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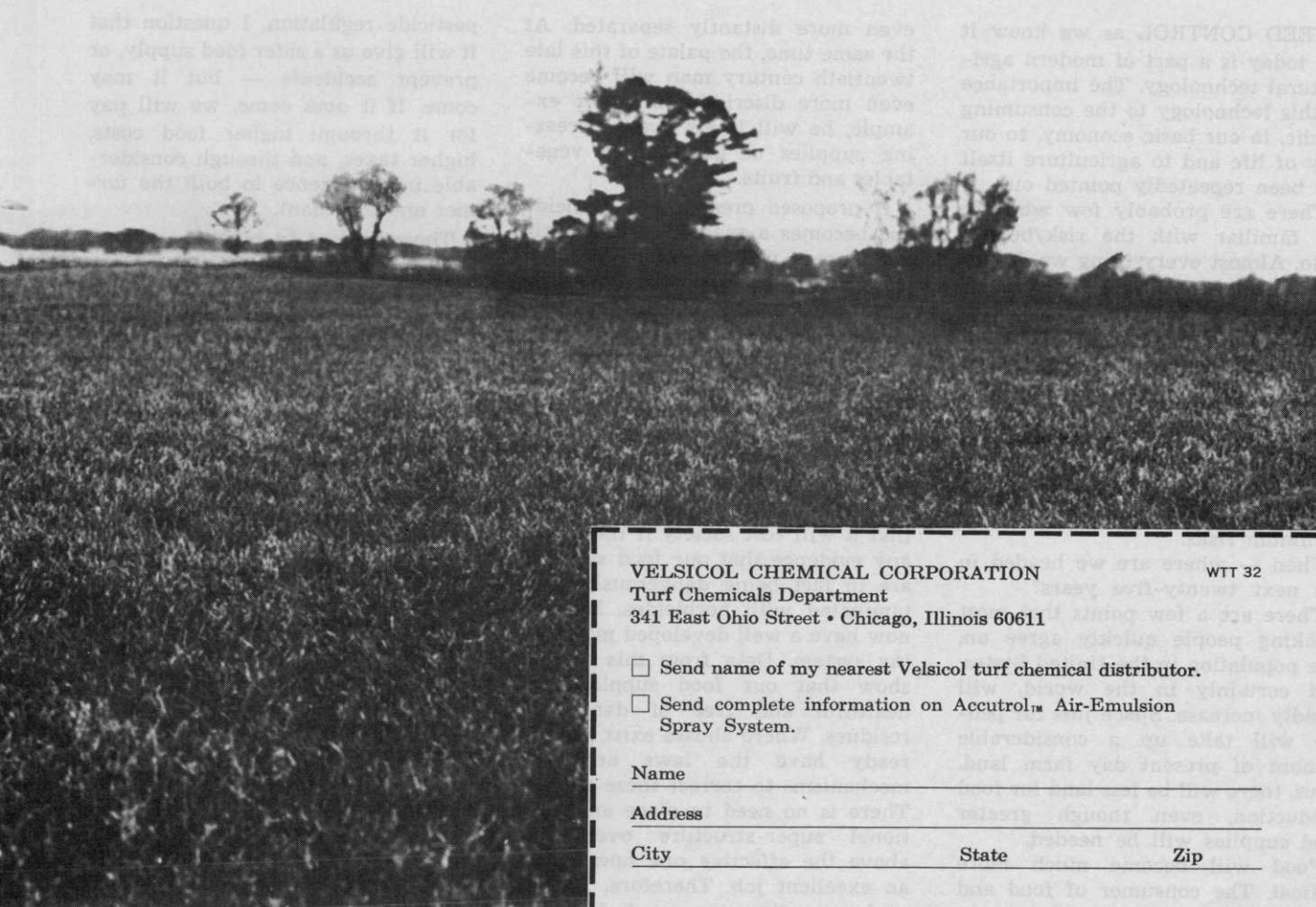
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WTT 32

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Industry's Role In Weed Science

By Dr. GLENN C. KLINGMAN

Director of Plant Science
Eli Lilly and Company
Greenfield, Indiana



Dr. Klingman has served as President of the Weed Science Society of America and the Southern Weed Science Society. He recently retired from North Carolina State University where he was active in teaching and weed control research. He has authored several books on weed control.

WEEED CONTROL as we know it today is a part of modern agricultural technology. The importance of this technology to the consuming public, to our basic economy, to our way of life and to agriculture itself has been repeatedly pointed out.

