

CULTURAL PRACTICES TO DISCOURAGE POA IN KENTUCKY BLUEGRASS

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How can two neighboring turfs, both of Kentucky bluegrass, contain such different amounts of *Poa*? You've probably read a list of the sins that result in *Poa*: overwatering, compaction, traffic wear, divots, etc., etc. It's common knowledge that these evils will open established turfs to *Poa*.

But have you ever noticed that some stands seem to contain *Poa* right from the start? It's as if the *Poa* came up at planting time. Although a great deal is known about *Poa* invasion of established turf, the problems of *Poa* in the seedbed are unsolved.

Recent studies at Penn State have confronted this dilemma. We've discovered several ways to limit the amount of *Poa* that comes up with a stand. I'm not talking about herbicides or seedbed treatments, but cultural methods that you can use to cut down on *Poa* when you plant.

Cultural methods

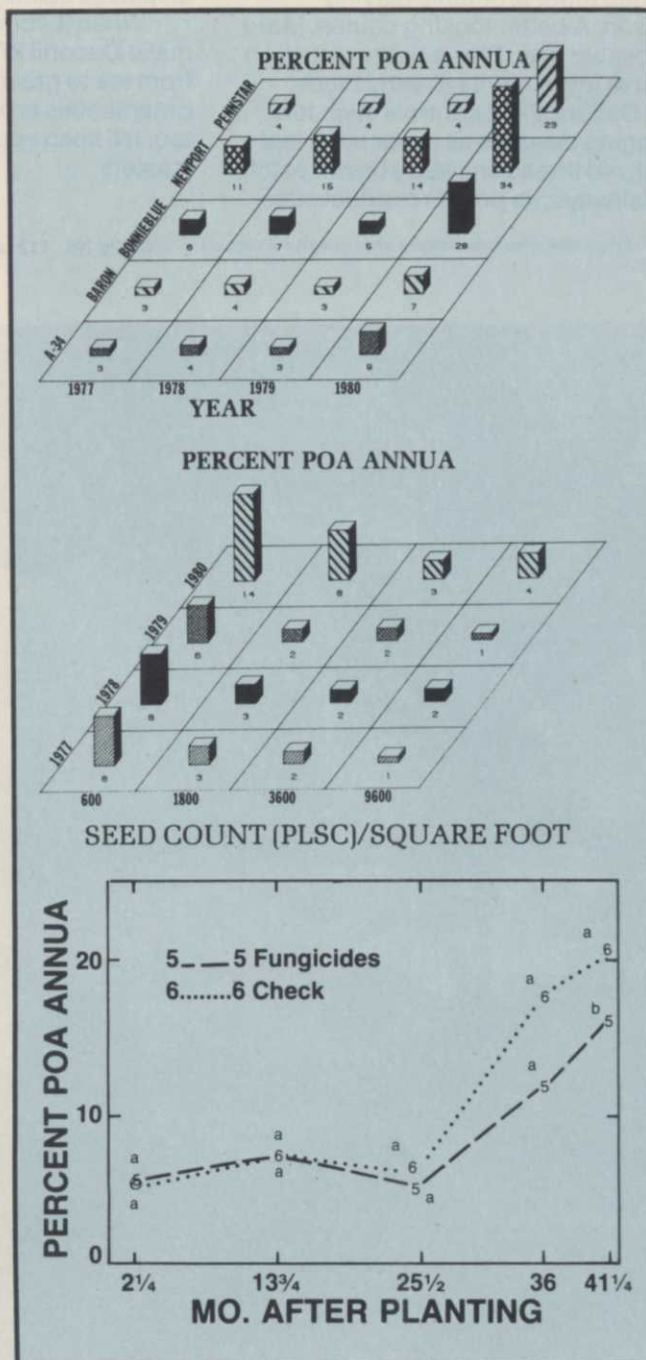
You've probably heard turf managers say, "Raise your cutting height; that'll cut down on your *Poa*." It's been known for years that Kentucky bluegrass fights *Poa* best at higher cutting heights.

We found twice as much *Poa* at 1/2" than at a 1" height. But the remarkable thing was that only a few weeks of close mowing were needed to let in the *Poa*. A two-month-old Newport stand, with only a month of mowing under its belt, had 88% more *Poa* at 1/2" than at 1".

