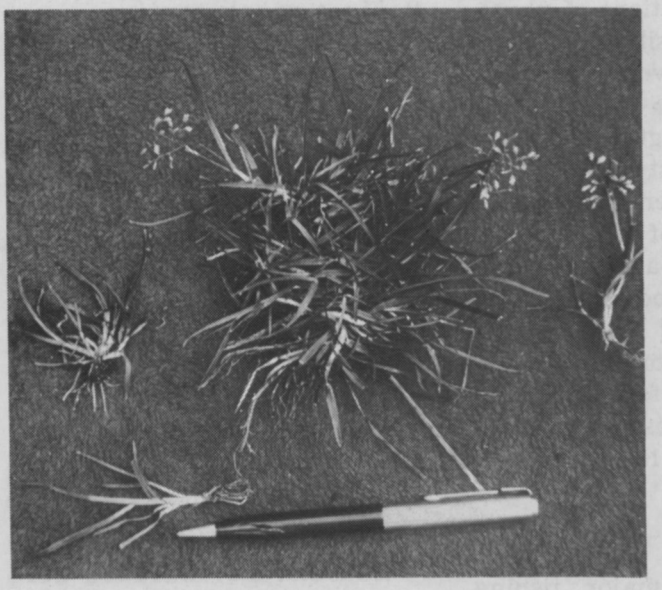

Relative size of **Poa Annua** plant, seedhead and parts may be compared with pencil.

Control Program

Poa Annua

By WILLIAM H. DANIEL
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ARSENIC toxicity can selectively remove *Poa annua* in turf, thus *Poa annua*-free turf is a reality already proven in research and on entire golf courses. Recently a speaker used kodachrome pictures from over 30 golf courses to illustrate observed progress in this. Currently over 300 courses have some control program underway.

A four-step program is basic:

(1) Add no more soluble phosphorus. Why juggle two items? Why build reserves higher?

(2) Start accumulating toxic arsenic. Repeat lighter application, get uniform distribution. Allow time for new grasses to grow and fill in;

(3) Start improving stand of desired turf by using Aero-blade seeder or any way to get seed into the soil; repeatedly overseed as space and weather permit;

(4) Short or cloudy days, wet soil and time favor selective *Poa annua* weakening. Chickweed, *Poa annua,* crabgrass and goosegrass are less tolerant to arsenic than bentgrass or bluegrass. Arsenic interferes with the transfer of carbohydrates within the susceptible species.

Several states have declared *Poa annua* a weed in seed. For example, in 1968 Florida required that the number of *Poa annua* seed per pound of grass seed be listed on the label. Further, seed is prohibited from sale if above 5,000 seed/lb. And, it is hoped this limit can be reduced after one year of review.

Basically there are five points relevant to the control of *Poa annua:*

- **TECHNOLOGY**
- **TOOLS** to accomplish the work
- **TECHNIQUES** of using men and equipment
- **TIMING** for plant and user benefit
- **TIME** for biological processes

What Is Poa Annua?

Let's describe *Poa annua. Poa* means "of the meadow" in Greek. This includes hundreds of species scattered almost world-wide, of which *pratensis, compressa* and *annua* are representatives. The early botanist seeing *Poa annua* germinate and produce seed in the same season, which was in contrast to perennial types, called it *annua,* i.e., it seeds in 6 to 8 weeks after germination under some conditions. Now, it is just like tomatoes, coleus, etc.; it will vegetatively increase until some adversity kills the plant parts. You have seen summer desiccation, severe disease smothering under ice as such damaging failure points. Also, you have seen a beautiful sheen of new *Poa annua* come up.

I recall such on August 5 at Cleveland Country Club one year. The cycle of a normal *Poa annua* plant under watered fairway conditions in Cleveland would include fall germination, winter survival, spring lushness, summertime weakening, some disease, some wilting and, when things get really tough, complete loss either in the winter under ice or in the summer; but then new germination occurs. We can break this cycle and reduce the

Poa Annua

Much work on annual bluegrass and other turf problems has been done at Purdue University, Lafayette, Ind. Visiting at last month's Midwest Turf Conference are Purdue stalwarts, J. B. Peterson, head of agronomy department, left, William H. Daniel, agronomist and author of this article, center, and Richard L. Kohls, dean of agriculture.

competitiveness of *Poa annua*—the technology is available. Examples of success have been observed, reports of progress have been disseminated.

Technology

Selective repression of existing *Poa annua* and selective prevention of new establishment are the keys to effective control. It is a small job to control *Poa annua;* The **big** job is to grow desired grass!

We know that arsenic accumulated in the rootzone can over-ride phosphorus uptake and selectively stunt existing *Poa annua* as well as seedlings. We also know that Betasan, Balan and Bandane, among others, can prevent *Poa annua* seedlings from becoming established. Each chemical has its good and bad points; each will do certain things and permit the turf manager to do certain things.

The turf manager should select a chemical for use in a *repeated* program to provide him with *continued* control. Technology is understanding the inner-relationships of weed repression and forced growth—if desired—and the principles one must follow to benefit from the selective program. Forcing growth with fertilizer, protecting existing grass with fungicides, overseeding when thinness is evident—these are all part of technology.

