Research Newsflash

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Turfgrass Producers (TPI) Select Brede as "Innovator of the Year"

Warren Bell (left), past TPI president, presents Doug Brede with the "Innovator of the Year" cup. This was the first time in TPI's history that the award went to a turf breeder.

Doug Brede, Jacklin Seed's Research Director, was presented the "Innovator of the Year" award by the Turfgrass Producers International at their recent winter meetings in Orlando.

The "Innovator of the Year" Award is given to an individual who has made unique and significant achievements that advance turfgrass sod production through research, engineering, training, marketing, public relations or environmental improvements, etc. An awards committee determines the annual recipient, based on nominations from the membership.

Warren Bell of Biograss in Sandy, UT, read passages in his introduction speech to the presentation from personal letters from turfgrass sod growers nominating Brede. They cited Brede's emphasis on turf sod production research. Since 1993, he has planted and evaluated over 48,000 individual grass plots on sod farms in Ohio, Maryland, New Jersey, Illinois, and California.

TPI is a worldwide association committed to the advancement of the turfgrass sod industry. It was formed in 1967 as the American Sod Producers Association by a group of Midwest (US) sod farmers. TPI's membership now exceeds 1100 and is comprised of growers from over 40 countries around the world.

Brede is a Fellow in the American Society of Agronomy and Crop Science Society of America. A Fellow is the highest award bestowed by these scientific societies. He is also the recipient of the Genetics and Plant Breeding Award for Industry from the National Council of Commercial Plant Breeders, and the Fred V. Grau Turfgrass Science Award, for lifetime achievement in the advancement in turfgrass science.

Seeding Rate of Grasses

by Doug Brede, Ph.D.

In years like this, with reduced seed supply and slowly rising prices, many people take a second look at the seeding rate of their new turf as a way of trimming the budget. Seeding rates are those figures listed in turf textbooks that tell you how many pounds of seed to plant per area of lawn.

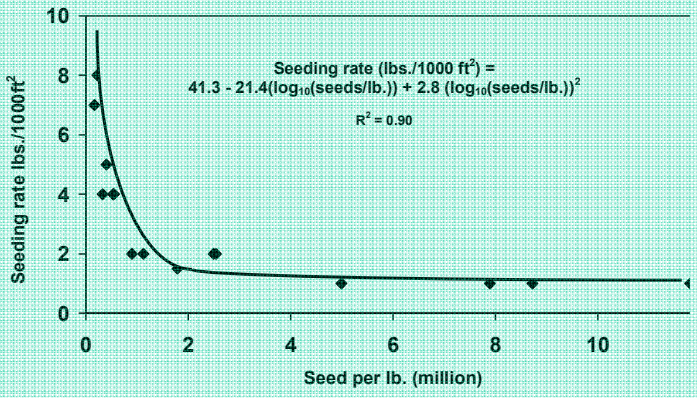
For example, a typical seeding rate for bermudagrass might be 1 to 3 lbs. per 1000 ft^2 (or in metric, 5 to 15 g/m^2). These figures have been developed over the years by seat-of-the-pants observations by turf practitioners. Here's how they might be determined: Let's say I planted a bermudagrass lawn at a 2 pound seeding rate and it produced a nice looking turf. That figure would be recorded and over time would become the industry standard for others to use.

Most seeding rates are expressed as a range rather than a single number. This allows for flexibility to accomplish goals such as speed of establishment and minimal weeds and disease.

A natural consequence of seeding rate is shoot density. If you sow twice as many seeds per square foot, you'll end up with about twice as many shoots.

Seeding rate also has some less obvious effects. As density increases, shoots become smaller, *cont., p. 2*

Recommended turfgrass seeding rates can be approximated based on the number of seeds per pound a grass possesses. The graph below is from Chapter 7 of *Turfgrass Maintenance Reduction Handbook*. It was derived by plotting the number of seeds/lb. versus the recommended seeding rate of popular turfgrass species. A statistical regression analysis known as "best fit" was used to fit a line to the data, accounting for 90% of the variation in the relationship.



