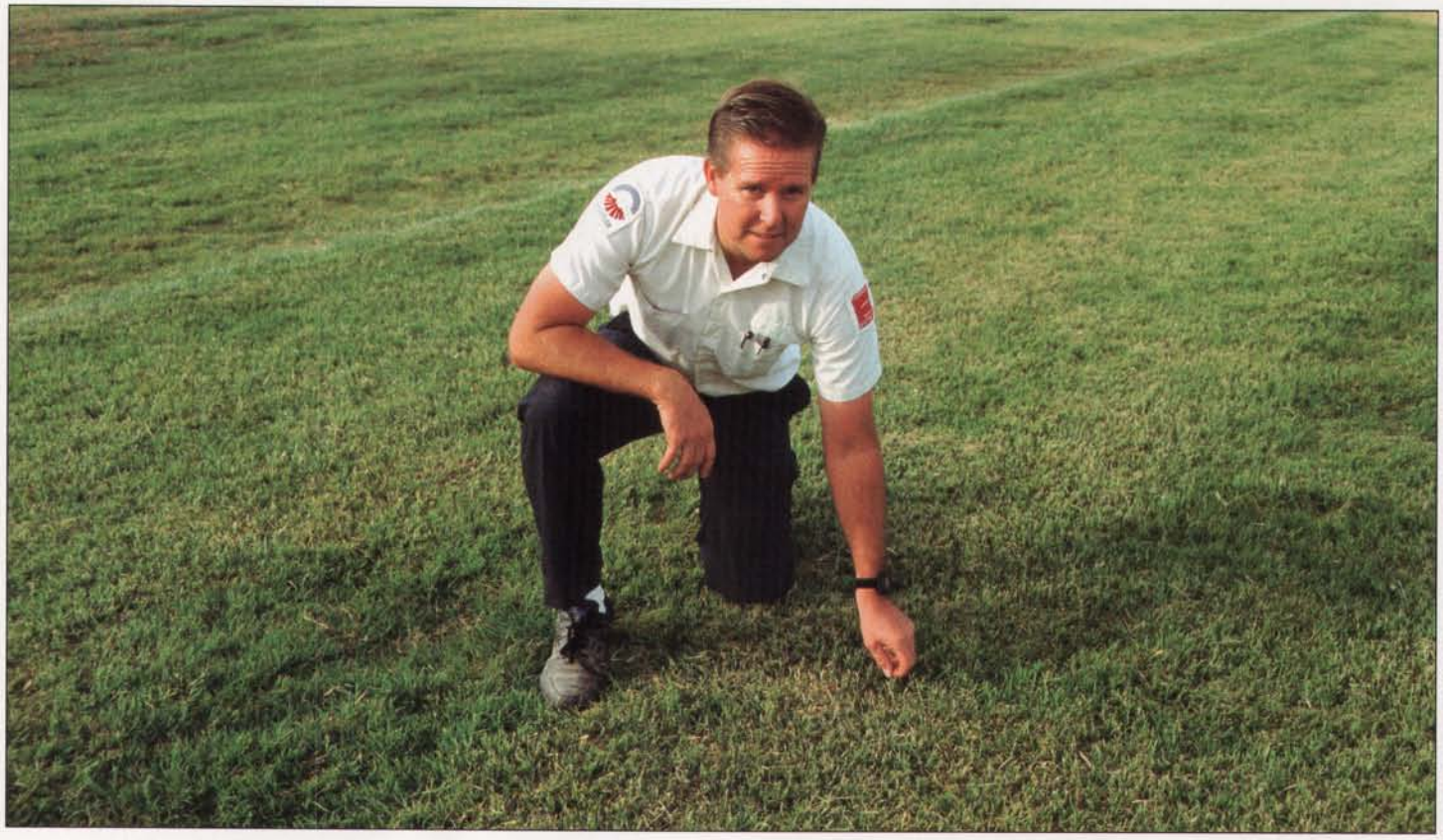
Chandler Arizona Parks Department

Chandler, Arizona



Chandler Arizona selected Primavera bermudagrass for all fifteen of the new soccer fields they seeded in 1994 and 1995. In addition, they are using Primavera on all the city parks and grounds.

