

Poa Annua -- It Won't Go Away!

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WONDER HOW MANY of you want to raise *Poa annua* and how many want to get rid of it. After years of experience with *Poa annua*, I believe it is safe to say it will never go away. You can ignore it or tend to it, but the fact of the matter is that it will probably come on stronger until one day during stress, it will leave temporarily. It will come back, but not before a golf course superintendent has been fired and an agronomist and pathologist have been reminded of their low level of breeding and high level of ignorance.

Why can't we prevent *Poa annua* from becoming dormant? We know a lot of the good and bad things about *Poa annua*; it's not the most comfortable thing to live with, but it sure beats having no grass at all. I've never found that *Poa annua* is as good as good-quality bentgrass for greens — only if you have that very fine type that doesn't have seedheads, you have 100 per cent of it and you can keep it. Several golf courses in the Northwest, some of the oldest in the country, after many years of natural selection probably have the finest type of

Poa annua anywhere. Their greens are beautiful when they are good, and when they are not perfect, well, then they are *Poa annua* greens. *Poa annua* is a grass that has a great range and is adapted all the way to the tropical areas. It is possible that we have several hundred or even several thousand genetic types; over 55 or 60 types have been identified. The really crushing problem is to have many of these types in one putting green and have to manage for them all.

Some golf course superintendents encourage *Poa annua* growth, and they have been able to capitalize on some of the environmental factors which favor its growth.

From a playability standpoint, one of our greatest concerns is when *Poa annua* begins to set seed. It is not unusual for heavy seed production to take place for a period of up to 45 days in the spring. This is considerably more than any bentgrass or other desirable turfgrass. *Poa annua* will set seed all the way down to heights of 1/8 inch, and there is always some seed in the soil. It is certainly

Vehicle traffic down the same path encourages Poa annua to take over. A severe winter causes the Poa to die out.



very prolific and germinates well, although it will not germinate during stress periods. It will only germinate when conditions are proper, when the weather cools and good soil moisture is available. It is a real headache when you are trying to establish new turfgrass areas, especially when you are dealing with Kentucky bluegrasses. Annual bluegrass is already producing seed when the Kentucky bluegrass is in the four-leaf stage.

COMPACTION

Compaction is one of the greatest problems in any kind of turfgrass growth, and over-irrigation and excessive rainfall contribute to the problem significantly. Of course there is little that can be done between October 1 and May 1 when we receive more heavy rainfall in the western part of the country, but over-irrigation can be corrected. Compaction is a serious problem. Roots cannot penetrate the soil, therefore oxygen relationships are poor and rooting will occur only near the surface. Under these circumstances we are inducing proneness to drought. You have to remember also that under these conditions *Poa annua* doesn't become dense enough to stand up to the stress it receives. It certainly won't hold up as well under stress as will Kentucky bluegrass, the fescues, bents, or a heavy stand of ryegrass.

Poor drainage is another particularly critical point. It's one thing to have excessive rainfall, but quite another to allow poor drainage to persist year after year. Sometimes drainage problems can be corrected by constructing open slit trenches with stone filled to the top. Be sure that you don't make these trenches too wide and don't use a coarse gravel that will interfere with mowing. Another approach to providing good drainage is through soil modification. I have seen cases where these surface trench drains were placed three feet apart and it was still mushy and soft between them. In this case we had better look at the soil characteristics and repair the soil under heavy aerating and topdressing programs using stable materials.

When heavy traffic, poor drainage and excessive rainfall or irrigation are put together, we really have a problem. The water stable aggregates are destroyed, it becomes one unidentifiable mass of soil particles, and drainage becomes impossible. Some good studies have shown that a soil compacted in a relatively dry state will take water at perhaps 1/2 inch an hour, whereas the same soil compacted when wet will permit water infiltration at a rate of about 1/100th of an inch per hour. This is exactly what is facing us in our traffic areas, and I guarantee that the ultimate grass in these cases is *Poa annua*. You can observe this for yourself on any golf course where these conditions persist.

Proper construction of tees and greens would eliminate many of the problems we have been talking about. If tees and greens were built with essentially a good sandy profile and an appropriate drainage system, there would be very little soil compaction in a wet state. Another important management consideration on these turfgrass areas concerns the fate of the organic matter which



Poa annua is a real problem when new turfgrass areas are becoming established. It is already producing seed before the other grasses are ready to be mowed for the first time.

we are constantly punching into the surface of these soils. The organic matter will represent the very fine material in the soil profile and will take on the characteristics of silt and clay in a normal soil. Thus it is our responsibility to see that an excessive amount of organic matter (thatch) does not build up on the surface or we will eventually have less internal drainage, even over sand. A regular program of aeration and topdressing will help guard against this problem.

