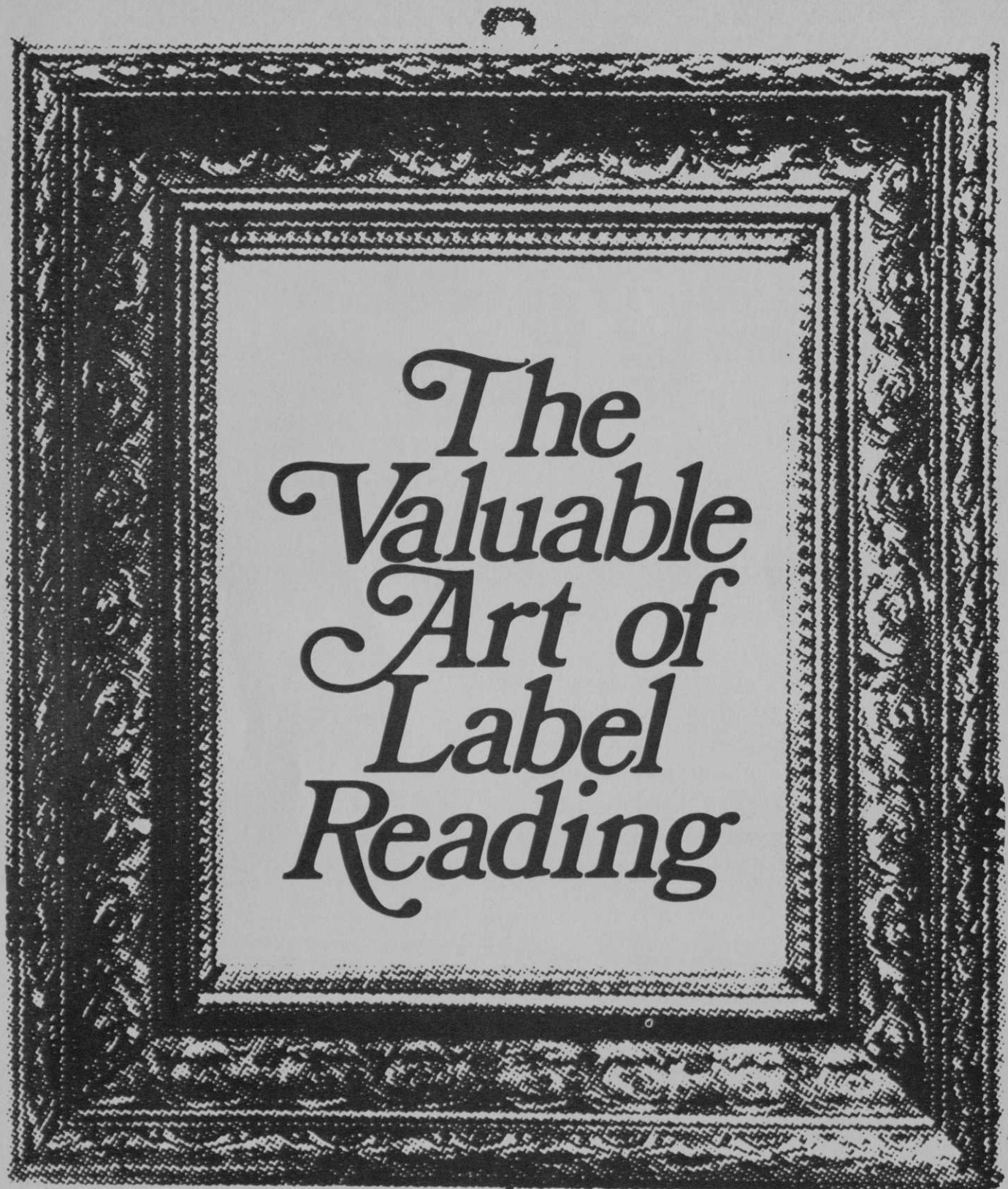

The Valuable Art of Label Reading

Superintendents may not be getting the most from their chemical dollars, simply because they are not reading properly the product labels