According to Kris Kircher, maintenance coordinator, they have used common bermudagrass before but had problems with allergic reactions among the players. Then they tried Mid-iron bermudagrass but is was very susceptible to pearl scale. The third variety they tested was Primavera. Kris was really impressed with its quick germination and establishment. It stayed greener longer in the fall and greened-up earlier in the spring than any of the other seeded types they tested. Primavera also was resistant to pearl scale, so their problems were solved.

Kris, and his crew of four, were able to convert old cattle corrals to excellent quality soccer fields. The San Tan Soccer Association plays on the fields nine months out of the year, and with the use by other groups, there are soccer games almost every day of the week throughout the entire season. The quality of the playing surface is excellent throughout the year. The number of injuries and loss of players have been greatly reduced with the dense turf they are able to produce with Primavera. It has been stated by numerous authorities that Chandler has the best soccer fields in the Phoenix area.

The work done by Kris and his crew is impressive, especially when one realizes that it was done on a minimum budget.

"Primavera is a high quality, lower cost alternative to the standard turf varieties sold only in sod or stolon forms." *Kris Kircher, Maintenance Coordinator*

Spring Seeding

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grass and other warm season turf seed, the temperature range is warmer, from 68 degrees F to 95 degrees F.

Comparing these laboratory conditions to field conditions, we find that fall and spring seasons most closely duplicate the ideal laboratory conditions. During the fall and spring, we have cool night temperatures with more dark hours than light hours and warmer daytime temperatures. This is one of the primary reasons that it is easier to germinate seeds in the fall and spring than it is in the middle of the summer.

Seed-to-Soil

Seed-to-soil contact also is basic to successful germination and seedling establishment. In northern climates, where freezing and thawing occur, seed could be broadcast on top of the ground to work itself into the soil with the freeze/thaw cycles. While this practice will work, it does carry a high risk of failure because seed-to-soil contact is dependent on the freeze/thaw cycles. In addition, under heavy rainfall, seed may float and wash to another area.

A better method of successful spring seedings in thin turfgrass stands is the use of slicer seeder machines. This type of equipment will slice small, thin grooves into the soil from an eighth to a quarter inch deep. Immediately behind this slicing action, seed is dropped into the groove and the soil will collapse over the groove and cover the seed. This method of seeding is much more successful than the broadcast method by itself.

If a slicer seeder is not available, other innovative techniques may be used to achieve seed-to-soil contact. This could consist of a drag harrow, spike harrow, rake or any other type of equipment that will scarify the top quarter inch of soil in a thin turf stand. Normally, the damage to existing turf is minimal if the equipment used isn't too harsh or severe. After the soil is scarified, apply seed and go over the area again with the same piece of equipment to work the seed into the soil or use a less abrasive piece of equipment such as a drag mat to cover the seed with soil.

Fertility

Another basic factor to follow for spring seeding, or any time you seed, unless it is on a weekly basis, is to use a starter fertilizer. A starter fertilizer contains nitrogen, phosphorous, and potash, with the phosphorous rate being greater than that of the nitrogen and potash.

Examples of starter fertilizers may be 19-26-5 or 16-25-12. In seeding, the objective is to apply about one pound of phosphorous per 1,000 square feet. With the example of 19-26-5, to meet the one pound of phosphorous rate, you would apply 3.85 pounds of actual fertilizer material per 1,000 square feet. This in turn would deliver .73 actual pounds of nitrogen, one actual pound of phosphorous, and .19 actual pounds of potash. (See box for calculation details.)

Germinating seedlings and young seedling plants need ample amounts of phosphorous and supplemental amounts of nitrogen and potash to become established quickly. With starter fertilizer, one can shorten the establishment period by two to three weeks.

Weeds and Water

With spring seeding, there also is danger that crabgrass and other annual grasses will become established. If this is a concern or a problem, siduron is the only pre-emergence herbicide that can be used to control germinating grassy annual weeds while permitting the desirable turfgrass to germinate and grow. Use the pre-emergent herbicide siduron at a rate of six pounds of active ingredient per acre. With the combination of siduron and starter fertilizer, successful seedlings can be established with little or no crabgrass infestation.

