ABILITY TO CHANGE, RESEARCH ARE VITAL ACCORDING TO BOARD

Alva P. Burkhalter, Ph.D.

Dr. Burkhalter is chief of the Bureau of Aquatic Plant Research and Control in Tallahassee, a division of the Florida Department of Natural Resources.

Burkhalter received his Ph.D. in plant physiology from Auburn University in 1970. His B.S. in forestry and M.S. in genetics were earned at the University of Georgia.

Burkhalter's latest research explores the use of the white amur for aquatic weed control in landlocked lakes used for irrigation. The exotic fish is banned in many states for fear of its effect on the ecological balance of the aquatic environment. Burkhalter thinks research on the fish will dispel such fears and legalize use of the fish in more states.

Burkhalter is a member of the Weed Science Society of America, the Aquatic Plant Management Society, (APMS), and is a past president of the Florida Chapter of APMS. Hobbies include hunting, fishing, guitar, banjo, golf, and basketball.

Aquatic Plant Management — the science, profession and the problems — is still in the early stages of development. Compared to childhood, it would now be in its rapidly expanding and growing adolescent years.

The science of Aquatic Plant Control has developed as branch or support function of many other major areas. Its earliest function was to assist commercial efforts by controlling plants that caused problems to navigation. From here it has expanded to other areas of concern — Fish and Wildlife, Public Health (Mosquito Control), agricultural irrigation and potable waters.

With the growing population of our nation and the increased emphasis on multiple usage of water, the aquatic plant managers of today must understand the various facets of aquatic plant control and how they differ, while at the same time relate to each other. This is becoming increasingly important because water used today for one purpose may be used tomorrow for another.

Aquatic plant problems are generally directly attributable to man's activities as he progresses. Man's increased mobility and world traveling have led to the introduction of exotic noxious aquatic plants that now plague many of our waterways. His pollution either from industrial, agricultural or domestic waste often provides excessive food stuff for their growth and mans designated usages of waters and conservation practices (navigation, irrigation, etc.) often mean that even the native plants that were heretofore no problem have subsequently become a problem in these types of waters.

Current trends in control necessitate that the aquatic plant manager of today be a "jack of all trades." Early aquatic plant control centers mainly on the use of machines of which similar methods are still used today. The most commonly used method of control at present is chemical, but rapid development is taking place in the area of biological control. Therefore, the managers of today must be part engineer, chemist, and biologist, and adapt rapidly as changes take place.

The nature of the problems are also rapidly changing. Early plant problems centered around floating and emergent species such as water hyacinth and alligatorweed, but submerged plants, such as Eurasian watermilfoil and hydrilla, are posing greater threats.

In summary, aquatic plant problems and control technology are rapidly changing, the future of aquatic plant management belongs to individuals who will do likewise.

Harry D. Niemczyk, Ph.D.

Dr. Niemczyk is Professor of Entomology for the Ohio Agricultural Research and Development Center in Wooster, a research facility of Ohio State University. He is also a consultant for Chem-Lawn Corp.

Niemczyk's research centers on insects of turf. Two examples of his research are the life cycle of the ataenius beetle and the characteristics of the winter grain mite. Both pests are not found on any registered pesticide label even though they can cause significant damage to turf. Niemczyk is working to collect information to make registration of pesticides for these minor pests more likely.

Niemczyk received his Ph.D. from Michigan State University. In 1974, he was presented with the Ohio Turfgrass Foundation Professional Excellence Award. He is a member of the Entomological Society of America, the American Society of Agronomy, the International Turfgrass Society, and the Ohio Turfgrass Foundation.

An ardent fisherman, Niemczyk often returns to Michigan with his wife and four children to fish for steelhead.

The single most significant event in turfgrass entomology was the labeling of DDT and later the chlorinated cyclodiene insecticides (aldrin, dieldrin, heptachlor, chlordane) for control of turf insects and, in the case of chlordane, crabgrass.

These compounds were used successfully for many years. In fact, they were so successful that research on turf insects declined at universities and agricultural experiment stations. The importance of insects in turfgrass management courses also declined in turf schools.

