Disease Resistance Matters

Source: www.TurfMagazine.com

Incorporating disease-resistant cultivars into the lawns of your client's accounts is one of the management strategies that just makes sense.

A businessman might counter this by saying, "Wait a minute, by incorporating disease resistance into the clients' lawns, we're preventing ourselves from making big cash on fungicide spray programs." Because a lawn care company (each and every one) is judged by the health and appearance of the turfgrass under its care, that's obviously not the case. A company risks losing a client and the ongoing revenue that client represents if it doesn't consistently deliver the results – and at a price acceptable to the client.

Beyond that, fungicide spray programs are not always 100 percent effective, few clients want to pay for costly treatments, and applicators risk making unnecessary or inappropriate applications, especially if they're not familiar with properly diagnosing turfgrass diseases.

Leaf spot is one of the diseases that some turf varieties are now able to resist. Photo: John Watkins, UNL

Resistance to what?

One of the very first pathogens that cultivars were chosen with regard to disease susceptibility is Bipolaris/Drechslera leaf spot. In fact, it was called Helminthosporium leaf spot at the time. The first few cultivars were a big improvement over Park and Merion Kentucky bluegrass cultivars, which were quite susceptible. It was not uncommon for entire lawns or campus grounds to be completely decimated from this disease. Turf geneticists working with plant pathologists perfected new turfgrass introductions with superior disease resistance, and many of the newest turfgrass cultivars on the market are considered highly resistant.

Rust is another troublesome turf disease. Several bluegrass and perennial

ryegrass cultivars are now highly resistant to common diseases such as crown, leaf and stem rust. While good cultural management is key to controlling this disease, cultivar selection can have a significant role. Both rust and leaf spot diseases are evaluated in the National Turfgrass Evaluation Program (NTEP).

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How resistance works

The genetics of turfgrass plants determine how they perform under conditions of heavy disease pressure, such as when the spores of a particular disease are being spread. Traditional methods of plant breeding involve crossing an individual plant with a desirable trait with another one with the same trait. The resulting offspring from the cross is a new plant that has been bolstered in its ability to resist a pathogen, possibly better than either of the two parents. Even though this process is tedious and time-consuming, most of the improved cultivars of vegetables, fruits, shrubs and turfgrasses have been created this way.

If the goal is to add new traits, new plants can also be created by interbreeding a cultivar that does not possess the trait with one that does. The offspring of this effort would then be evaluated to determine the level of trait incorporation; in this case, how well it resists or tolerates disease infection.

In addition to traditional crossing and interbreeding, genetic engineering allows breeders the opportunity to shorten the breeding process by taking genes directly out of one plant and dropping them into another without waiting for an offspring to grow. This is a developing area of research that utilizes high-tech devices such as gene guns to introduce the new DNA or specific DNA sections.

Utilization of genetic engineering methodology makes the most sense where high-value plants are involved and where little or no natural resistance exists among currently available cultivars. The payoff is potentially quite significant. Turf plants that are more resistant to virulent diseases would require fewer fungicide applications to maintain them, with obvious savings and environmental benefits.

Genetic resistance improvements have been made with many diseases, including rust. Photo: John C. Fech

Sources of information

So, how do you find out about the latest, greatest disease-resistant cultivars? There are three main sources: the National Turfgrass Evaluation Program (NTEP), seed industry representatives and land grant university turfgrass extension programs. NTEP can be described as a consortium of

participating universities and seed producers that evaluate the several hundred cultivars of the primary species of turfgrasses used in North America. Evaluators monitor the performance of literally thousands of turf plots under widely varying conditions at test sites across the United States and report their findings to NTEP, headquartered in Beltsville, Md. The tiny staff at Beltsville, under the guidance of Executive Director Kevin Morris, tablulates and posts trial results on NTEP's website. These test plots contain older established cultivars, newly released cultivars and experimental varieties, many of which will never make it to market.

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As you read through NTEP reports, it's easy to get lost in a sea of data, but you needn't let that happen. If you're looking for species and particular cultivars within that species that are resistant to disease, start by evaluating the results submitted from the nearest testing location, usually a nearby land grand university. Then go to the data that addresses disease resistance for the grasses in that location. The table you will find is essentially self-explanatory. The higher the rating of the cultivar, the more disease resistant – at least at that testing location and under those particular conditions. Note also, the LSD notation at the bottom of the data. LSD stands for "least significant difference." If the LSD is, say 0.05 and the difference of the ratings of the most disease-resistant cultivars fall within that – for instance the highest rated cultivar receives a 7.0 rating and the next several are rated 6.5 or higher – they are all essentially equal when it comes to disease resistance.

NTEP provides data for many locations in the United States, but not all. If your area is not listed on their website, contact the land grant university in your state. University turfgrass field days and turf conferences provide excellent opportunities to obtain localized cultivar performance data as well as a chance to view turfgrass plots and speak to researchers about trends and expectations for various entries.