Moisture conditions are vital for seedling success. Soil moisture must be adequate and present on a continuous basis for at least the first twenty to thirty days. Any drying during this period brings a high probability that the seedling will die. Once this occurs, there is no way to revive that seed again, no matter how much we water. This moisture concept also helps explain the importance of seed-to-soil contact. Seed in contact with the soil has a greater probability of direct contact with moisture and has less exposure to the drying effects of sunlight or air. Most seedling failures are caused by inadequate continuous soil moisture during the first thirty days.

Seeding Rates

Seeding rates are not only the basis for successful seedings but also are important from a budget perspective.

There are times that much more seed is used than is needed because of the fear of failure. There is such a condition as too much seed. With high seeding rates, there is a risk of pythium disease, damping off and overcrowding of seedlings that result in weak plants that will not provide wear tolerance or survive under other stress factors. With the correct seeding rates, the turfgrass plants will be much healthier and provide better wear tolerance.

Seeding rates for different species are based on the number of seeds per pound and the results of research seeding trials evaluating different rates. For the improved Kentucky bluegrass varieties, there is a range from 1 1/2 pounds to three pounds per 1,000 square feet. Normally, a two pound per 1,000 square feet seeding rate is adequate.

Improved perennial ryegrass seeding rates may vary from three to five pounds per 1,000 square feet, with four pounds being the norm. Higher rates for use as permanent turf may result in weaker plants. The exception to this recommended practice is the use of perennial ryegrass for winter overseeding in warm season turf. Rates for winter overseeding may range from five pounds to 25 pounds of seed per 1,000 square feet. This type of seeding is intended to provide a temporary turf cover for the winter playing season only. Therefore, we must distinguish between seeding rates for permanent turf versus that for winter play only.

The criteria or objectives for some fields may require the use of the tall fescue species. Seed of tall fescue is large, resulting in fewer seeds per pound, and thus requiring higher seeding rates. Seeding rates should range from five to ten pounds per 1,000 square feet, with a norm of six to eight pounds.

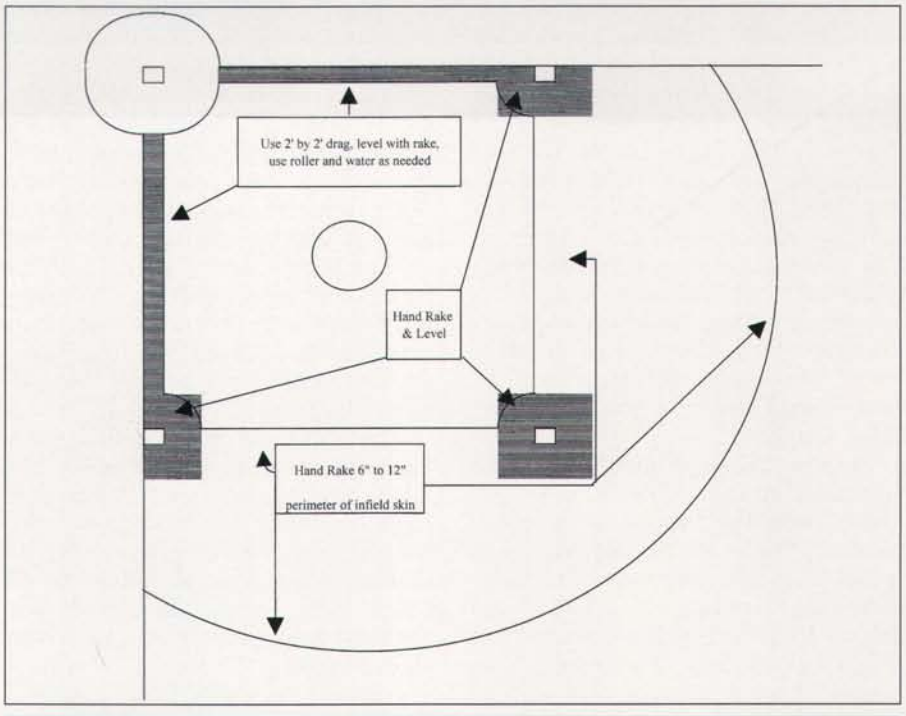
Seeded bermudagrass varieties should be applied at a rate of one and a half to three pounds per 1,000 square feet.