Tools

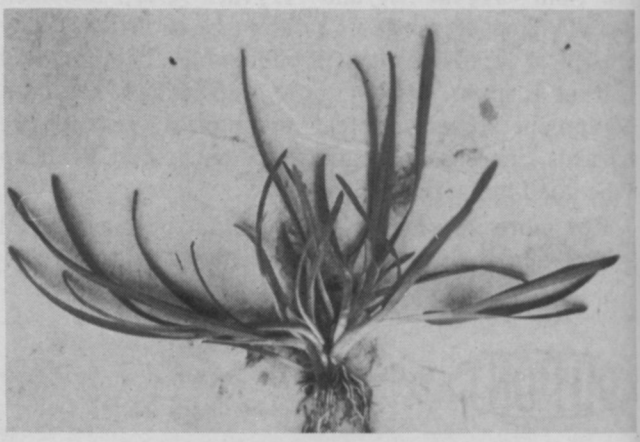
The new Rogers Aero-blade seeder combination was recommended to five out of six golf courses considering *Poa annua* renovation because it does a uniform job of placing seed in the preferred position for germination and survival.

There are combinations of tools that may be available for spreading materials, for applying seed and reducing thatch and for applying water. Upgrading to automatic irrigation and purchasing of needed equipment are just preliminary steps providing tools for improvement.

Techniques

Techniques vary widely depending upon tools and terrain. Basically techniques are related to habits. I have seen golf courses start at the edge of the fairways, overlap in the middle with arsenicals just like they were mowing. They crowded together between the sand trap, spread apart in the wide spots, and then two years later you can see where the man did or did not go twice. I have seen where sprayers slowed down and killed everything, where equipment going downhill went fast and uphill slow so that extreme differences in results were achieved. Even calibration, simple as it is, can be overlooked.

With repeated accumulations, records are important. If we miss out on how much has been applied, uncertainty prevails. For example, we strongly recommend that no soluble phosphorus be used when arsenic is being



Young immature **Poa Annua** plant is typical of those found in turf areas.

accumulated in *Poa annua* reduction. With this in mind it takes understanding of technology and different techniques of purchasing. If one does change his program and uses some soluble phosphorus, then arsenic, who knows where he is? In contrast, if only arsenic is used, then one seeing results can interpret the end results and know where he is.

Timing

Timing is always important, whether it be fighting the bull in the arena or working to get the most from nature's normal responses. When shall the program start? Early fall is preferred. When shall it achieve toxicity? One year later. When shall I put on seed? When there are openings. When shall I put on arsenic? When stress of climate is medium. How soon may I repeat overseeding? Every two weeks. How often may I apply arsenic? After next rain or irrigation. How much shall I apply? All of these are related, thus it is very wise to have samples, models.

Take trips and see other areas previously treated. And, as mentioned earlier, it is strongly suggested that timing be concentrated into one fairway, three fairways, or nine fairways. Don't start on eighteen fairways. Set some timing fast and some slow. Treating half fairways is simplest and safest during initial programs for the "best" half can be used. All clubs I know of that started a program later enlarged the control program. (At Brae Burn, Art Anderson used lead arsenate in 1938, '40, '44, '47, '51, '55, '59 and '64 to maintain his program.)

The Bluegrass Cycle

You understand a bluegrass seed. It will germinate in 6 to 18 days, puts up one leaf, starts a crown, puts up a second and third leaf. As it starts its fourth leaf it also starts a tiller at the crown, then a second tiller. Now it has some 8 or 9 leaves, and it is at least two months old—still a seedling. Then it puts out underground rhizomes, a horizontal stem that, as it emerges, causes spread characteristic of bluegrass. Now it is a "teenager." A bluegrass planted August 1 with irrigation could have rhizomes in November, but a seedling dropped carelessly in October may be useless and dried by desiccation in the winter so there is nothing next spring. Meanwhile, *Poa annua,* which grows more normally and vigorously, completely overmasks it.

For example, at Meridian Hills Country Club in Indianapolis overseedings made in two successive falls produced a very sparse bluegrass cover of less than 5%. When arsenics kept out the *Poa annua* and crabgrass, the less than 5% advanced to over 95% in one season.

The purpose of overseeding is to initiate sparse starting plants which, by spread, can fill in. Bentgrass grows similarly, making stolons. Bentgrass plants two to three months old are still very small. Actually, where arsenics are being used, at least 90% of the turf increase is from spread of existing plants. For high budget courses, plugging of thin areas is a real possibility in critical spots.

Arsenic Toxicity

Toxicity with arsenic can be summarized by the following steps:

(1) Stop applying soluble phosphorus;

(2) Improve poor drainage areas with vertical trenching;

(3) Gradually build arsenic toxicity by repeat divided applications;

(4) Repeatedly introduce the desired by overseeding and plugging;

(5) Resod the worst first (for example, fronts of tees and aprons); and,

(6) Cloudy days, short days, wet soils and time favor selective *Poa annua* weakening.