Let's say you're planting a Kentucky bluegrass lawn in an area where *Poa* is a problem. And let's say that you want to mow it at 1". How can you best manage the mowing to limit *Poa*?

First, begin mowing as soon as the grass reaches 1 1/2"; use a 1 1/2" setting on the mower. Then, keep it at that height for about a month. Take an additional month to lower the height, a little bit each time you mow. This will give the desired grass a chance to establish itself. Remember, if you mow Kentucky bluegrass lower than an inch, you're asking for *Poa*.

One of the most important decisions you'll make in planning your new turf area is the cultivar (variety). In our study we tested five popular cultivars to see which ones limited *Poa* invasion. Newport, a less vigorous bluegrass, allowed a large invasion of *Poa* during the first few months after planting. It also kept that



portion of *Poa* for more than three years. A-34 (BenSun) and Baron, on the other hand, prevented *Poa* in the first few months and never did let much in. A vigorous cultivar will not only look good, but it will also work to keep *Poa* out.

So, you've decided on your cutting height and cultivar. The next question is: How much seed to use? Textbooks tell you to seed bluegrass at

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Poa vs Kentucky from page 36

1-2 lbs. per 1000 square feet. But is this the right rate for keeping *Poa* out?

To answer this question, we established several plots with seeding rates of 600, 1800, 3600, and 9600 pure-live-seed count (PLSC) per square foot. With the PLSC method, we knew how many viable seeds we were planting per square foot of soil. These rates spanned a range from roughly 1/2 to 10 lbs. of seed per 1000 ft².

The results were surprising. Seeding rate affected the amount of *Poa* for more than three years after planting. Low seeding rates (1 lb. and less) let *Poa* invade during the early months of growth, before Kentucky bluegrass could take hold. After the damage was done, the *Poa* spread. *Poa* seldom relinquishes what it gains.

Vigorous cultivars seem more immune to *Poa* invasion than their weaker cousins, especially at low seeding rates. If they can put up a good struggle against *Poa* in the first few months, they've got it made. Weak cultivars tend to lose the benefit of higher seeding rates as time goes by.

Very high seeding rates (above 4 lbs.) can predispose turf to seedling damping-off diseases. Heavy rates only feed the fungi. Once damping-off hits, you're back to the same problem: A stand full of holes where *Poa* can invade.

We were lucky; damping-off wasn't a problem in our test. You might not be so lucky.

What's a good Kentucky bluegrass seeding rate? 2-4000 PLSC/ft² (see accompanying explanation of the PLSC method).

How do fungicides affect *Poa* invasion?

At the beginning of our experiment, we had equal *Poa* in each of two plot areas. We sprayed one area with fungicides, leaving the other area untreated. We made 5 to 9 applications per year of common turf fungicides in a disease-prevention effort.

Fungicides had a cumulative effect, holding back the amount of *Poa* that invaded the treated area. Maybe the fungicides had some beneficial

effect on the Kentucky bluegrass or perhaps a detrimental effect on the *Poa*. In any event, 3 1/2 years later, there was less *Poa* where fungicides were used.

Of course, fungicides shouldn't be used as a *Poa* control. It would cost you thousands of dollars for only 5% less *Poa*. But if you are using fungicides for disease control, less *Poa* is a side benefit.

Why Poa wins

Poa is botanically a sister of Kentucky bluegrass. The plants look similar. The seeds are about the same size. But if a few *Poa* plants get into bluegrass turf, they take over. This is especially true when the stand is young.

We tried to find some answers by seeding *Poa* and Kentucky bluegrass side-by-side and watching their progress. *Poa* seedlings broke ground two full days before Kentucky bluegrass. Ultimately, 90% of the *Poa* seeds produced seedlings, compared to only 45% of the Kentucky bluegrass, even though lab germination of the two was nearly the same.

