WEEDS

Minnesota Department of Agriculture • Integrated Pest Management Fact Sheet Series

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SUBJECT: Weed Management on School Grounds and Athletic Fields

Integrated Pest Management (IPM) strategies can be successfully applied to managing weeds in lawns and athletic fields. A cornerstone of IPM for weeds is accurate identification along with developing an understanding of their growth habits and biology. This knowledge along with the weed history of a site are important steps in designing and implementing an appropriate control strategy.

Learning the Weeds

One of the first tasks in implementing an IPM program for weeds is to learn about the weeds themselves. Lawn weeds can be divided into two groups based on the way the shoot emerges from the seed: **monocots** have a single seed leaf and **dicots** have two seed leaves. In addition, monocots have the "veins" in the leaves running parallel to each other while the vein pattern in dicots is more netlike or branched. Most monocot weeds in turf belong to the *Graminae* or Grass family. Dicots are broadleaf plants and belong to many different plant families.

Weeds can be further divided according to how long they live. **Perennial** plants live for more than two years although they may produce seed every year. **Biennial** plants require two years to complete their life cycle. They store up food reserves in leaves and roots the first year and flower and produce seed the second year. **Annuals** germinate from seed, grow, flower and produce seed in one season. **Summer annuals** germinate in the spring, grow, flower and complete their lifecycle by fall. **Winter annuals** germinate in the fall or late winter and mature in late spring or early summer.

There are many printed resources for help in identifying weeds. You may also wish to consult your U of MN County Extension office for additional help.

Weed Growth Stages & Control Strategies

Most methods of weed control are directed at the growth stage of the weed. **Pre-emergence** control is directed at destroying the weed seedlings as they begin to germinate but before they emerge from the ground. This method usually involves the use of a chemical herbicide. The most common use is for control of annual grasses such as crabgrass before they emerge in the spring.

Post-emergence control is directed at visible, growing plants after they have emerged from the ground. This method may or may not involve the use of a chemical herbicide. This is usually the method of control for many of our common broadleaf plants such as dandelion.

When Herbicides are Needed

The practice of IPM does not preclude the use of a chemical herbicide. However, their use is often considered only after other weed management strategies have provided inadequate control. Herbicides may also be used as an initial treatment to reduce the weed competition while cultural practices to restore the turf are initiated.

When the use of herbicides is being considered, always read and check product labels to be sure the intended target weeds are controlled and will not harm non-target plants. Herbicides are generally grouped by their ability to control certain types or groups of weeds, **selective**, or all green vegetation to which it is applied, **non-selective**.

Controlling dandelions or crabgrass in a bluegrass lawn without harming the bluegrass are examples of selective control. Eliminating all vegetation under a fence line or from cracks in an asphalt parking lot would be examples of non-selective control.

Maintenance Zones and Standards

One of the best strategies to launch a turf weed IPM program is to determine what turf areas need what level of care. For example, the high school varsity football field would require a much higher level of care than an elementary school playground field.

As determinations regarding levels of maintenance are made for the various turf areas on a site and across a school district, a matrix of **Maintenance Zones** (**MZ**) will be created. That is, those areas requiring the greatest level of care and the most weed free surface would be considered a MZ 1. Each MZ will have a set of **Standards** that spell out the kind and level of maintenance to be used in that MZ. As the MZ number increases the level of maintenance decreases and weed tolerance increases. That is, the standards are not as rigorous for a MZ 3 as they would be for MZ 1. Typically there are three or four designated MZ categories. While it is beyond the scope of this fact sheet to describe all of the cultural practices that make up the MZ standards, some typical weed tolerance levels are listed below.

Figure 1 is a stylized portrayal of several different levels of maintenance zones on a given school site. Within a school district, these would collectively make up the maintenance zone matrix mentioned above.