One of the greatest contributing factors to *Poa annua* encroachment and development is the failure to control turfgrass diseases. This doesn't always mean that the superintendent hasn't done his job. Sometimes you just can't treat it. Some superintendents in the North are faced each year with snow mold, and because of snowfall or ice, there is little they can do about it. In the Northwest we have *Fusarium* problems, particularly in the more moist areas. When it rains every day, it is very difficult to apply fungicides in an effective manner. *Fusarium nivale*, sometimes called *Fusarium* patch, often occurs at this time. You can practically chart the invasion of annual bluegrass in the putting green or other turfgrass area by observing outbreaks of *Fusarium*. *Ophiobolus* patch disease is another real problem in the Northwest and there is no known type of control program for it. The only control we have presently is a nutritional program using sulfur, or more intensive programs using other materials containing sulfur. With regard to *Ophiobolus*, we have identified hundreds of rings in cemeteries, parks, golf course fairways and other areas where *Poa annua* encroached because this disease killed the permanent turfgrasses.

Another superintendent was told that the Green Committee would like 100 per cent green

grass and no brown spots on the golf course. This resulted in over-irrigation and conversion of the fairways from Kentucky bluegrass to bentgrass and *Poa annua*, both of which are extremely susceptible to kill by gray snow mold or *Typhula incarnata*.

The committee and some of the trustees wanted to know what they could do about this. I told them that they could renovate the fairways and replant, but they still insisted on over-irrigation to keep the course green. Though the repercussions of their decision were explained thoroughly, it didn't seem to change their minds. In this case there is just not much you can do.

Aeration and vertical mowing also encourage *Poa annua*. If we use these practices during the time when we can expect heavy germination, there is no doubt that you will increase the *Poa annua* stand. This has been proven many times by researchers across the country. To take best advantage of these programs, do them during the period of time when they are least advantageous to the annual bluegrass.

Another problem is the misuse of maintenance equipment, golf carts and other vehicles during inclement weather. Heavy foot traffic at the inappropriate time can be just as damaging. In one case several greens were badly damaged during the frosty periods in December and January in the Northwest. Though some grass was lost, the superintendent said it served a very good purpose in the end: it really impressed upon the membership that they shouldn't play golf when the course is in that condition. Under these circumstances, ice crystals are formed within the cells. As a result of traffic across the turf, the plant cells are ruptured and the grass plant eventually dies. This opens up new avenues for *Poa annua* to move in. Perhaps the most damaging time is when the surface inch or two has thawed and there is still an ice layer or frozen soil beneath. These surface soils are supersaturated and we are literally wiping out our desirable grasses, to say nothing of the damage we are doing to the putting surface.

Shade, too, promotes annual bluegrass growth. The surest way to encourage a *Poa annua* stand is to give it some shade. I don't believe that there should be a tree that is going to block a lot of light within 60 feet of a putting green. If the trees are closer than this you are robbing greens of some light. Use a light meter to measure the light in sunny and shady areas and see the difference for yourself. We have seen many golf course greens that receive less than threshold levels of light for the growth of bentgrass. In its place we have stands of *Poa annua*; but believe me, they are not good stands. I think golf course architects should pay particular attention to this and Green Committees and golf course superintendents need to develop a healthy respect for this problem.

SUGGESTIONS FOR DEALING WITH POA ANNUA

Some control programs, however, may help you live with the problem of *Poa annua*.

I recommend overseeding. However, the broadcast method of overseeding usually does not lead to a significant improvement in the turf-grass stand, even over a period of many years. You need specialized overseeding equipment for this job, and if it is used correctly, there is hope for some success. If we are going to have more success with overseeding greens, however, I believe that they should be taken out of play for a few weeks after the operation so that the grasses will have an opportunity to germinate and develop. I don't think you can plant bentgrass and mow it at 3/16 inch on the first cut and expect it to survive. That is exactly what we are doing now. Except for those few seeds that germinate in the aerifier holes and as a result are tall enough to withstand the first cut.

Looking at soils very briefly, I think the USGA has done a beautiful job in research and in developing publications that promote proper construction techniques for greens. I also believe that the researchers at the University of California at Davis have done well with their investigations with regard to frequent, light topdressing programs. These techniques might well be worth study by golf courses that have wet, unstable greens. Certainly providing good soil mixtures which provide good drainage is significant to growing desirable turf-grasses.