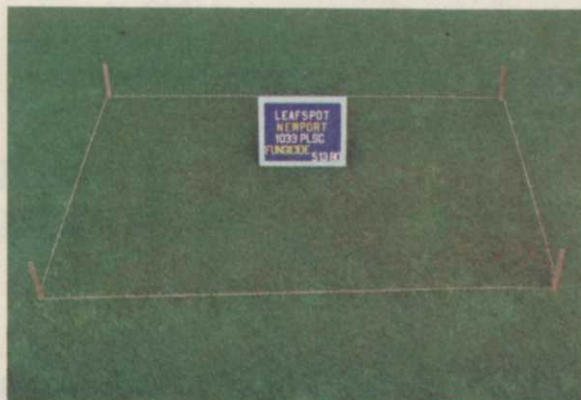
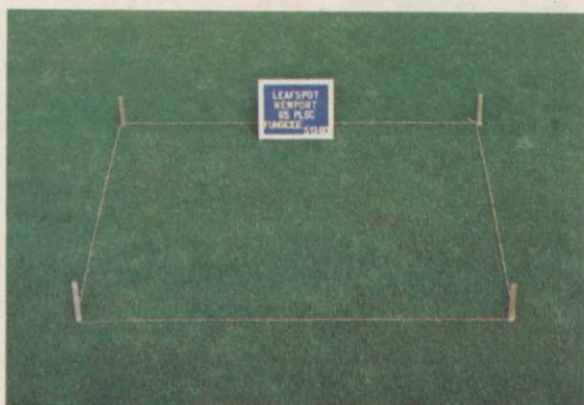
In another experiment, we seeded a mixture of *Poa* and Kentucky bluegrass. Neither grass bothered the other during germination. The takeover by *Poa* came during the month after germination. *Poa* produced twice as many tillers as Kentucky bluegrass and four times as much leaf dry-weight from an equal number of seedlings.

Summary

Poa is a grass that never passes up the opportunity to get involved. In established turf, mistakes in management and wear and tear give *Poa* the chance it needs to get a foothold.

Poa can also be a problem in seedling stands, germinating with the desired grass and later taking it over. Cultural methods can be helpful in limiting *Poa* in a young stand.

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Newport Kentucky bluegrass shows the effect of seeding rate on *Poa annua* after three years. Photo on left shows seeding rate of 600 pure-live-seed-count per square foot. Photo on right shows rate of 9600 PLSC/sq. ft.

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Seed quality is important, no matter what size area you're planting. If you're undertaking several acres, minor differences in seed quality can add up to major savings.

Many things go into good seed quality: purity, freedom from weed seed, germination percentage, and the number of seeds per lb. You can find that information on your seed label or tab, with the exception of the number of seeds per lb.

Modern bluegrasses vary considerably from the 2.25-million seeds per lb. figure often quoted for Merion. In fact, depending on the cultivar, they can range from 850,000 to 2,000,000 seeds per lb. — a 2X difference! That translates to a possible 2X savings on the cost of seed.

In the PLSC method, first enter the desired PLSC/ft² rate; a value of 2-4000 PLSC/ft² will work nicely. Next, multiply by the number of square feet to be seeded. Divide by the number of seeds per lb. (see list below). Divide by the purity listed on the tag (if the purity is 95%, enter 0.95). Divide by the germination listed on the tag (as a decimal again). Hit the = and you get the lbs. of seed needed to plant your area.

Here's an example. Say you want to plant a 10,000 ft² lawn to a 50-50 blend of Merion and Birka. And you want to seed at 4000 PLSC/ft². That means you'll need 2000 PLSC/ft² of each cultivar.

The seed tag on your Merion lists 99% purity and 92% germination. Your Birka has 95% purity and 80% germination. Thus, because of different seed qualities, you'll need quite different amounts of seed for a 50-50 blend: Merion 11 lbs., and Birka 31 lbs.

The following are seed numbers of several popular bluegrasses, from studies at Ohio State and Penn State:

Cultivar	Seeds per lb.
A-34 (BenSun)	1,500,000
Adelphi	1,300,000
Baron	1,100,000
Birka	850,000
Bonnieblue	1,100,000
Brunswick	1,600,000
Cheri	1,100,000
Delta	1,400,000
Fylking	950,000
Galaxy	1,100,000
Glade	1,200,000
Majestic	1,200,000
Merion	2,000,000
Newport	1,200,000
Nugget	950,000
Parade	1,200,000
Park	1,200,000
Pennstar	930,000
Touchdown	1,300,000
Vantage	1,500,000
Victoria	1,000,000