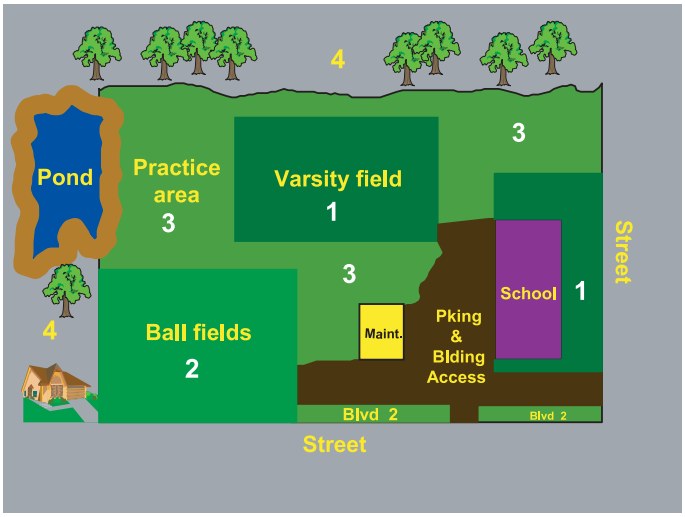

Figure 1. Sketch of possible school maintenance zones.

MZ-1: These areas have the greatest expectation for a uniform, relatively weed free surface. They are typically reserved for highly visible turf areas or the premier athletic fields within the school district. There are usually only a few turf areas within this maintenance zone designation and weed tolerance levels are often established at 15% or less. That is, weeds comprise 15% or less of the turf area.[1]

MZ-2: These are areas with relatively good turf density and vigor but up to 30% may be covered with weeds and no more than 10% bare ground.[1] Typically, these areas would include multi-purpose turf areas and most general use athletic fields.

MZ-3: Typically these areas would have moderate to poor turf quality with 50% or more of the area covered with weeds. Parts of the field may be bare ground but this should be kept to no more than 10% for safety reasons.[1] Examples would be general use fields and playgrounds, elementary school fields, and practice areas at primary or secondary schools.

MZ-4: In these areas the primary vegetation cover may or may not be grasses. The only weed control in these areas may be related to controlling certain undesirable weeds from invading adjacent finer turf areas either by seed or vegetatively such as through runners. Examples would include areas such as ditches, fence lines, adjacent woodland or field edges receiving little to no maintenance including mowing. State determined noxious weeds would also need to be controlled in these areas.

Monitoring for the presence of weeds, how many there are and where they occur will be an ongoing practice. This will be important in regularly assessing the impact current cultural practices and/or field usage are having on the presence or absence of weeds. For example, increasing amounts of prostrate knotweed, pineapple weed or broadleaf plantain are indicators of increasing soil compaction.

Modifying Cultural Practices

Although somewhat time consuming initially, establishing maintenance zones and their accompanying standards is an important step in the process of putting together a useful IPM program. However, other changes in cultural practices to improve turfgrass competitiveness against weeds can be implemented immediately. Two such examples include mowing and aerification.

Raising mowing heights will increase the potential depth of turfgrass rooting and help shade the soil surface thereby decreasing the amount of necessary sunlight for weed seed germination. Deeper rooting means a greater degree of stress tolerance as the plant will have access to a greater volume of soil in which to obtain water and nutrients. Where shorter heights may be required, provide supplemental irrigation and fertility to maintain turfgrass density and minimize stress.

Provide a healthier soil environment for turfgrass roots by increasing the use of *aerification to combat soil compaction problems*. This will help turfgrasses root deeper and enhance soil microbial activity. If at all possible perform aerification during those times when most of our problem weed seeds are not likely to be germinating. This would generally mean avoiding late April, May, June and July in the Twin Cities area. Cores of soil removed by the aerifier and deposited on the surface will likely have some weed seeds in them. Once exposed to sunlight and moisture they will germinate and potentially establish themselves in the turf.

In summary, a healthy, dense turf is still the best weed control strategy. However, it is not always possible to provide the optimum turfgrass growing conditions in every area. Establishing maintenance zones and standards will help set appropriate quality and use levels for all turf areas. When weeds do occur, identify them accurately and select appropriate weed control strategies.

[1] Information adapted from Wisconsin's School Integrated Pest Management Manual

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