There are probably few who are not familiar with the risk/benefit ratio. Almost every thing we do has a risk/benefit attached to it.

Those of us that have worked in agriculture are convinced that in modern herbicide development the risks are very low compared to the benefits. The fact that in the United States we are enjoying a brief period in history when our ability to produce food exceeds our needs is due to our acceptance of these minimum risks.

Then — where are we headed in the next twenty-five years?

There are a few points that most thinking people quickly agree on. The population in the United States, and certainly in the world, will rapidly increase. Space just for people will take up a considerable amount of present day farm land. Thus, there will be less land for food production, even though greater food supplies will be needed.

Food will become much more critical. The consumer of food and the producer of food will become

even more distantly separated. At the same time, the palate of this late twentieth century man will become even more discriminating. For example, he will likely want increasing supplies of green leafy vegetables and fruits.

If proposed prescription pesticide use becomes a reality, certain agribusinesses will develop rapidly. Custom service may take a number of forms. Probably the first will be greatly increased custom application. We can also expect the organization of professional service groups providing technical advice and recommendations, and assistance to the farmer in meeting requirements.

I would agree with these proposed new regulations and the millions that it will cost society if there was any evidence that our food supplies are in fact being dangerously contaminated with herbicides. But we now have a well developed monitoring system. Data from this system show that our food supplies are healthful and free of dangerous residues. Where abuses exist, we already have the laws and the mechanisms to correct those abuses. There is no need to place an additional super-structure over and above the effective one now doing an excellent job. Therefore, I seriously question the need for this

pesticide regulation. I question that it will give us a safer food supply, or prevent accidents — but it may come. If it does come, we will pay for it through higher food costs, higher taxes, and through considerable inconvenience to both the farmer and merchant.

Those trained in biology are well acquainted with "survival of the fittest." Only within the past hundred years has there been adequate food plus developments in medicine to permit rapid increases in the human population. Through history whenever too many people or too many animals developed in a given area, nature quickly acted through famine or disease to bring about the needed balance. It was truly a survival of the fittest.

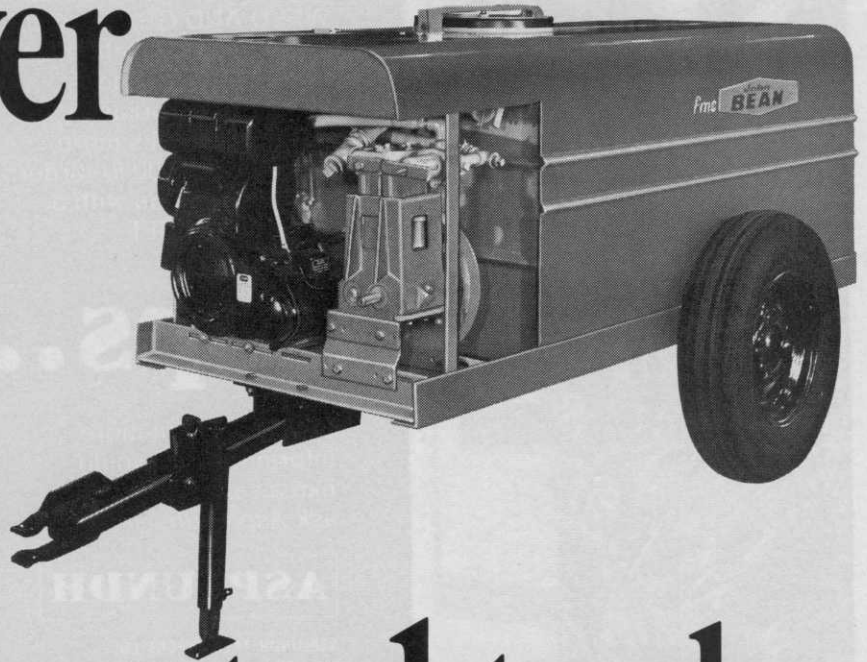
We should remember that those biological laws have not been repealed. Technology has simply made it possible for most of us to temporarily escape the full force of these biological laws.

The risk/benefit ratio of technology has certainly been in man's favor. I would hope that more ecologists recognize that herbicides can be used to manage the environment to the advantage of wildlife, birds, fish — and, thus, can be a friend to

(continued on page 24)

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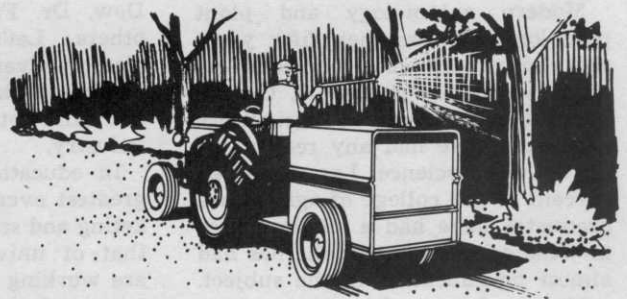
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INDUSTRY'S ROLE (from page 22) these species — just as they are a friend of man.

