Selective Weed Control Advancing, Mullison Tells 19th Southern Weed Conference in Jacksonville

Changing concepts in weed control was the theme at the 19th Annual Southern Weed Conference, Hotel Robert Meyer, Jacksonville, Fla., where nearly 1,000 representatives of colleges, industry, and government gathered Jan. 18-20. The three-day conference included nearly 20 talks on practical weed control methods for lawns, public and private grounds and rights-of-way, streams and ponds, rangelands, and forests.

Selective Herbicides Coming

"Tomorrow's weed controller will use the prescription approach," Dr. Wendell R. Mullison, of The Dow Chemical Co., Midland, Mich., viewed as the keynote speaker. "Herbicide X," he said, "will have greater biological activity and selectivity from the point of physiological tolerances. Herbicide persistence and decomposition will be controlled. We want the material to last exactly as long as it's needed, then disappear. New products will be safer to use, safe to man, animals, wildlife, and our environment in general.

"In addition to the Herbicide X, a selective seedicide may be developed, and certainly the related properties of desirable nematocidal and soil fungicidal action are being investigated."

Prior to 1940, Mullison recounted, only about 14 chemical weed killers were known, most of them inorganic compounds. Today, there are more than 125 well-known herbicides.

"The increased availability of a variety of materials," he added, "makes possible another concept in weed control, and I call this the 'prescription approach.' As our knowledge of weeds and herbicides grows, there will be not only more combinations available for the operator to mix in his tank, designed to solve specific problems, but there will also be more than one active ingredient in many commercial formulations."

Mullison explained that because of a higher level of education and the increasing labor shortage, the future weed controller will be much quicker to adopt new weed killers and novel application methods.

Chemical Mixes Kill Herbs

Recapping the modern trends for combination herbicide products, T. J. Hernandez, E. I. duPont de Nemours & Co., Wilmington, Del., said, "Bromacil or diuron weed killers are often used in combination with other weed killers. Some of these are chlorates, TCA, weed oils, and hormone-type weed killers. Bromacil or diuron combined with these materials makes use of the different vegetation control properties of each compound and therefore provides more efficient weed control."

Reviewing a few of the standard combinations used in the weed control industry, Hernandez outlined the dosages and mixtures available. "A combination of 3 to 8 lbs. of bromacil or 10 to 20 lbs. of diuron with 120 to 150 lbs. of chlorate-borate or chlorate-chloride mixtures has been used extensively by railroads and other industrial concerns. Chlorates in this combination provide good contact action. Also, they are highly soluble and readily move down into the root zone of deeply rooted plants. Bromacil and diuron prevent seedling regrowth by remaining near the surface. Higher rates are used for initial treatments and lower rates after perennials are eliminated.

"Bromacil or diuron applied at similar rates combined with 80 to 120 lbs. of TCA per acre have been very effective where bermudagrass is prevalent. TCA in the mixtures gives both contact and systemic toxic action.

"When hard-to-kill broadleaf weeds or vines are present, hormone-type weeed killers, 2,4-D or 2,4,5-T, with bromacil or diuron will improve overall control. Amine formulations are preferred because they are easier to mix and are less hazardous to adjacent desirable vegetation."

Hernandez stated that weed oils in combination with bromacil or diuron have been successfully used in the northern areas of the country to provide rapid top kill and residual control of annual weeds. "This combination has not been readily accepted in the southern areas of the country. There, oils contribute little to the control of hard-to-kill perennial grasses, such

New Southern Weed Conference officers elected to reign in 1966 are (from left): President-elect, Robert A. Mann, Tennessee Valley Authority, Chattanooga, Tenn.; Donald E. Davis, new President from Auburn University, Auburn, Ala.; Site Selection Chairman, James L. Taylor, Thompson-Hayward Chemical Co., Gainesville, Fla., and Secretary-Treasurer, H. H. Funderburk, Auburn University, Auburn, Ala.

as johnsongrass, bermudagrass, nutgrass, vasey, and dallisgrass."

Rain Affects Herbicides

Discussing the influence of rainfall on herbicides, Dr. Anson R. Cooke, Biological Research Director, Amchem Products, Inc., Ambler, Pa., pointed out that rainfall can influence the performance of certain preemergence herbicides.

