Using plant protectants economically

by George M. Kozelnicky

Plant protectants are generally divided into herbicides, fungicides and insecticides. The EPA includes in its definition of pesticides other compounds such as certain surfactants and growth regulators, and such things as rodent-, pisc-, mollusc-, "icides", etc. For the purposes of our discussion here we will consider all of these as a group.

How can we economize in this area? We actually need to know how much pesticide costs are now before we can show a need for economy.

Two sets of data obtained last year are available. The firm, Harris, Kerr, Forster, sampling 100 clubs found that the annual maintenance cost per hole is $7244, + $467 over two years ago. This is $130,382 for an entire 18-hole course. The G.C.S.A.A. survey, based on a better sampling of 1168 clubs states the cost per hole to be $5632, + $748 over three years ago.

Regulations increase costs

The average annual cost of 'pesticides' for an 18-hole course is $4298 ($239 per hole). This is four percent of the entire annual budget (109,501) and may appear to be an insignificant area in which to attempt to economize. However, the costs associated with this area are subject to the same criteria and influences as all others, but unlike others, are directly affected by outside agencies such as the EPA which impose regulations.

Regulations and laws always seem to increase costs. Because of this you can count on the cost of product to rise, some products may well be unavailable in the future, and you will be told implicitly how you *must* use a product.

Before we use a plant protectant we need to have a reason for its use; i.e., we anticipate, or have, a problem. The first thing is to be aware of what the problem could be, or is. This requires foreknowledge on our part of many things. The more we educate ourselves about weeds, insects, diseases and other pests, the less expensive our operations will be and we *will* cut costs. If anything, our expertise will reduce the number of mistakes we are liable to make.

Weather records are useful tools

Knowledge of the life cycle of a pest is of value to us in knowing when it is vulnerable so that we can inflict damage upon it. Except in the case of certain fungi it does no good to apply a chemical to a pest which is not there. And since pest appearance is strongly influenced by environmental conditions, one must be aware of these also.

Keeping daily weather records is not a useless thing; over a period of years these can be a useful tool and reliable guide in planning your budget for expenditures of chemicals.

A good example of use of weather knowledge (especially where irrigation is not available) is the timing of the application of preemergence herbicides to take advantage of rains. A ½-inch rain is required for maximum effectiveness. If you miss a rain after having applied the chemical, you may well lose its effect. It costs money if you have to re-apply or you don't get control.

Another aspect: when the label says the chemical should not be applied when temperatures are too warm, do you go ahead and apply regardless of the stated temperature just because the job is set up? Convenience can result in loss of something and that something is usually measured in dollars and cents.

Knowledge of what a certain chemical can do is essential to your doing a job most economically. You need to know whether the action is one of strict contact or if action is by assimilation and subsequent spread through the host plant. Is it the right chemical for the job? Does a certain chemical have selective properties or does it affect a broad group of pests? Does the chemical have long residual life or is it one that is rapidly dissipated? Is the chemical capable of being rendered ineffective by some environmental factor?

Safety is important. Are your people, your applicators, capable of applying toxic chemicals without injury to themselves or to the environment? More importantly, do you provide them with the necessary protection and with supervision? Loss of service by an employee is costly!

Careful buying saves dollars

Armed with this foreknowledge and with all proper turf management procedures in gear, you are now ready to introduce into your program the chemicals, plant protectants, you need. A few pointers in this area are appropriate.

Don't buy more than you need; and certainly don't buy a drum when a 5-gallon pail will do. Don't buy substitutes! Read, understand and abide by the label.

Acquaint yourself with the common names of the chemicals you will be using. Brand, or trade, names differ; common names do not. For example, the Koban you use for Pythium control is commonly, Terrazole; its other names are MF-344, Truban, and OM2424, but its only chemical name is 5-ethoxy-3-trichloromethyl-1,1,4-thiadiazole.

Watch out for trade names

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which may cover a number of different products, an example of which is Weedone. A can of Weedone may be PCP, 2,4,5-T, or a mixture of 2,4-D and 2,4,5-T,. The common name *Chlorothalonil* stands for the brands Daconil 2787 and Bravo (Forturf-1968). As a chemical it is known as *tetrachloroisoph-thalonitrile.*

The label also tells you how you must apply the product. It possesses all of the information about the product that you need to know and must meet every requirement imposed by the EPA. Then you may begin to prepare to apply it.