Many seed recommendations call for seed mixtures between two or more species to capitalize on various performance strengths. A popular type mixture includes Kentucky bluegrass and perennial ryegrass mixed at various percentages based on the performance objectives. Seed rates for this type of mixture will range from two to four pounds per 1,000 square feet.

Another basic factor in seeding success is seed quality, but that topic deserves separate coverage. Do be aware that quality input produces quality results.

For successful spring seedings, you must practice the old cliché used in sports — get back to basics. Concentrate on the basics of moisture, temperature, daylight length, seed-to-soil contact, and seeding rates. If you use basic agronomic practices correctly, there is a high probability that your spring seedings will be successful and meet everyone's expectations. ❑

Eugene Mayer is Technical Training and Support Manager for The Scotts Company, Marysville, Ohio, and secretary of the national Sports Turf Managers Association.



Step One: Hand rake and level where the infield drag cannot be used as well as in trouble spots around the bases. Diagrams courtesy: Dave Ashman.

Infield Grooming

By Dave Ashman

Remember Coach John Wooden's words of wisdom, "If you spend too much time learning the tricks of the trade, you may never learn the trade." This saying seems like it was written for turf managers as well as athletes.

Use the skinned area "fundamentals" outlined below to provide consistent playing conditions. Completing these procedures will keep the surface manageable while maintaining safe playing conditions. Safety and consistency are the key elements of a balanced plan. Maintaining proper conditions for teams to train and compete is your job.

General Guidelines

The following items should be included in the maintenance plan for working the skinned areas.

1. All skinned areas of the field need regular maintenance. The mound and home plate have special protocol to restore the desired conditions. The infield skin, the warning track, the "on deck" circle and other areas (some fields have coaching boxes, plate access paths, etc.) require different protocol to restore the desired conditions. In your maintenance plan, you should schedule labor hours to work these areas. In a competitive situation the mound, home plate, base paths and infield skin will require daily work. The warning track and other areas should be worked once a week at a minimum.

2. Water is important to the skinned areas. Moisture keeps the base firm yet the top 1/4 inch soft, and assists in the reduction of damage from wind erosion. The correct amount of moisture will provide a higher level of playability and makes maintenance of the surface easier.

3. A conditioner such as calcine clay will assist in maintaining the correct level of moisture in the skinned area. Most conditioners are tools for water management in the playing surface. Some conditioners and amendments such as peat can assist in reducing maintenance costs.

4. The application of water should be as close to simulating rainfall as possible. Hold the nozzle of the hose as high as comfortable and provide a slight arc to the stream of water. There are several brands of quality nozzles that should be available in your area.

5. As you prepare a field for practice, train your staff as if you are preparing for a game. In this case time will not be an issue if something goes wrong. There will be plenty of time to fix any problems without game day pressure. Practice before the first game to get the routine down.

6. Practice preparations should be done in the morning (weather permitting) to allow enough time for the surface to dry. Use the irrigation system to cover as much of the infield skin as possible. In the areas where the system cannot reach, use the hose to water those areas. If too much water is accidentally applied there is usually enough time for the skin to dry.

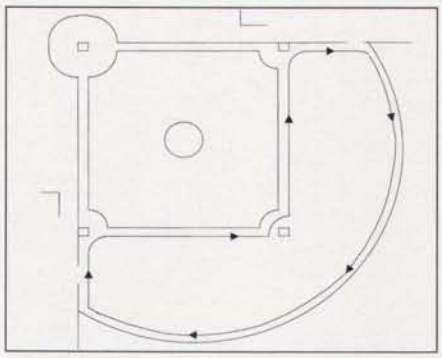
7. Always tarp the mound, home plate and the bases when the irrigation system is operating.

8. When completing game preparations, timing is the key element of this

process. You want to allow enough time for the skin to reach optimum conditions prior to the start of the game. Complete this process using a hose and not the irrigation system. Uniform distribution of water is critical to achieving the desired playing conditions. You want the skin damp, but not soaked. A good consistent color along with an absence of puddles, standing water or clumps of material will be the benchmark for the correct amount of water on the groomed surface.

9. Sweeping the turf edges will prevent materials from building up in the turf causing a "lip" to form. To complete this procedure, take a broom or a flex rake and sweep all loose material lying on the turf back onto the skinned surface. Then remove any grass that is swept onto the infield skin.