Let us consider weed science as we know it through education and research — and the effects that industry may have in the future.

The need for weed science education will increase during the next twenty-five years. Much of the confusion concerning pesticides and agricultural chemicals has total misunderstanding as its roots. Frequently, critics do not even understand elementary chemistry, elementary plant physiology and elementary ecology as it relates to agricultural production. The answer appears obvious. We must have better education in these areas.

Modern entomology and plant pathology are less than fifty years old, and modern weed science is less than twenty-five years old. Only a handful of college of agriculture graduates have had any real training in weed science. Less than ten percent of our college of agriculture graduates have had a single course in weed science. The public has had almost no education in the subject.

More and more, I hear comments

that industry must do more toward education in weed science. I readily admit that more education is needed. Industry may produce movies, slide sets, circulars, etc. thereby helping some.

However, education, per se, is not the job of industry. Industry education will remain product oriented — to gain more widespread and better use of their products.

Undergraduate and graduate university training is the cornerstone to better understanding and a better informed public. Others from industry that have supported increased university training in weed science include Dr. Hannah of Monsanto, Dr. Wolf of E. I. duPont, Mr. Adolphi of Geigy, Mr. Mullison of Dow, Dr. Fertig of Amchem, and others. Let's keep our thinking clear. Universities are for teaching and research. The challenge cannot and will not be adequately met by industry.

In education areas, probably the greatest overlap occurs in the marketing and sales area of industry and that of university extension. Both are working toward the adoption of new, and assumed to be, improved

practices. Both appeal to the same motives and senses. Having now worked reasonably close to both, I would say that there is almost no difference in personality, and capabilities of a good university extension worker and a really good industry salesman.

Dr. Don Davis of Auburn University and Dr. Larry Hannah of the Monsanto Company have alluded to the fact that the farmer is placing less and less emphasis on experiment station recommendations when he decides what herbicide to use. It would appear to me that this same trend has continued through the past five years. I would guess, however, that this varies from state to state, depending upon the adequacy of research data and the soundness of recommendations coming from the experiment station and extension service of the state.

I still maintain the view that research, including field research, should be done by the State Agricultural Experiment Station. Also I feel equally strong that the original concept of adult education, probably through demonstration, is an appro-

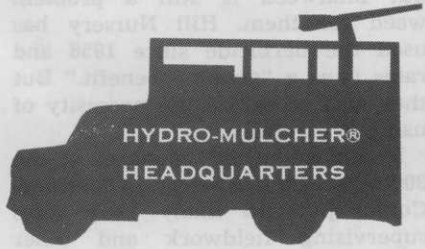
(continued on page 38)



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series until June or later," says Ahrens. "In the Northeast, fall or winter applications do not usually affect the growing of an oat cover crop the following September, an added advantage where winter erosion is a problem."

The researcher reports of an experimental simazine-trifluralin (Princep-Treflan) combination applied in the fall with "terrific results." He feels that combinations give the best utility, because one chemical will kill weeds not affected by the other. The granular forms "remain a very effective herbicide for fall use," while simazine wettable powder in spring controls weeds such as established chickweed.

"Nurserymen like granular herbicides because many are not equipped for spraying weed control chemicals. But no two nurseries are exactly alike in size and in what they grow, so both forms—granular and wettable powder—can be adapted to their needs and available equipment," Ahrens says.

For instance, the D. Hill Nursery at Dundee, Ill., uses a Hahn Hi-Boy sprayer and another 50-gallon sprayer for chemical weed control on its 750 acres.

Bill Kreutzfeld, vice-president in charge of production, says their weed control program is designed to give both lower production costs and better plant development.

Visitors to the Midwest Nursery and Landscape Expo held at the Hill Nursery in late July, 1971, were told, that the 'ideal' procedure calls for early land preparation. Quick Start liners or others are planted in alternate 44-inch beds, with plants on 11-inch centers. Princep is applied and followed immediately by 1½ inches of irrigation.

The irrigation activates the chemical in the top 1½ inches of soil. Kreutzfeld explained, "The application is done after the first cultivation in the spring, which is immediately after planting."