Jacklin's Research Department Welcomes Tonya Lyden

Tonya Lyden is a new Jacklin employee, starting the first of the year. Lyden's responsibilities include plot preparation, employee supervision, harvest, and field and laboratory data collection under the direction of Dr. Brede.

Lyden graduated with a B.S. in Environmental Science from the Univ. of Idaho in 2004. She worked for the Bureau of Land Management (BLM) in the noxious weed control program while finishing school. After graduating she continued working at BLM developing a hands-on knowledge of pesticide applications, biological control efforts and monitoring projects.

Prior to BLM she worked for Ecosystem Management and Rehab where she operated heavy equipment building, maintaining, and decommissioning forest roads. Lyden comes to Jacklin Seed with a diverse work and educational background.

Seeding rate, continued

root systems shorter, and leaves and plants more crushed into a tighter space. Leaves from one shoot shade and overlap others and compete with them for sunlight.

Parasitic fungi have a field day in overly dense grass stands. Fungi jump from plant to plant via overlapping leaves. And research has shown that density differences can persist for four or more years until a stand equilibrates. Diseases are rare in thinner stands.

But abnormally low seeding rates are not the answer either. Grass that's seeded below its optimal range can suffer weed invasion. It's often said that the best deterrent to weeds is a dense, vigorous stand of grass. Thin open areas in the canopy from low seeding rates allow opportunistic weeds to get a beachhead. A good way to look at recommended seeding rates is that they are a compromise between weeds and diseases.

Turfgrasses differ in their seed size. A pound of turfgrass seed may contain from 200,000 seeds for tall fescue to 10,000,000 seeds for bentgrass. Even varieties of the same species may differ considerably in seed size. For example, **BlueChip** Kentucky bluegrass typically contains 945,000 seeds per lb. while **Limousine** has 1,500,000.

Theoretically, a variety with twice as many seeds per lb. could be planted at *half* the seeding rate and still provide the desired number of seedlings per square foot. Unfortunately, there is not a one-to-one correspondence between seed count and seeding rate, as the graph on page 1 illustrates. To make this graph, I plotted all the major cool and warm-season grasses along with their recommended textbook seeding rate. The relationship between the two was not a straight line but a logarithmic curve. Above 1 million seeds per lb. the curve is flat, indicating that a 1 or 2 lb. seeding rate works well for all. Below 1 million seeds and the curve rises sharply. In practical terms, here's what this means:

- Larger seeded grasses have more *endosperm* — the stored food grasses use for germination.
- Large seeded grasses can germinate from a greater depth — many small seeded grasses like zoysia cannot be covered with soil at all or they may fail to sprout.
- Large seeded grasses germinate in 5-10 days (for the most part); small seeded grasses require 10-21 days to sprout.
- Large seeded grasses have a higher field survival rate than small seeded grasses. Typically 75% of perennial ryegrass seeds will produce a viable sprout, while only 45% of Kentucky bluegrass seeds will. This fact is compensated for in the recommended seeding rate.
- Large seeded grasses need to be planted at higher seeding rates than small seeded grasses to produce the same shoot density.
- When you mix a large seeded grass with a small seeded grass, you should plant the mixture at the rate recommended for the grass in the greatest proportion. For example, an 80% fescue — 20% bluegrass mix should be planted at the fescue seeding rate, not the bluegrass rate.
- Seed sizes can vary from year to year and from one seedlot to another by as much as 20%, due to seed growing conditions and harvest.

Damping-off diseases are produced spontaneously in plots planted at 5 (left) and 10 times the normal seeding rate for Kentucky bluegrass.

In conclusion, it's rather pointless to try to capitalize on seed count differences among varieties to reduce seeding rate. Lower field survival and endosperm in smaller seeded grasses tend to nullify any possible advantages.

This old photograph shows Kentucky bluegrass varieties differing from 2,000,000 seed per lb. for Merion (left) to 850,000 seed per lb. for Birka.

My advice is to stick with the time-tested recommended seeding rates (e.g., 2 to 3 lbs. for bluegrass) — regardless of the variety.