10. The nail drag is the best kept secret of major league turf managers. This should be done as often as possible, a minimum of once a week. This will keep the top 3/8 to 5/8 inch loose and friable. Not only does it make the field safer by relieving compaction, but it makes the surface easier to groom. If there is a compaction problem, add weight to the nail drag — which will force the drag to scarify a little deeper into the skinned area.



Step Two: Drag the perimeter of the infield skin. Do this twice, once in each direction, and start and stop in a different spot each time you drag the field.

11. The skinned area should be dragged daily throughout the year. This process will keep the infield skin in a playable condition year round. You want the skin to be loose, level, and consistent. There are many ways to complete this step; however, there are rules that should be strictly followed.

The skinned area must be slightly moist before any nail dragging can begin.

It is important to drag the field slowly. The slower the speed, the more consistent the results. Dragging the field quickly will spread infield mix where you do not want it and will create an uneven surface.

To begin the process, slowly drag around the perimeter of the skinned area first, then begin your dragging pattern. It is important to leave at least a six-inch buffer between the drag and the edge of the turf while dragging. This will prevent infield mix from being pushed up into the edge of the turf by the drag. Use a rake and scarify the six-inch buffer area. You should **alternate the starting and stopping points daily** or you will create high and low spots on the

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Infield Grooming

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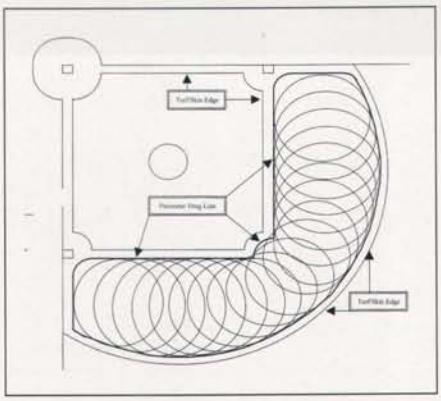
skinned area. Always distribute the small pile of material that accumulates on the drag evenly with a landscape rake.

12. Following the nail drag procedure, drag your field with a rigid screen drag equipped with a leveling bar on the front edge. This assists in leveling the material and filling the low spots.

13. Flexible drags have a habit of dipping into the low spots and doing little to restore the grade of the area. A rigid drag will fill the low spots and make the surface level. To achieve the same benefits as dragging, you can use a landscape rake to scarify the base paths. This should be done lengthwise instead of side to side. Side-to-side raking will push loose material into the turf and create a "bowled out" path. It is beneficial to complete this process after edging to restore the even plane to the "turf/skin" edge. The base paths should be firmer than the infield skin.



Step Three: Drag the entire infield skin (twice in each direction). Use large, overlapping circles and keep a safe distance from the turf. Drive slowly and at a consistent speed.

The players require traction to increase their running speed. They also want bunts to roll down the base path and not die in the loose material. What conditions does the coach want?

Plan of Action

Recommended equipment and materials: Bunker rake, drag mat, nail drag, t-head rake, landscape rake, rotary spreader, warehouse broom, hose, spray nozzle, watering can or Hudson sprayer, materials — calcine clay, infield mix and water.

1. Sweep the infield edges, remove and store bases, then install caps.
2. Evaluate the infield, look for high and low spots.
3. Hand rake the 1st, 2nd and 3rd base areas, especially the low spots from sliding, etc.
4. Moisten (lightly) the skinned area.
5. Nail drag and add material where needed.
6. Drag the skinned area with a leveling bar drag.
7. Rake the baselines.
8. Water down the skinned areas, with an ample amount of water without pounding. Do not allow a hose to drag across the skinned area!

Dave Ashman is head of the consulting firm Ashman & Associates in Long Beach, CA. The above comes from his book Sports Facilities Management.


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Photo courtesy: Sharyn Luka

Characteristics of Insecticides

By Mary Own, Extension Specialist, and Dr. Patricia Vittum, Entomologist

How do you decide which pesticide to use? First consider the characteristics of the materials available, then determine which fits into your management plan and site scheme best. Several of these qualities are summarized in the accompanying table of pesticides available for insect management on athletic fields today.