He believes his rate of four pounds an acre may be more than is needed, but bindweed is still a problem weed for them. Hill Nursery has used the herbicide since 1956 and rates it as a "genuine benefit." But they also recognize the necessity of using it carefully.

Frank Kogut, Jr., manager of the 300-acre Kogut Nursery in Meriden, Conn., puts in many busy days supervising fieldwork and other activities.

His main concern is spring weeds
(continued on page 54)



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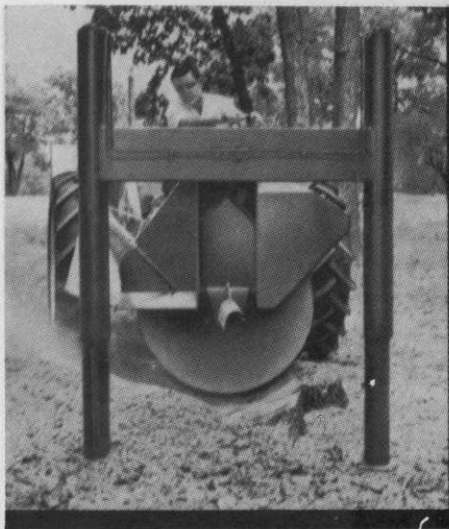
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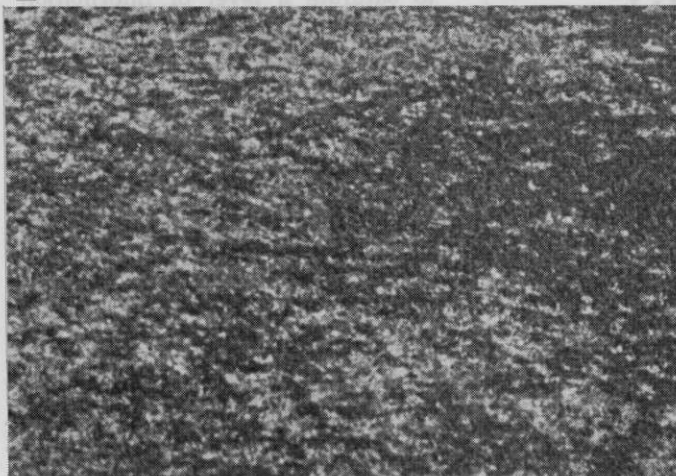
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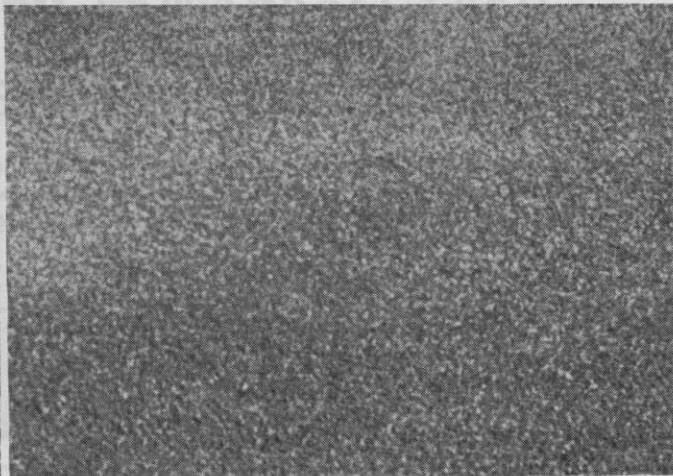


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CHEMICALS (from page 14)

what they are doing. They must have a thorough knowledge of herbicides and they must be able to establish a report with the public and highway personnel." The objective is to teach each man as much as he is capable of learning.

The program as it is now set up calls for a two year apprenticeship — before a man is qualified to apply herbicides. During the two years the men become familiar with the basic principles of weed and brush control, traffic conditions, mixing

and handling chemicals, and maintaining application equipment. Each man is then assigned equipment of his own which he is required to maintain. They are currently using primarily Myers sprayers designed for highway use.

Moffett contends that projecting the use of chemicals into a maintenance plan must be a carefully coordinated effort. Chemical application can accomplish one thing while mechanical mowing can do another, he says. Their interaction must be complimentary.

"We had to sell the idea of herbicides and plant growth regulators to various people in the districts," recalls Don Cober. "We had to learn who to contact. The key man in a district might be sold but if the man on the mower wasn't convinced, the program in that area would not be effective. We had to coordinate the actions of the district and our suggestions on the use of chemicals so they would be one. This involved winning the confidence of key people.

