

Winter overseeding, the process where a cool season turfgrass species is seeded into a warm season turf prior to entering dormancy to provide a temporary turf cover, is a fascinating look at extreme plant competition and the ensuing winners and losers that influences a successful winter overseeding program.

The winter overseeding process begins in late summer or early to mid-fall on a warm season turf with seeding and subsequent germination of the cool season turfgrass species. Seedlings emerge at a density considerably higher than what would be expected when seeding to establish a more permanent turf due to the higher seeding rate associated with winter overseeding. As these seedlings grow and begin to develop the competitive juices among the seedlings begin to flow. As the battle begins to heat up, the rules of engagement or competition are laid out by the concept of density dependency.

Density dependence refers to increasing death rate as the population increases. We can see the impact of density dependency through the process of winter overseeding to spring transition. Starting with fall overseeding the seeds germinate and emerge. Upon emergence, the seedlings are like little islands unto themselves; there is little interaction with the adjacent seedlings (neighbors). As the seedlings grow they come into contact with their neighbors.

As the seedlings become more interactive with their neighbors, seedling development is arrested. In other words, the plants become overcrowded. In response to the crowding, plant development slows to the point where the plants remain in a juvenile state for an extended period of time. Interestingly, plants appear to have an internal sensing mechanism related to the quality of light that is absorbed that tells them how close their neighbors are. In response, plant growth and development slows.

The advantage to arrested development or juvenile state associated with the high density of plants allows for an overseeded turfgrass like perennial ryegrass to be mowed at a green's height of cut for the winter season. Mowing at such a

Plant vs. Plant: The Invisible War

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height would not be possible for permanently established perennial ryegrass turf.

Once established, the overseeded green does not remain constant. Death of weaker individual plants begins to occur as the stronger or fitter plants begin to develop. The development of the more fit plants at the expense of weaker ones is more obvious at moderately higher overseeding rates.

After fall overseeding, visually the turf appears to have high density and a fine texture. As the season progresses, the turf becomes coarser in texture and less dense yet still appears to be a uniform green color. Why? In the overseeded turf the more fit plants are developing and getting bigger, while weaker or less fit plants are disappearing.

A question often posed for spring transition is, it better to seed at a high or relatively low overseeding rate?

It depends on what type of transition you prefer. As mentioned, at high seeding rates growth is stunted and plants remain in a juvenile state longer compared to a relatively lower seeding rate. Juvenile plants are more susceptible to environmental stresses. So as temperatures warm in the spring combined with some potential moisture stress, the higher seeding rate will transition quicker than the lower seeding rate.

Additionally, the environmental conditions present during fall impacts seedling establishment. High populations of juvenile plants are susceptible to diseases. If the winter overseeding is done prior to the optimum time, environmental conditions may exist that enhance the likelihood of seedling diseases like pythium.

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