Chemical Class

Table 1 lists the four chemical classes into which turf insecticides fall: organophosphates, carbamates, synthetic pyrethroids and chloronicotinyls. These classes refer to the molecular structure of the insecticide. Most turf insecticides affect the target insect by interfering with the nervous system of the insect in some way. If an insect develops the ability to metabolize, that is, to break down an insecticide, it can break down other insecticides in the same chemical class.

Therefore, it is important to avoid using insecticides in the same chemical class repeatedly. Just changing from one material to another within the same class will not prevent the development of resistance. A wise turf manager will alternate classes of pesticides from year to year or at least switch to another class within a three-year cycle of use.

Effectiveness

For each insect pest there are usually several turf insecticides which work quite well. However, there may be some materials which are labeled for use against a particular pest which actually do not work as well as you might hope.

Check with your colleagues for their experiences in the field under conditions similar to yours. Many university turfgrass researchers conduct field trials to determine efficacy of materials under local conditions. Consult with them and extension professionals to determine which materials are most likely to be the most effective in your area. Be sure to evaluate the effectiveness of applications you make yourself, so for future reference you know what works best on your own site.

Speed of Efficacy

How long does it take for the pesticide to work on the pest? How long after the application will the target insect be affected? When the window of opportunity is short, as when trying to control a population of grubs in midspring in the northeast, then a relatively fast acting material might be in order.

Some insecticides (for example, trichlorfon) begin to kill insects within a couple of days after application. Other insecticides (for example, imidacloprid or isofenphos) may take a couple of weeks to begin to affect the target population. If the pest population is not noticed until late in the recommended time to treat (or even after that period has passed) you probably should choose one of the faster acting products. However, if circumstances call for application early in the recommended treatment period, one of the slower acting products would be appropriate.

Residual Activity

How long will the material remain effective against the target? Some insecticides such as trichlorfon and some of the pyrethroids break down quickly, within a few days after application. Others remain active for a few weeks (most of the turf insecticides currently available). Still others such as imidacloprid potentially remain active for ten weeks or more. The optimum timing of application of a material will depend in part on this residual activity. For example, if trichlorfon is applied early in a treatment period, it may break down and be gone before all of the insects have emerged, and so may not control a population adequately. If a slow acting but long lasting product is used late in a treatment period, it may not work fast enough, and some target insect damage may occur before the material becomes effective.

Formulation

Insecticides may be applied in a granular form with a spreader or in a sprayable form (applied using water with a sprayer). Sprayable formulations include: emulsifiable concentrate (oil-based liquid), wettable powder, flowable (water-based liquid) or water dispersible granules. Each formulation has advantages and disadvantages. As a general rule, sprayable formulations of a given active ingredient will begin to be effective slightly

CHEMICAL CLASS	COMMON NAME	TRADE NAME	SPEED OF EFFICACY	RESIDUAL	MOBILITY
ORGANOPHOSPHATE					
	acephate	Orthene	relatively fast	short	very mobile
	chlorpyrifos	Dursban	intermediate	intermediate	immobile
	ethoprop	Mocap	intermediate	intermediate	intermediate
	fonofos	Crusade, Mainstay	intermediate	intermediate	intermediate
	isazophos	Triumph	fast	relatively long	relatively mobile
	isofenphos	Oftanol	slow	relatively long	relatively immobile
	trichlofon	Proxol, Dylox	fast	short	very mobile
CARBAMATE					
	bendiocarb	Turcam	intermediate	intermediate	intermediate
	carbaryl	Sevin, Sevimol	intermediate	intermediate	intermediate
SYNTHETIC PYRETHROID					
	bifenthrin	Talstar	fast	long	variable
	cyfluthrin	Tempo	relatively fast	intermediate	variable
	lambda-cyhalothrin	Scimitar	relatively fast		variable
CHLORONICOTINYL					
	imidacloprid	Merit	very slow	long	relatively immobile

SPEED OF EFFICACY: fast = 1-3 days; intermediate = 3-7 days; slow = 7-14 days; very slow = 2-3 weeks.

RESIDUAL: short = 1-2 weeks; intermediate = 3-6 weeks; relatively long 5-8 weeks; long = more than 2 months.

Note: these characteristics are guidelines and may vary depending on the air and soil temperatures, soil moisture, rainfall or irrigation as well as the target insect.

quicker than granular formulations of the same active ingredient.