Check equipment calibration

Your application equipment must be in proper operating condition. This is the area in which economy begins. A worn-out pump causes loss of fuel, reduced pressure, and erratic spray pattern. Repair, where needed, pump and pressure regulator, leaking tanks and hose, replace innaccurate pressure gauges, improperly functioning agitators, and most importantly, nozzles.

Nozzles are available in brass, stainless steel, plastic, aluminum and tungsten-carbide metals. Your most economical compromise is the brass nozzle, followed by the stainless steel.

When your equipment is in good working order, you then need to calibrate it. Improperly calibrated equipment will also cost you money. Calibration procedures are readily available; such information even comes on the equipment itself.

There is nothing hard about calibrating a piece of equipment but you should be able to measure land.

The only true way is to determine the width of your nozzle coverage and then move a predetermined, measured distance. This gives you the squared area. In moving that distance, you have hung receptacles under each nozzle and collected the amount sprayed over that area. From this you can determine whether you are spraying too little, the required amount, or too much material.

Here is the place where you can determine if your nozzles are delivering uniformly. If there is a wide descrepancy in the amounts each delivers you may need to replace them all.

It saves money if you know the actual area you have to spray on your golf course. Guessing at an area will result in improper amount of product applied. There is the tendency to let the tank run out at this place or save what's left in the tank for the next place. Planning your route from area to area is an economical move.

Certainly, in order to get uniform coverage of all areas, predetermined speed set at time of calibration must be observed while applying on the golf course. Make an accurate measurement of your greens and other areas to which you will be applying chemicals.

Mix chemicals outside tank

Of seemingly insignificant importance but nevertheless of economic impact is the need to mix chemicals outside the tank. There is the opportunity for too much spillage when chemicals are loaded directly into the tank. And too, it's safer. Mix them outside the tank and then pour the mixture through the strainer into the partially-filled tank which should be in agitation.

Another important aspect is compatibility of chemicals. If you wish to mix two products together in order to apply once instead of twice, be sure the two chemicals are compatible. That is, be sure they are first miscible without settling out or coagulating and then not capable of being phytotoxic in the combination to grass.

When in doubt never mix

The wall of your chemical storage room, or that of your office, should have a compatibility chart. Don't mix if in doubt and certainly not if the chart shows incompatibility. Here again, convenience can result in wasted economy.

When the subject of prevention arises, it is possible to arouse many different opinions. The use of chemicals for prevention of a pest is common. The best example in our field is the use of pre-emergence herbicides for the control of the annuals Poa annua and crabgrass. Successes with goosegrass, however, have been far from satisfactory. The application of a pre-emerge appears to be more economical than relying on strict post-emergence control.

Of help here is the fact that the pre-emerge chemicals can be applied in the slacker times of golf play but most importantly, one application of pre-emerge beats 2, 3 or 4 of post-emerge.

As far as insect control is concerned, the erratic nature of the insect precludes our using insecticides for prevention. It is important that the insect be identified correctly and the chemical chosen be one that will do the most effective job the first time. Haphazard choices cost money.

Use proven disease controls

In the realm of prevention of diseases, one can apply the method to those which historically and potentially are capable of being very destructive. Such diseases are those

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which affect the root and crown of the grass plant and examples of which are the Pythiums, Helminthosporiums, snow molds, Fusarium blight and spring dead spot of bermudagrass. Most turf pathogens are found inhabiting the soil most of the time during their life cycle. In fact, it is from thence that the step to pathogenecity takes place.

Predict disease occurrences

The time of the occurrence and appearance of such diseases can be predicted with considerable accuracy. Therefore, the plan of attack is to reduce the potential of primary source of infection with a relatively inexpensive chemical so that when conditions become favorable for the full expression of disease, that expression will be easily met using a specific fungicide.

Specific fungicides usually have a higher price tag than broad spectrum chemicals. The important thing is that now one doesn't need to use as much specific fungicide. In contrast, should one wait for something like Pythium to appear, it's too late and no amount of specific fungicide is going to prevent loss of grass. The present method of control of snow molds is a good example of prevention. Snow mold chemicals are applied before snowfall. In this particular area, a good deal of economy can result.

Of course, how much economy can result from the foregoing suggestions is conditioned by each of your individual cases. As an example, fungicidal application to bermudagrass greens is less demanding than to bentgrass greens. Nevertheless, I hope that there are enough ideas here to stimulate your mind into delving into those areas where you can actually economize and find other areas in your operations where you can find other opportunities to economize. □

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