Just because *Poa annua* moves in on poorly drained sites and those that have been subjected to heavy traffic doesn't mean that this is the best and only condition for it to grow. *Poa annua* does much better under well-drained conditions with good levels of fertility and all the other good practices and conditions that help bentgrasses and bermudagrasses thrive. But let's do a better job of soil mixing. We know a lot more about it now and there is information at your fingertips. There is little or no excuse for doing a sloppy job of construction now.

Let me emphasize again that good disease control is very important. We have some good fungicides, but many more are needed. A couple of new fungicides are doing well for us, and I think they will become available soon. The fungicide by itself is just part of the program. Don't wait for a disease epidemic before you apply the material. If you know the conditions under which diseases attack, taking into account temperature, humidity, day length, etc., then be ready to apply the fungicide.

I should mention vigor in grasses. Dr. Gould and I have been working with about 156 cultivar selections and varieties for six or seven years, a project that has been partially supported by the USGA Green Section. We are selecting for *Fusarium* resistance and for other economic characteristics, such as color. I am one who likes color. I don't believe that color is everything, but if I have two varieties that both show many good characteristics, the one that has good color will get a higher rating every time. The point of our program is to develop vigorous and disease-resistant bentgrasses that provide high quality playing characteristics and compete well against *Poa annua*. Unfortunately, none of these 156 types from

After disease weakens turf, *Poa annua* will surely encroach.



Poland, Russia, Sweden, Norway, Holland, etc., have total *Fusarium* resistance; therefore, it looks as though we will always be dependent upon fungicides and cultural programs to a certain degree.

I would also like to mention pre-emergence control programs, which I have been working on since about 1959. About three years ago one of our staff members took on the responsibility of coordinating all the *Poa annua* work that we have done thus far and suggesting new programs that seem promising. The program that he came up with is looking excellent in the Northwest, although I have to qualify this by saying that it may not work everywhere. It involves using endothal and DSMA. It has been successful in removing annual bluegrass from stands of bentgrass, Kentucky bluegrass and ryegrass.

This is a post-emergent application, and it is essential that we use pre-emergence herbicides in advance of the application of endothal. I believe that our program can be further modified so that we can apply the endothal and then overseed without pre-emergence herbicides. The endothal can be reapplied later, and a pre-emergence herbicide can be used to stop further germination. Our program has been tried by some of the researchers in the East, but they haven't had the success with it that we have. Maybe they need additional testing to find the time of season when the material is most effective. I cannot make a recommendation to you now because it would be contrary to EPA labelling, which suggests a rate that will not control annual bluegrass.

I would say eliminate shade; use a little bit of judgement when planting new trees. I believe in a dynamic tree program around greens and tees. Some years after a tree is planted, plant another one near it. When the original tree gets to a point where it is creating problems, cut it down and let the other one come into its place. This type of continuing program should prevent shade problems.

Another important aspect of *Poa annua* control involves nutritional programs. If you are dealing

with *Poa annua*, it certainly does respond very well to high levels of nutrition. Bentgrasses in our area respond to medium to high levels. High rates of nitrogen, especially from urea sources, will stimulate more disease activity than will any other source of nitrogen, so be prepared to go to a better fungicide program. If you want to go with lower nitrogen levels, you are taking a risk that turfgrass density will not be adequate for the best playing conditions. So you have to decide in your own areas how much nitrogen is enough to get the density that you desire. If you can do it on one pound of nitrogen per 1,000 square feet, be my guest! If we can't do it on less than eight or 10 pounds, that's what we will use.

Sulfur is another important nutritional component. We have observed some excellent responses by using up to 3½ pounds of sulfur per 1,000 square feet per year. In addition to significantly reducing *Fusarium* patch disease and eliminating *Ophiobolus* patch disease, we have almost completely eliminated annual bluegrass after five years or so of continued sulfur applications. This program also involves keeping phosphorus and potassium levels adjusted. If high levels of phosphorus are maintained, you are stimulating *Poa annua*. If you want to increase or make your *Poa annua* stands better, use higher levels of phosphorus, moving it up to perhaps ten parts per million as indicated by a soil test. Otherwise, keep the phosphorus level between three and seven parts per million. Even when high rates of sulfur were used, high phosphorus levels encouraged *Poa annua* growth and seedhead production. However, if *Poa annua* is what you are managing, I would recommend that you use no more than 50 pounds of sulfur per acre per year because if you go any higher, the *Poa annua* will be retarded and more problems will be created.

It is probably safe to say that annual bluegrass will never go away any more so than the common cold.