Understanding Winter Covers

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In recent years an assortment of synthetic winter covers has entered the marketplace. Because the covers are relatively new, questions regarding their use and performance have arisen. Often referred to as geotextiles, they come in different shapes, weights, colors and composition. Generally secured in late fall and removed the following spring, winter covers have been used primarily on "problem" putting greens to reduce winter desiccation damage and to promote earlier green-up and growth in the spring.

Because of the diverse properties of geotextiles, their use has extended around the golf course. For example, they can be found under cart paths for improved stabilization, on slopes to reduce erosion, in sand bunkers to prevent sand-soil mixing and around drain lines to reduce clogging. They are also used on newly seeded or damaged areas to hasten the rate of germination and regrowth. Finally, geotextiles that exclude light penetration have been used in landscape plantings to prevent weed invasion.

Winter Protection

Geotextiles used for winter protection have a direct influence on the turf environment below them. They play an important role in determining the light, temperature and air-moisture conditions at the soil surface. Because these factors are interrelated, it makes the cover's role a delicate one in maintaining a balance. For example, a winter cover that conserves valuable soil-plant moisture but excludes light or prevents the turf from "breathing" is of little to no value in most cases.

Turf under a cover requires the same conditioning as turf without a cover. It should, for example, be able to withstand fluctuating weather conditions (temperatures, etc.) without being damaged when the cover is removed. An effective winter cover should help modify the environment underneath to protect the turf and promote earlier, yet normal (not stemmy or elongated), growth in the spring.

Various winter covers have received favorable reports from around the country even though their material composition varies considerably. This is understandable. Turf really doesn't know whether it is being covered by a fabric made of a non-woven needle-punched polyester or a spun-bonded polypropylene.

What counts is the environment that is created underneath a cover. The effective covers generally have one thing in common: They possess a sufficient degree of permeability to air, light and water. This is not to say all covers will perform equally or effectively regardless of their composition. They don't. The key is to understand the properties of a particular cover and determine which performs the best in a given geographic area.

In northern New England, for example, snow generally covers the ground during the winter months, followed by erratic weather in early spring. Desiccation damage can certainly occur during open periods in winter. However, during an average winter the snow acts as a good insulator.

Most desiccation damage occurs shortly after the snowmelt period when the turf is fully exposed to drying winds. Winter covers in this climate need to provide protection during those open winter periods yet be permeable enough to remain secured over the turf for up to three weeks following snow-melt--until after extreme environmental fluctuations have passed. It is beneficial to have as much flexibility as possible on the removal time of a cover in the spring.

FIELD TESTS

Over the past few winters an assortment of synthetic covers has been tested under actual field use in New Hampshire. Secured over bentgrass turf in late fall, covers made of materials ranging from polyester to polypropylene, in colors from white to black and weighing from 0.6 to 8.0 oz./sq. yd. have been evaluated. Removal time of the cover in the spring has ranged from one to five weeks after snowmelt.

The most favorable results have come from covers that are permeable to air, water and light--allowing at least 50 percent light transmission. These covers generally weigh between 1.0 and 3.0 oz./sq. yd. Examples of covers that have these characteristics include fabrics made of woven polyethylene and spun-bonded polypropylene, polyester or nylon. The color of the fabric has made little difference in overall performance. However, cover weight and density have had more impact.

Although they produce better results than uncovered turf, very lightweight permeable covers tend to be less effective in shielding the turf from desiccation. However, covers can also be too dense. For example, a fabric made of polypropylene weighing 8.0 oz./sq. yd., although having good insulating properties, does not allow a sufficient amount of light to penetrate (5 percent or less). The turf below tends to be more smooth than protected.

Unless removed shortly after snow-melt (one to two weeks), the turf will become chlorotic and produce an undesirable stemmy and elongated growth habit. If such a cover is removed too early in the spring, the turf is more vulnerable to freezing temperatures and drying winds than uncovered turf.

REASONABLE EXPECTATIONS

Of course, weather conditions, the cover type used and the time at which measurements are taken will effect a cover's performance. However, based on field results in New Hampshire, here are some reasonable expectations when using an effective winter cover as compared to uncovered turf:

- Expect improved leaf moisture conservation in the leaf (15 percent to 30 percent) and in the soil (2 percent to 5 percent).
- During sunny days in April look for higher daytime (5 to 15°F) and nighttime (1 to° 4 F) surface temperatures under a cover. Expect little to no temperature differences in cloudy weather.
- Primarily because of the response of the elevated temperatures, expect spring green-up to be one to three weeks earlier, turf with deeper roots (1/2 to 1 inch) and 30 percent to 60 percent more top growth. Premature cover removal following snowmelt reduces the protection and growth benefits otherwise gained if it is left secured.
- Look for extended growth and color retention one to three weeks later in the late fall after securing a cover.
- When used as a germination cover for fall seedings, expect faster germination rates (30 percent to 50 percent) and improved winter survival of the young seedlings.