"How much rainfall is necessary to activate a preemergence herbicide? How much rain must fall before the herbicide is leached from the zone of germinating weed seeds? How much rain does it take to move the herbicide to where the crop seed is germinating, with resulting injury to the crop?" Cooke attempted to answer these three questions by setting up a controlled study concentrated into a single growing season.

"From our tests," he announced, "conducted with artificial rain, we found that by substituting common, soluble formulations with less soluble derivatives of the same products, weed control often remained constantly high. This happened even when initial rainfall varied from 0.5 to 2 inches. The more soluble forms, on the other hand, often gave poorer weed control when carried too deeply by a single heavy rain of an inch or more."

Dr. Wendell R. Mullison, Dow Chemical Co., Midland, Mich., said, "Tomorrow's weed controller will use the prescription approach," adding trends will be toward more selective and predictable herbicides to give modern control.

With such knowledge, Cooke concluded, it may soon be possible to formulate preemergence herbicides on a more-or-less custom basis depending on the average normal rainfall for a given area. In an area with normally high rainfall, for example, a rather insoluble form of herbicide might be provided, while a more soluble form of the same weed killer might be furnished areas of normally low rainfall.

Weeds Crumble Asphalt

William J. Bowmer, of the Range Science Department, Texas A & M University, College Station, told attentive conferees that plants growing up through asphalt cause it to crumble and make repairs necessary. Bowmer announced that a pilot project is underway to study herbicides in asphalt by the Texas Transportation Institute at the university.

"In preliminary tests," Bowmer explained, "seven herbicides were selected and applied in three different methods: applied to open areas and left uncovered, applied to open soil and covered with an asphalt cap, and mixed with the asphalt before it was laid down. Results indicate that some oil-soluble herbicides may be effective when applied directly in asphalt, although the other methods show some promise." He added, past experience has shown that herbicides applied to the base material should be distributed through approximately the top ¼ inch to be most effective. However, a great deal more work needs to be done with herbicides in asphalt before recommendations can be made, he said.

'gatorweed Controls Tested

"The most effective control for floating mats of alligatorweed in Louisiana tests was obtained with 4½ lbs. of 2,4-D and 15 lbs. of diglycolic acid applied in 300 gals. of water per acre," Dr. J. A. Foret, Professor of Horticulture, University of Southwestern Louisiana, Lafayette, reported. Dr. Foret explained the testing of control methods for alligatorweed in Louisiana conducted by himself, Dr. S. L. Solymosy, and Dr. F. W. zurBurg, both Southwestern Louisiana U. staffers.

"One of our main weed troubles stems from the Chagres

River that flows at an average of 2,000 cu. ft. per second," J. S. Hearne, Chief of the Dredging Division of the Panama Canal Co., announced. "The river brings with it many thousands of all kinds of aquatic growths: waterhyacinth, waterlettuce, elodea, coontail, cabomba, many cords of driftwood, and grasses, to name a few.

Booms Used to Catch Drift

"Driftwood is caught by a huge boom across the river which funnels the drift into a lagoon where it is removed by a large rake. Much of the drift passes over or under the boom and must be gathered up by workboat crews," Hearne said while explaining methods used to keep the Panama Canal clear of aquatic plants.

"As far back as 1913, the waterhyacinth was a primary cause of trouble, and even today it has not been eradicated," Hearne explained. "In areas where there is a continuous stream flow entering the Canal channel and Gatun Lake, spraying is not the answer. The use of log booms, which are on all the streams emptying anywhere near the Canal channel, is one reason we have been able to keep water hyacinth under such good control," he added. "The booms have failed to resolve the problems of submersed weeds, because they slide under the floating booms and move with the currents to infest other areas." Hearne noted that elodea and coontail were controlled with outstanding success by using copper sulfate applied by hand or mechanical sprayers.

New experiments are being conducted with the assumption that each area in the Canal Zone will have its special set of characteristics. Underwater earth samples will be taken from the bottoms of various areas and placed in test containers to observe weed regrowth. Raw copper is one product being studied that may deter regrowth for long periods. One handicap, Hearne said, is that only a limited number of chemicals will be allowed in Gatun Lake because that water is used for drinking, swimming, cooking, and fishing.