Another significant event occurred in the early 1960's when an instrument known as the gas chromatograph (GLC) was developed. The GLC provided the capability of measuring pesticide residues in parts per million. This sophisticated instrument was to have a major impact on the use of all pesticides. With the GLC we soon learned that DDT and the chlorinated cyclodienes left unacceptable residues in the environment, including the food chain. Paradoxically, the major advantageous characteristic of these compounds, long residual activity, ultimately led to their demise.

The residual characteristics of these insecticides led to other problems. Among the more serious was the development of insect strains resistant to them.

With the removal of aldrin, dieldrin, and heptachlor from use in the early 1970's and, more recently, chlordane, the few remaining turf research entomologists recognized the need to conduct research designed to provide substitutes for these insecticides. Their efforts, together with those of the chemical industry, led to the labelling of the organophosphates, diazinon, chlorpyrifos (dursban®), and trichlorfon (Dylox®-Proxol®) for grubs and other insect pests. While these insecticides generally provide good control of chinchbug, sod webwrom and other pests that inhabit the turf surface and thatch, they frequently provide only fair control of grubs that inhabit the soil. We now know that among the factors limiting their effectiveness against soil pests is the fact that the insecticide can be bound to the thatch before it reaches the target pest. Another major factor is that consumers are unaccustomed to using short residual insecticides, and therefore do not properly follow required irrigation and other procedures to immediately move the insecticide to the target.

Loss of the chlorinated cyclodiene insecticides means shifting from the "spread it and forget it" philosophy long associated with these compounds, to one of "reach the target pest NOW" necessary with organophosphates. This causes many problems. For the consumer it places new emphasis on the need for safety. It also means more attention must be given to rates and uniform distribution of the product. Proper distribution of liquid insecticides requires higher volumes of water than are

used for fungicides or herbicides, and few golf courses have equipment to apply granular insecticides properly. Applications must also be accurately timed because the long residual activity is not there to 'eventually' control the pest.

Now, more than ever before, the consumer must have knowledge of the target pest's life cycle. Many still do not understand why this is necessary when the objective is to kill the pest, not study it. The answer,of course, is that the life history points out when the insect is most vulnerable to control and therefore sets the time of application. Without that knowledge treatment timing is a guess.

The change in philosophy and need for new knowledge requires additional training. Unfortunately, extension entomology in most states is overburdened and does not have adequate personnel to provide the specific training turf managers and other consumers need. Frequently, the turf specialist, who is likely an agronomist or a horticulturist, finds himself called upon for such input. Since most of these specialists have had little or no formal training in entomology or insecticides and their use, the information communicated to the consumer can be inadequate and sometimes inaccurate. The need for extension entomologists and others with professional knowledge of turf insects and the principles of their control must be made known before the consumer's needs for information can be met properly.

The shift from long residual to short residual insecticides for control of insect pests of turf has clearly identified that more research is needed in turfgrass entomology. While most states have an agronomist or horticulturist doing research on the agronomic aspects of turf, there are about five turf research entomologists in the U.S. Little or no research has been done on control of recently "discovered" pests like the greenbug aphid and winter grain mite. With so few researchers it will be some time before information needed to form the basis for labelling controls for these pests can be developed. We must know more about such important matters as: (1) the duration of the residual effectiveness of insecticides currently in use; (2) the susceptibility or resistance of present turfgrass varieties and strains to insect injury; (3) the physical, chemical, and biological factors relating to the movement of insecticides through thatch; and (4) cross resistance characteristics of the southern chinchbug resistance to certain organophosphate insecticides . . . just to name a few.

In summary, the future requires more emphasis on research and extension in turfgrass entomology. Research must show how we can best use the insecticides and management practices we now have to accomplish control of turf pests. New compounds for turf insect control are simply not currently being developed, and prospects for the future look equally dim.

Virtually every segment of the turfgrass industry is in serious need of a basic foundation in the principles of dealing with today's insect problems. The state extension services and the industry must rise to meet this challenge by seeking people with professional expertise to communicate the needed information. If such people are not available, then let the need be known so we can begin training them **now.**