"We had to set goals. If it's to educate, you don't have to see many people. If it's to get the material on the ground, then you have to get out there. Originally our objective was to saturate a level of information about chemicals at a personnel level that you expect would go down the

THREE ECONOMICAL WAYS TO CONTROL WATER WEEDS AND/OR ALGAE

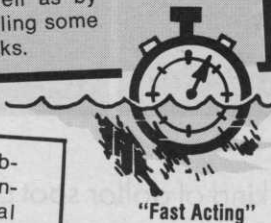
Depending on your specific requirement, Pennwalt makes available three different chemicals to rid lakes, ponds, streams or drainage canals of unsightly and often costly aquatic weeds or algae.

Select the aquatic herbicide to meet your needs . . .

Aquathol-Plus® kills 24 different submerged, emerged, or floating weeds by systematic action as well as by contact. Aquathol-Plus goes to work at once, killing some weeds right away while others die in 2 to 4 weeks.

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Aquatic herbicides are the most effective, economical, and generally, the easiest method for controlling unwanted weeds and algae. Ask your nearest Pennwalt Representative for more information to solve your specific aquatic weed problem.

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Richard C. Moffett, chief agronomist, Bureau of Landscape Architecture, Maryland State Highway Administration.

line; however, that didn't always get the material on the ground," he says. "As a result, I had to become a partial applicator in addition to salesman, supervisor and advisor."

In addition to the spray equipment assigned to the districts, the Roads Commission has two large capacity sprayers. One is a Myers air carrier unit developed for railroad ROW spraying. It is skid mounted with a 1000 gallon rust-proof tank. A two stage centrifugal pump capable of producing 100 gpm at 190 psi delivers material to eight broadcast nozzles and a 29 inch air carrier machine. It has the capacity of spraying material 40 to 50 feet from the road shoulder. Moffett uses this sprayer to apply maleic hydrazide, a turf growth regulator.

The second spraying unit is a redesigned 450 gallon off-the-road
(continued on page 40)

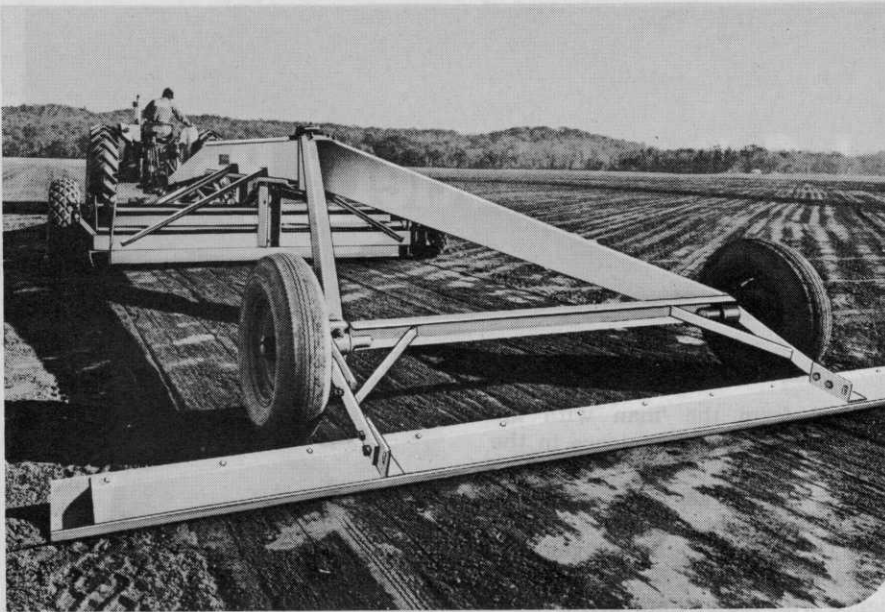


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Also for golf courses, cemeteries, landscape architects.

Eversman Smoothers combine in one machine a field plane, open bottom scraper and a complete tillage tool for superior seedbed preparation. Smooth, level fields make possible even seeding, uniform germination with uniform turf maturity and faster, precision harvesting on fields that are easy on equipment.

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The leveler's main wheels are placed outside the cutting blade for a specific reason. These wheels serve as *feeler gauges*. They follow the contour of the

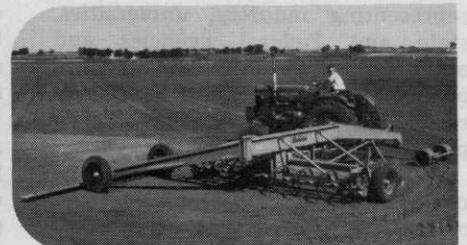
field and automatically adjust the cutting blade to the correct depth—independently of the tractor driver.

