Weed Control: Herbicide or Cultural Management?

Introduction

A simple problem that affects landscapes by appearance, value, and health and the agriculture industry by yields and quality is the common weed. Weed control is a growing concern for our farmers and for individual or commercial lawn care. With the issue on the rise, herbicide use is growing while bringing many different products and methods to the market. The use of glyphosate (Roundup) has controlled many dominant weed species like Palmer amaranth (May, & Murdock, 2002). “Glyphosate is a nonselective herbicide that kills both annual and perennial grass and broadleaf weeds as well as woody species” (Bertram, & Pederson, 2004 p. 462).

Most farmers use herbicides to control their weeds to achieve results in yields, quality, and production. But there is another way for controlling weeds. “Cultural management is the use of mowing, fertilization, irrigation, cultivation, planting, and turfgrass selection to affect weed populations” (Busey, 2003 p. 1899). Both aspects control weeds and it depends on the user to which one is best for the job.

Herbicides

“Crabgrass infestation of Kentucky bluegrass was unacceptable without the use of herbicides (Busey, 2003 p. 1907)”. Herbicide use is the most common form of weed management used today. Many farmers rely on the results gained from herbicides every year due to the increase in revenues from crop yields. Glyphosate-resistant herbicides were planted on 77% of the U.S. cotton hectarage in 2002 confirming that herbicide use was dominant (May, Bourland, & Nichols, 2003).

Herbicides greatly increase the yields and quality of crops due to the fast elimination of weeds that deprive crops from water and nutrients. When not accessed, weed infestation is one of the top problems that farmers will encounter for loss in yields and quality. Widespread trust in herbicides has made them almost mandatory in the farming industry.

Cultural Management

Growers rely on cultural management because it reduces the dependency on herbicides. Cultural management is used on an individuals’ belief or choice that their yard will be healthier by being chemical free. Techniques used in cultural management are affective for weed control but can require intense maintenance and time. Some techniques that are used consist of:

- Choosing specific turfgrass species
- Rapid establishment of turfgrass
- Mowing heights
- Returning old clipping to the yard

Herbicide Testing Trials in Cotton

The U.S. cotton industry was introduced to Glyphosate-resistant cultivars in 1997 with limited or no public testing in Official Cultivar Trials (OCTs) to evaluate cultivars
in production (May, et al., 2002). Since nonglyphosate-resistant crops are killed by applications of glyphosate, growers have chosen to use glyphosate-resistant cultivars without data from the trials due to experience from failed nontransgenic cultivars and benefits that can be gained from herbicides. Trials were held so research could be obtained on when and how to apply glyphosate to glyphosate-resistant cultivars.

The trials reported that specific applications at certain times are mandatory for results from glyphosate. Growers should apply glyphosate topically until the four-leaf stage. “Thereafter, glyphosate must be carefully post-directed such that minimal leaf contact occurs; otherwise, yield loss can result (Kerby and Voth, 1998, as cited on May, 2004). Pollen fertility can be decreased and yields can be lost due to improper topical applications or applying after the four-leaf stage.

**Cultural Management Techniques in Turfgrass**

By choosing specific grass species weeds can be managed without the use of herbicides. “A well-adapted cultivar establishes and covers the ground quickly, and may persist for many years, thus providing few gaps in the canopy for weeds to colonize” (Busey, 2003 p. 1899). This allows the grass to spread quickly but will take longer than herbicide use.

“Mowing height is the clearest and most well documented cultural factor affecting weed populations” (Busey, 2003 p. 1899). Mowing in a timely manner at lower heights will cut seedheads preventing them from maturing. The placement of old grass clippings back to the turf can reduce weed infestation. Recycled nutrients from mulches or fertilizers can enhance turfs and reduce weed encroachment.

**Cultural Management vs. Herbicides**

“Cultural management of weeds in turfgrass is reportedly a gradual process, with reduction in weed populations sometimes taking place across years” (Busey, 2003 p. 1907). While the use of cultural management is affective over time, the use of herbicides can achieve results faster.

In cultural management mowing heights are a technique that is used but not all turfs might be able to obtain very short or tall heights. This would make them non applicable for cultural weed control. Herbicides can be applied to any turf given its special requirements of application.

**Conclusion**

Weed control affects everyone in the agricultural or lawn care industry. The choice between herbicides or cultural management for weed control is based on individual preference. When choosing herbicides or cultural management you must know which one will benefit you the most.

Cultural management of weeds in turfgrass is a gradual process, with reduction in weed populations taking place across years. In comparison, chemical management of weeds is often successful in a matter of weeks (Busey, et al., 2003). Cultural management is a great way to control weeds but requires time and patience. Cultural management is a technique that is applied more to the personal lawn care rather than to the agricultural industry. Herbicides are very quick efficient way that most of the U.S. is using for weed control.
Audience

U.S. lawn care specialists can choose between herbicides or cultural management, depending on their personal preference or which is better for their business. The use of herbicides would benefit individuals in the agricultural industry while cultural management could not. Cultural management is a good way for lawn care specialist to maintain a landscape that is chemical free, but will take more time and patience than herbicides.

References