Toxicity

Insecticides usually interfere with insect nervous systems, but they can also affect human nervous systems in a similar manner. Fortunately, the dose necessary to affect an insect is several orders of magnitude lower than the dose which affects a human. Nevertheless, some turf insecticides can be somewhat toxic to people or other vertebrates and carry a **WARNING** statement on the label. In comparison, insecticides which can be used by the general public for turf use carry a **CAUTION** statement on the label.

Remember that those at highest risk for exposure to pesticides are the applicators themselves, especially during mixing and loading operations. All precautions in terms of material handling, safety equipment, appropriate clothing, spray applications and correct use of equipment should be carefully followed.

Some insecticides are relatively toxic to many kinds of insects and other "non-target" organisms, including insect predators and parasites and earthworms. The carbamates tend to be relatively toxic to earthworms, although normally the earthworm population bounces back within a few weeks. Carbaryl is extremely toxic to honeybees. Ethoprop appears to be quite toxic to several beneficial insects. Diazinon, while it is labeled for several turf damaging insects, cannot be used on large open areas of turf as it poses a significant threat to waterfowl that may congregate on these areas. Several other insecticides appear to have relatively minor (or unmeasurable) effects on non-target organisms.

Mobility

Will this material move away from the intended target site? The mobility of a material should be carefully considered when applications are made near environmentally sensitive areas. For instance, though trichlorfon, a very mobile material, might be considered for grub control when a very small window of opportunity is available, it probably should not be used near areas of environmental sensitivity.

How well will this material move to the site where the target insect is active? Chlorpyrifos and bifenthrin are readily tied up by organic matter, and thus may not be able to penetrate a heavy thatch when aimed at a root feeding grub population. They are probably best used for surface or leaf feeding insects.

The bottom line is that, when you, an athletic field manager, have determined that the most effective and appropriate course of action open to you is the use of an insecticide, you should consider the different characteristics of the materials available. Select the insecticide with the characteristics which best fit your situation. Follow all label directions, safety precautions, and local, state and federal regulations in the application process. Finally, evaluate the success of the application, and keep an accurate record of how well it worked for you. ❑

From Milwaukee

By Dave Ashman

Harry Gill was a founding member of the STMA, a sports turf manager par excellence and tireless practical joker. Those who knew him well remember him as a person who always had a twinkle in his eye and a warm smile.

Freshman Orientation

The grounds staff had just completed the final touches on the field before the Green Bay Packers game. The crew met in the usual spot on the field. Harry asked each staff member a few questions to make sure the tasks were completed. Everything was good to go. The newest member of the staff asked Harry if he needed anything else done before they left. This was just enough of an opening for Harry.

Harry signaled the rest of the crew with a wink, and then he began to look around for any items that needed additional attention. Harry pretended to be shocked at his own forgetfulness and told the apprentice that he had forgotten to put out the "Line of Scrimmage." The apprentice naturally volunteered to complete the task.

Harry and the staff tried to describe exactly what a line of scrimmage looked like. "It was about this long and this big around, and I think I saw it by the players' entrance to the dugout," Harry said.

While the apprentice went to look by the dugout, the rest of the crew split up. Each took a turn prompting the apprentice to look in another location. The apprentice asked for help from the other people on the field. The television camera crew, the NFL officials as well as a few others didn't help at all. They just laughed.

Harry Gill shows off a new turf aerifier at Milwaukee's County Stadium. Photo courtesy: Kent W. Kurtz.

Finally the apprentice approached Harry and told him the bad news. Harry's crew presented the apprentice with a three-foot-long section of rope and then explained what the line of scrimmage is on a football field. The apprentice learned well and became a good turf manager.

This individual eventually assisted in training other new staff members in Harry's special study classes. Course work included: the key to the batter's box; the bucket of steam; muffler grease, and a few others. These classes became traditional rites of passage for Harry's rookie turf managers. As Harry says, "It's what you learn after you know it all that really matters."

I would like to thank the following people for their contributions to this column: Suz Trusty, STMA National; Mike Schiller, STMA president; Dave Mellor, County Stadium; and Steve Guise, Valley Crest.

If you have a story or anecdote you would like to share, write it down (include your name and phone number) and send it to: Ashman & Associates, 3164 North Greenbrier Road, Long Beach, CA 90808. ❑