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The label on a turf chemical product, whether it's an herbicide, insecticide or fungicide, tells the superintendent how to use the product safely and effectively. So, simply, the first step for the superintendent is to read the label to determine how he can get the best results. The second, but not so simple step, is interpreting the information to fit the particular needs of his golf course. For example, most chemical labels give more than one rate. An herbicide label may read: "Use 15-20 pounds per acre in 40 gallons of water." Or a fungicide label may state: "Use 2-4 ounces per 1,000 square feet for control of Helminthosporium leaf spot; 4-6 ounces per 1,000 square feet for control of dollar spot."

The superintendent's initial reac-

tion to the alternative amounts may be to use the lower rate. The reasoning is sound: The less one uses, the less it costs. But it doesn't work that way when dealing with turf chemicals. The different rates are listed on the label for several important reasons.

Chemicals are used throughout the United States under widely varying conditions, such as soil type or the kinds of weeds present. The severity of a turf disease also can affect the amount of chemical that will be used. That's why there's a rate range on the label. Let's qualify the first step. Superintendents should read the *entire* label to better understand the exact way to use a given product under his particular set of circumstances.

Use exactly the amount recommended on the label, no more or less. Under-applying the chemical may do the job, but only for a short time; over-applying a chemical could ruin the course.

One cost-conscious superintendent under-applied his chemical to save money. He ended up wasting both time and money because he had to redo the job. Often, too, problems are not detected until it's too late. In cases where a pre-emergent chemical is used to control crabgrass or *Poa annua*, the superintendent will have to wait until the next year to re-apply and look out for weeds in the meantime. This type of situation seems so unnecessary when one considers that the dollar difference between the full rate and the "cut" rate only saved him $1.50 an acre. The extra labor cost to go back and redo the job comes to more than $1.50 an acre.

The opposite is the superintendent who thinks that if 15 pounds is recommended, then 18 pounds should really do the job. This type usually ends up with burned greens or fairways somewhere along the line, not to mention his high chemical costs. Although it's foolish to cut the rate to save a couple of dollars, it's equally as bad to waste money by over-applying. The danger in over-applying a chemical is the chance of damaging the course as well as exposing the environment to excessive chemicals.

Although chemicals are recommended with safety margins, some chemicals can burn turf at only two times the highest recommended rate. So make sure you use just the right amount and periodically check to make sure that your sprayer is calibrated correctly.

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The following briefly discusses the extensive testing that a product must undergo before it can be registered for use on turf. Additional testing is required before a product can be registered for use on food crops.

Scientists, working with agricultural pesticides spend from three to five years developing and testing a given compound before an application for registration is submitted to the Environmental Protection Agency (EPA). The final label is representative of the testing necessary to determine that the compound will work effectively and safely when used as directed.

A potential compound is first evaluated under controlled conditions in greenhouse tests. These tests determine if the compound has activity and on what type of pest. If a compound passes these tests, it is then taken to the field and tested under actual conditions—the same conditions that exist on a golf course.

At this stage of development, samples are given also to university, state and Federal researchers for further evaluation. This enables the company to examine results obtained from using the compound under widely varying conditions and climates. Behind the scenes, still another type of testing goes on.

Potential products are put through a series of toxicology studies. This is where the scientists determine the degree of safety to the user as well as the potential effects of the compounds on the environment. The following categories summarize the areas in which testing is required for registration:

1. Human safety and hazard
2. Fish and wildlife safety
3. Fate of the pesticide: (a) fate and movement in soils and (b) fate and movement in water.

These categories may involve dozens of different tests, both in the laboratory and in the field, depending on the particular test chemical and its proposed usage. The length of time of these studies varies from a few weeks to two years or more. In the laboratory, scientists test to determine how much of a given chemical causes death or adverse side effects when eaten, applied to the skin, eyes or taken up by breathing of laboratory animals.