When these gauge wheels come to a high spot or ridge, they ride up on top of the ridge and this forces the blade to lower and cut through the ridge. The soil is then carried along by the blade until the gauge wheels go into a hole or depression in the field, which forces the blade to raise and fill the depression.

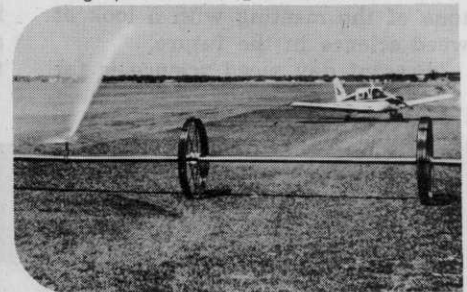
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Users Tell The Story

"We have been using Eversman levelers for over fifteen years," writes Dale Habenicht of H & E Sod Nursery, Inc., Tinley Park, Illinois. "Several other types were tried, but we've always found the Eversman to be the most satisfactory. They give us the smooth surface we are looking for—with easy maneuverability.

"The H & E Sod Nursery operates three farms consisting of 1300 acres. I commute between farms with my Cherokee 180 and use the sod fields that have been leveled by the Eversman for landing strips."

"We could not properly prepare our seedbeds without the Eversman Leveler," writes Parker Sherling, Manager of Princeton Turf Farms, Inc., Centerville, Maryland.

"In preparing our fields," Parker Sherling continues, "we instruct our operators that a field is not ready until a car can be driven in any direction at 40 miles per hour over the field. It's a joke, but we actually bring our fields to this condition.

"Our operators have also developed the skill where we can shape our drainage ditches with the same machines, thus saving the rental of additional equipment."

Southern Weed Science Society Report

NEARLY 800 weed control specialists helped celebrate 25 years of weed science when the Southern Weed Science Society met in Dallas in mid January. In what might be considered a time to reflect on past accomplishments and speculate on weed science in the future, delegates representing industry, universities, state and Federal agencies and others appeared optimistic in spite of the threat of increased legislation restricting the use of certain crop protectants.

Carrying out the theme of the conference, "After 25 years of weed control—what's next," Society president, Dr. Joseph R. Orsenigo of the University of Florida set the tone of the meeting with a look at weed science in the future.

"Present day weed science is far

removed from the 'man with the hoe' image and weed science in the '70's and beyond can be expected to follow the accelerating rate of change so commonplace today," he said. "Our discipline will develop as an independent and as a dependent science with major innovations from our own research efforts and from technological advances in other disciplinary areas, particularly engineering."

Orsenigo cited the applicability of UHF electromagnetic fields and laser methods to weed science now under study. He said that "despite the popular unreasoning attack on pesticides, chemical methods offer the most promising near future tools in vegetation management, crop and crop seed protectants, detoxifiers, weed seed germination stimu-



Dr. James G. Wilson, Professor of Research Pediatrics and Anatomy, Children's Hospital Research Foundation, College of Medicine, University of Cincinnati.

lators and plant modifiers. These will be selected, developed and utilized increasingly, each with built-in safeguards for the environment."

President Orsenigo told members that weed science must help to communicate with the non-agricultural 95 percent of our population and "carry the positive message of a viable agriculture that totally serves the common good."

The keynote address of the conference was a talk by Dr. James G. Wilson, professor of Research Pediatrics and Anatomy, Children's Hospital Research Foundation and the University of Cincinnati College of Medicine. Dr. Wilson drew much response from Society members in speaking on "The Teratogenic Potential of 2,4,5-T." This pesticide has received more notoriety and probably been the cause of more public concern than any other such substance except the insecticide DDT, he said. The herbicide has been accused of causing human birth defects in three areas of the world. He pointed out that the compound is teratogenic, "but so are hundreds of other commonly used drugs, plant products and environmental chemicals . . . the list of chemicals now known to be teratogenic in rats, mice or rabbits is so extensive that it is quite natural



Officers of the Southern Weed Science Society discuss the 25th anniversary. Standing (l-r) are: Turney J. Hernandez, President-Elect, E. I. Du Pont de Nemours & Co., Inc.; Dr. Joseph R. Orsenigo, President, Everglades Experiment Station; and Dr. Allen F. Wiese, Vice-President, Texas A&M University, Texas Agricultural Experiment Station.