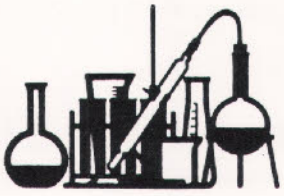

Herbicide Research

NEW GENERATION OF HERBICIDES DEVELOPED

Basic research has led to the development of a new generation of herbicides that some day will undoubtedly find their way into golf course management programs. This herbicide is nonpolluting and makes weeds literally "commit suicide" while leaving nontargeted plants unaffected. The work on this new group of herbicides has been done at the University of Illinois. The development work to this point has been with weeds that affect agricultural crops such as corn, barley and wheat. It is only a matter of time before other applications are available.

The active ingredient in the herbicide is an amino acid found in all plants and animals. It is used by weeds in creating the chlorophyll that gives them their green color and uses sunlight to produce food in the form of sugars. By spreading the amino acid over crops at night, weeds are given the chance to "load up" on the light sensitive substance so that when the sun comes out the next day the light reaction is so great that it kills the plants. This represents a whole new mechanism of killing plants.

These "laser" herbicides are a practical outgrowth of basic research into how plants produce chlorophyll. When it was discovered that different families of plants have different ways of producing chlorophyll, U of I plant physiologists decided to investigate if these differences could be exploited to produce a herbicide.

The prime ingredient of the new herbicide is delta-aminolae-vulnic acid, known as ALA, a critical substance in the manufacture of chlorophyll within plants. One family of plants, including such weeds as lambsquarter, mustard, red-root pigweed and common purslane, normally metabolize small amounts of ALA all day long. Loading them up with the substance at night creates a situation analogous to pouring gunpowder into a keg. When these biochemical precursors accumulate slowly and "burn" a little at a time as they accumulate, as happens in the daylight, nothing much more than a fizzle results. But if they are allowed to build up in large amounts and ignite them all at once with sunlight, the whole plant system explodes. The weeds, unable to metabolize so much ALA at once, wither and die within hours after sunrise. The key to the selectivity of the herbicide is the fact that corn, barley, oats and wheat are able to metabolize ALA even in large quantities. Other crops such as soybeans, kidney beans and cotton exhibit some severe leaf damage when exposed to ALA at night, but these plants usually recover and produce new leaves.

Generally, twenty-four hours after its application the laser herbicide has evaporated, leaving no trace in the environment. Scientists feel there is no environmental impact at all in using this herbicide.

This development represents a fundamental change in the way herbicides are usually discovered, through trial and error work with chemicals. The new understanding of basic biochemical processes in green plants should lead to more herbicides and other strains of specific crops, such as turfgrasses, that will exhibit traits needed by growers.

ROBERTS SEEKS INPUT ON GCSAA SCHOLARSHIP & RESEARCH

William R. Roberts, CGCS, WGCSA Vice-President, has accepted an invitation from John E. Laake, CGCS, Chairman of the GCSAA Scholarship & Research Committee, to serve on that Committee. Although the first formal article of business associated with this assignment will be a formal meeting to be held in conjunction with the GCSAA Conference in Washington, D.C., Roberts is soliciting the advice, input, comments and concerns of all WGCSA members, in advance, relative to the GCSAA S & R program in general and the following items in particular:

A.) What is the purpose of the Scholarship & Research program?
   1.) What is the number one priority of the S & R program?
   2.) Does the present S & R program address that number one priority?
   3.) What are other S & R priorities and does the present program adequately address them?
   4.) Should the program remain the same? Should the program be re-directed?

B.) If we continue to fund a Scholarship & Research program —
   1.) How should funds be raised?
   2.) Who is responsible for fund raising?
   3.) Should we solicit funds only from GCSAA members?
   4.) If we solicit funds from others (outside organizations), which ones and how?
   5.) Should we pursue joint fund raising with other organizations?

C.) What percentage of funds should go to Scholarship and what percentage of funds should go to Research?
   1.) Scholarship —
      a.) Should GCSAA evaluate schools? If so, how?
      b.) Should scholarships be given to two year students? Four year students? Mix?
      c.) What are the minimum and maximum dollar amounts to be given?
      d.) What qualifications are required of scholarship applicants and how should they be