In general terms, the degree of toxicity of a chemical is referred to as an LD_{50}. LD_{50} stands for the lethal dose it takes to kill 50 per cent of the animals in the test group. Therefore a product with an acute LD_{50} of 10 would be 10 times as toxic as a product with an LD_{50} of 100.

The numerous toxicology studies can take months, even years to complete to satisfy governmental requirements before a chemical can be registered for use in the United States. It's a sobering experience to review the many tests that may be required before registration of any new product. All pesticide labels will contain warnings, as well as words in bold print, such as danger, warning, caution, depending on how toxic a given compound is to the user.

The product has proven its efficiency. The scientists are sure it will not endanger the user or the environment. All facts and data are gathered and submitted to the EPA for approval. If the facts show that this product will help solve an important problem safely and effectively, the EPA will register the product. The product cannot be sold until accepted by EPA and a registration number has been assigned to the product. This EPA registration number must always appear on the container. The product can be sold and utilized only for uses as stated on the label.

Once the product has satisfied all EPA requirements and has been granted label registration, it is put on the market.

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Companies that manufacture agricultural pesticides spend time extensively testing and comparing their chemicals before and after they are put on the market. From these tests, efficacy data is taken and usually filed. Universities and other research facilities that perform comparison tests and hold field days often publish the results. Superintendents can ask their universities or chemical suppliers for these results, especially if they are using a product for the first time. With a little effort, the individual superintendent can collect this data. Or the local superintendents' associations could collect and print up in a binder the comparative data on products used in their area. Most distributors and suppliers would be willing to supply copies of their comparative data.

By comparing test results from several years, the superintendent can determine the one or two products that have performed consistently well in his area. This helps eliminate the guesswork out of selecting the best product for the job.

Finally, the terms ecology, environment and pollution have all become part of our daily vocabulary, and rightly so. Everyone is concerned about the increasing problem of pollution as the world's population continues to rise. However, reason needs to be applied in some areas. In some cases we must decide what kind of pollution is least desirous rather than think in terms of no pollution. For example, aren't mosquitoes a form of pollution, especially to those people sensitive to mosquito bites? How about dead turf from a disease or insect damage? What about a significant reduction in food production that could result if various pests are not controlled? However, the misuse of chemicals to control the above forms of pollution also is a hazard, and this is just one more very important reason to closely follow label directions. □

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agricultural college short courses, superintendents' regional meetings and the Green Section, superintendents have had an unusually good and voluntary training program for nearly 50 years. Club managers have had excellent schooling at Cornell, Michigan State, Houston and Denver universities for years and a valuable program of regional workshops. Beginning in the '50s, the PGA had winter short courses at Dunedin, Fla., and in California. These schools developed the seminars and other educational sessions over the past few years. Sectionally, there have been many practical spring business sessions for golf professionals and their assistants.

There has been very little along these lines for officials of private, public and daily-fee courses that employ the pros, superintendents and managers. You can't expect a private club official who is giving his time and successful business experience to take any special schooling for a job that is a sacrifice and that he will hold only a year or two.

For golf jobs that will be open in 1973, there will probably be more good men available than there will be good jobs. What the answer is to the imbalance between jobs and men I don't know, but I believe that finding the answer is going to test the value of the general management policy of golf club operation.

By the way, isn't the United States Golf Assn. Green Section's *Turf Management* more than overdue for a revision and up-dating? The first edition, edited and largely written by the late H. Burton Musser, was published in 1950. I recall there was one revised edition published. Progress in golf course methods, materials and management soon made parts of the revision museum pieces.

During the past several years there have been many changes in construction methods, machinery, pesticide, fungicide and herbicide use, grass strains, automatic watering and other areas.

The Green Section staff already has about three times the work an expert team of this sort could be expected to handle, but it always seems to take emergencies in stride.

With so many students now being schooled for the management of golf courses and other fine turf areas and the GCSAA certification program calling for a standard up-to-the minute manual, a revision is urgently needed. □