

German scientists discovered the original strobilurin in 1977. Named strobilurin A initially, this fungal antibiotic was produced by the pine cone fungus *Strobilurus tenacellus*. It's believed this wood-rotting fungus and similar fungi produced strobilurin to help protect it from microbes present in the wood.

Over the years, researchers enhanced the natural strobilurin synthetically, leading to the class of fungicides known as strobilurins. Widely used in agriculture, it wasn't until 1997 when the first one, azoxystrobin, was registered for turf use. Since azoxystrobin, additional fungicides in this class have been released in the turfgrass market, including fluoxastrobin, pyraclostrobin, and trifloxystrobin.

Although these fungicides are commonly called strobilurins, they are more properly referred to as QoI fungicides. For those of you who may not be familiar with the QoI terminology, the Qo is part of the Q-cycle found in mitochondria respiration (cytochrome system where electron transport occurs. Qo is the binding site for ubiquinone, which acts as an electron acceptor in this process). These fungicides inhibit fungal respiration by attacking the site Qo in the cytochrome system of the mitochondria.

The QoI fungicides have a wide range of control against a number of turfgrass diseases. Although QoI fungicides have a similar mode of action, they differ in regard to the molecule itself, leaf absorption and transportation within the plant and diseases controlled. Due to the broad spectrum-control properties, high level of efficacy and the classification as reduced-risk pesticides, these fungicides have been well received and widely used by golf course superintendents. When applied correctly, they're extremely effective and an integral part of any fungicide program.

From a plant-health perspective, some of the QoI fungicides exhibit growth-enhancing effects separate from disease control (Vincelli, 2007). Although not as well-documented on turf, some of the effects include hormonal changes in the plant resulting in delayed

Strobilurins in the Spotlight

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senescence and, in some cases, exhibiting reduced water loss by the plant.

The QoI fungicides' mode of action, however, is highly specific. For this reason, the potential is high for fungal resistance to occur. With the upcoming disease season almost upon us, it's important to be aware of the potential for resistance and know that certain rules need to be followed when incorporating QoI fungicides into a disease control program. The guidelines for reducing the likelihood of resistance to QoI fungicides as outlined by the Fungicide Resistance Action Group (FRAC) are summarized below:

1) Use integrated pest management and cultural practices to reduce disease pressure. If disease pressure is low, fewer applications are required and a rate more closely associated with the minimum labeled fungicide rate is more likely to be used.

2) Limit the number of QoI fungicide applications to no more than one-third of the total number of fungicide applications per season. For turf, this is generally in the range of two to four applications per year.

3) Every application should be rotated with a different fungicide from a class where the resistance risk is low to medium.

4) Use premixtures or tank mixtures of QoI fungicides with a different mode of action group. Generally, the minimum labeled rates of each fungicide in the tank mix should be used.

5) Make preventive applications to keep disease pressure low.

There. That should answer any of your questions about strobilurins.

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