and postemergence control of a broad spectrum of grasses, broadleaf and vines.

Over the years, many of the product label rates per treated acre have been reduced as compared to the early 1960s or 1970s to address environmental and other issues. With the reduction in herbicide application rates, some weeds are appearing to be more difficult to control today than in the past. These difficult-to-control weeds are a result of not only the lower rates used today, but also because some species have become tolerant to herbicides at current use rates.

PRODUCT SELECTION

To be effective, herbicides must be properly selected for the weeds present or anticipated with time. All herbicide labels provide information related to application rates, weeds controlled, worker re-entry, days to harvest, personal protective equipment required, and any special application requirements that may be necessary. These application limitations or requirements may restrict herbicide use in sites such as sandy soils typical to the 'ridge' or may reduce the total application allowed per year of specific products within a given county or region. Examples of these use restrictions include products containing bromacil on the ridge, lower use rates of diuron in Highlands County, special application equipment and record keeping when Landmaster II (glyphosate + 2,4-D), or restricted use pesticides are used.

USE OF LABELED PRODUCTS

Following all label requirements to assure safe and effective use of the products is essential. Growers should make sure when selecting products that they are labeled for the intended crop. With generic products more often available in today's market, some products are labeled for use, but not all generic products are legal and labeled for use in citrus. Examples of where an active ingredient is labeled, but the actual product may not be labeled may include several types of glyphosate and/or 2,4-D. In the case of Landmaster II, a combination of glyphosate plus 2,4-D, it is labeled for use in citrus but only when applied with specific equipment and conditions. The specific equipment includes a leading edge on the boom, back curtain, recording of wind speed, wind direction, time of application and distance from susceptible crops. However, it would be illegal to take products which are not labeled for citrus use and mix them together and apply to citrus if the label does not specifically list the crop (citrus) on the label.

RECORD KEEPING

Worker protection standards (WPS) require that the EPA registration number of all products used within all agricultural operations where agricultural plants are grown be recorded. These records are to be kept for two years and are subject to audit by various governmental agencies. As you record these numbers, you may also be creating a record of illegal use of pesticides if the product is not labeled for the crop or the site and that could be proof of improper use of pesticides. Thus, only use those products which have a current and valid label for the crop and site where the pesticides are being applied. The proper use of all pesticides will also aid in maintaining that the product will be available for future use.

APPLICATION EQUIPMENT

One of the biggest changes within the citrus weed management program has been the development and improvements in application technology as compared to what has been used during the past 10 or 15 years. Today's well-designed equipment allows applications that minimize the contact of herbicide spray with the tree's foliage by using a boom with an extended leading edge and flexible back curtain. The sophisticated equipment can also apply multiple herbicide products, each being contained in multiple tanks and directly injected into multiple lines controlled by electronic sensors.

Many of these newer systems are computer controlled to assure that the proper application rate is being achieved in the event that equipment speed is changed while in the grove. These new technologies have greatly improved application while mini-mizing the potential for off-site movement of herbicide products or mixtures.

HERBICIDE RESISTANCE

While new products have been developed, reliance on some herbicides that were developed 20-30 years ago continues. With this continued and repeated use of the same product and/or mode of action, the risk of herbicide tolerance is increased with time and application frequency. The tolerance to a specific herbicide is simply the ability of a specific weed to survive treatment with a given herbicide to which the species is normally susceptible. This tolerance may be overcome by higher dosages, in some cases, if allowed by the label.

Herbicide tolerance within many common weed species is becoming increasingly more common within our industry. Due to its frequent and widespread use, glyphosate is of particular concern. Glyphosate tolerance is well documented in numerous crops and is not unexpected in weeds found in citrus groves. Over the years, many growers have expressed concerns that many weed species like pusley (*Richardia scabra* or *R. brasiliensis*), Spanish needle (*Bidens alba*), crowfootgrass (*Dactylocten-ium aegyptium*), tropical dayflower (*Commelina benghalensis*) and guineagrass (*Panicum maximum*) are becoming more difficult to control. Rotating between herbicide classes and modes of action will minimize the potential for development of herbicide resistance within citrus weed management programs.

NEW PRODUCTS

Within the past year, a new formulation of pendimethalin (Prowl H_2O) has received EPA registration for use in bearing citrus. All other formulations are still only labeled for nonbearing trees and cannot be used where a crop will be harvested within 12 months of the last application. Prowl H_2O is labeled for control of grasses and should be mixed with a broadleaf product like diuron or simazine to broaden the spectrum of weeds controlled. Prowl H_2O does not provide postemergence weed control. Thus, it should also be tank mixed with products like glyphosate or Gramoxone to provide control of existing weeds, if present. The use rate for Prowl H_2O is 6.3 to 7 pints of product per treated acre with a maximum of 6.3 quarts per treated acre per year.

In addition to Prowl H_2O, Aim (carfentrazone) is registered for use in bearing citrus. Aim when mixed with glyphosate will provide improved control of some difficult-to-control broadleaf weeds such as tropical dayflower and both Florida and Brazil pusley. The use rate for Aim is 1 to 2 ounces per treated acre when mixed with glyphosate at the appropriate use rates for the weeds present. Aim does not provide improved control of grasses.

New generic formulations of diuron and bromacil are entering the citrus market. Many of these generic products perform similar to existing products and have similar use rates and restrictions. When using generic products, growers should review the current labels of all products with the same active ingredient to make sure the maximum annual rate is not exceeded within a 12-month period.

Weed management in Florida citrus is an essential component of the crop production program and accounts for 20 to 25 percent of the annual production costs. Improved technology and proper herbicide selection have im-proved in recent years to provide better weed control within citrus groves.

The Florida citrus industry is being challenged by and changing due to new pests and diseases at a rapid rate. Citrus growers will continue to rely on numerous herbicides to offer successful and economical control of a broad spectrum of weeds that currently exist in Florida groves.

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