Weed control in nursery operations demands continual grower attention throughout growing and selling cycles. Minimizing labor costs and producing better crops that deliver higher profits require a well-planned and consistently implemented weed management plan. A successful plan must balance proper herbicide technology with appropriate hand weeding.

A balanced program is crucial. Some nursery operations rely solely on manual hand weeding throughout all plant growth stages, but this increases labor costs and risks repeat weed contamination. Did you know manual weeding leaves 20% of weeds, seeds and roots behind, allowing continued weed germination and infestation? Manual weeding has its place, but it’s more limited than most growers think.

The following information will help you assess your weed control options and create a weed control program that makes the most sense for your nursery. Very few options are available for use in enclosed structures; therefore, any products discussed by type, active ingredient or trade name are for open-growing conditions only.

**Your crops’ weedy competitors**

Plant safety is the most important grower concern when evaluating weed control options. Since herbicides are not labeled for use in propagation stock, manual weeding at that growth stage remains an important step in a balanced weed management program. However, once liners are potted and have established roots, you can take advantage of new herbicide chemistries that control weeds and enable healthier, more vigorous plant growth.

Plant species vary as much in herbicide tolerance as they do in color and form. You need to confirm the crop’s plant herbicide tolerance by reading and following herbicide label directions and trialing new products under their own growing conditions. Local extension specialists and herbicide manufacturer representatives also can provide additional product knowledge.
You should assess current weed control strategies by asking these questions:

- Which weed species were numerous throughout production units and nursery areas?
- Is the presence of those weeds due to weaknesses in the current chemical program?
- Was chemical rotation practiced within the operation and throughout the production cycle?
- Were these weed species recently introduced into the nursery or have they been a chronic problem that chemical solutions have not controlled?
- What chemical application options are available following potting? Have blocks of plants been tested in the operation for new product safety so they can be part of the weed control program?
- What weeds are seasonal and what herbicide products provide the most effective control of them?

Answering these questions and comparing responses to your operation’s current weed management program may result in program changes. No one herbicide product fits all blocks of plants all the time. Woody ornamentals, for example, will be more tolerant of broad-spectrum herbicides and, consequently, a greater number of pre-emergence and post-emergence herbicide options are available for weed control. However, only a few herbicides are labeled for use on sensitive herbaceous species, particularly flowering perennials and annuals.

In general, the most economical weed control program relies primarily on effective pre-emergence herbicides that manage weeds prior to seed germination and balance the use of hand weeding and post-emergence herbicides, when appropriate.

**Weed species and seasonal differences**

You need to identify whether your weeds are broadleaf, grassy or sedge, and when they germinate. A combination of broadleaf, grassy and sedge weeds is problematic. Weeds that are more closely related to many of the annual and perennial plants grown in the nursery require close attention to plant tolerance.

By identifying when problem weeds germinate, you can better examine herbicide options and how they are rated by university specialists for performance and plant tolerance. Choose the strongest herbicide with the greatest range of plant tolerance for the first spring or fall application rounds or on newly potted, rooted liners. If one herbicide is strongest on cool-season, winter-germinating weeds, place it first in the chemical program rotation. As weed evaluations move into the warmer spring months, chose the strongest-rated herbicide for broadleaf weeds, including spurge and eclipta, and summer grass-like weeds such as döwweed. A good herbicide rotation will result in cleaner plant containers.

University specialists in the south find growers can potentially apply three to six herbicide rounds per year. They suggest possible herbicide rotations based on seasonal weed targets and the greatest strengths of specific active ingredients. For example, as late fall and early spring favor germination of bittercress, active ingredients of isoxaben or flumioxazin should be favored in the rotation. As spring breaks, species such as American burnweed (fireweed), spurge, dogfennel, willowherb and other broadleaf weeds may best be
controlled with rotations of dimethenamid-p, flumioxazin or formulations containing oxyfluorfen. No one product eliminates galinsoga, common groundsel, eclipta, grasses and sedges all at the same level of control, which is further reason why you should practice product rotations throughout the year.

To make the best use of pest management investments, you should place the strongest herbicides in your rotation when specific, challenging weeds are to germinate. Consult regional bulletins evaluating herbicide products across several weed species.

**Understand formulations and application rates**

Pre-emergence herbicide formulations can be liquid or granular, giving you additional considerations to fit your growing operations and production timing.

In general, granular herbicide formulations provide greater plant tolerance, but you must carefully calibrate applicator tools for each product since they differ in particle size and density, which affects application rates. Understanding proper calibration for each herbicide is critical. Individual product labels explain application requirements.

Liquid herbicide formulations give you quicker application over more plant blocks in the nursery than granular products. However, you need to consider plant size, canopy and sensitivity before using them. Always read and follow label directions and restrictions for each individual product you have in your rotation since all products are different.

**Integrating post-emergence herbicides into the program**

Post-emergence herbicides control newly emerged and established weeds. While they may effectively eliminate existing weeds, they provide poor residual weed control. For this reason, relying solely on post-emergence herbicides for weed control isn’t advised for long-term success.

Post-emergence formulations are categorized as selective or non-selective and systemic or contact. Post-emergence herbicides are most effective on younger weeds, but some products can control the target weed at any growth stage.

Know your post-emergence herbicides since some eliminate only specific types of weeds listed on the label. Labels also list plants tolerant to the product, meaning the product is safe on these “selective” species. For sedge control, the herbicide product must specifically state the sedge species name or it’s not intended to control it.

Non-selective post-emergence herbicides eliminate many weed species, but can severely injure plants. To avoid harming plants, non-selective applications should be limited to pre-planting treatments, spot treatments or directed to—but not over the top of—desirable plants.

Activity to the target weeds is classified as systemic or contact. Systemic herbicides move slowly through and kill the entire weed, whereas contact herbicides rapidly burn down the portion of the weed that came in direct contact with the chemical application. For weeds with regenerating underground vegetative plant parts, a systemic herbicide can provide complete control.
Keys to weed control success
Keeping weeds under control is vital for high-quality crop production. While the weeds and the crops involved are numerous, the solutions are as simple as keeping these few points top of mind when developing a weed management program:

- Know when and where to apply herbicides. Follow label instructions and don’t apply herbicides in liner beds or cell trays when rooting cuttings. Hand weeding is still necessary in these sensitive planting environments.

- Manage weeds around the perimeter of the operation to prevent seed/vegetative encroachment on healthy plants in containers. In addition to targeting weeds in plant blocks, keep non-production areas—such as gravel areas and ditch banks—clean of all weed seed and vegetative propagules.

- Rotate herbicides to minimize resistance and improve weed control.

- Help your herbicide investment work more effectively by choosing the correct combination of herbicides with proper timing of applications to fit weed growth cycles.

- Choose granular or liquid herbicide formulations based on your operation, budgets and personnel. Effective herbicides can be found with either formulation type.

By taking the basic steps to develop a weed management program, growing operations can refocus labor efforts on plant production tasks that improve quality and profit margins.

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