

New Mulch Technology For Turfgrass Establishment

Golf Courses Can Use Weed-Free Mulch Pellets For Seedling Establishment

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Mulching is commonly the last step in the turfgrass seeding process. Mulches aid seed establishment by retaining moisture, decreasing evaporation and minimizing soil temperature change. Some materials also reduce soil erosion (5).

Because agriculture produces an abundance of organic matter such as straw, farm fields have long been a major source of mulching materials. Increasingly, however, recycled paper is being used in mulches, even on golf courses, where clean, weed-free material is required.

Crop Residues

Straw mulch offers a significant moderation of soil temperature as well as soil moisture conservation (2). Researchers have noted reductions in soil evaporation with straw mulch applications (1,4).

Oat and barley straw (the plant stems that remain after grain harvest) are popular mulching materials in areas where these grains are grown. Salt marsh hay is another commonly used mulch, but wetland protections have increased its costs and reduced its availability.

Although these types of mulches provide good mulching effects, they can contain weed seeds and have an unsightly appearance. In one study, weed and small grain seedlings in straw treatments caused a reduction in turfgrass seedling weights compared with mulches not contaminated with seed (2). For these reasons, straw mulch use on golf courses is minimal.

Hydraulic Fiber Mulches

Hydraulic fiber mulches, made from virgin wood cellulose or recycled paper, are more commonly used in golf course seeding operations.

Hydraulic mulches are combined in a specialized applicator with water, seed and sometimes fertilizer. The slurry is then sprayed onto the prepared soil. These materials have good mulching characteristics, are weed-free and aesthetically acceptable.

New mulching materials have emerged in recent years.

Pelletized paper mulches have been developed to provide hydraulic mulch-like performance in an easy-to-apply form.

These mulches are compressed into small, cylindrical pellets that can be applied by hand or with spreaders or topdressers. They are typically made from recycled paper and contain a starter fertilizer. This permits mulching and fertilizing in one application.

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Mulches—

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Product Development

The first pelletized paper mulch on the market was developed and patented by Penn State University in 1995. PennMulch is a compressed pellet of recycled paper, water-absorbing polymer and starter fertilizer. Other pelletized paper mulches made from various materials have since come onto the market.

During the development of PennMulch, a field study was conducted to compare pelletized paper mulch performance with that of straw (3). For the study, a silt loam soil was fumigated with dazomet to kill existing vegetation and weed seeds in the soil. The soil was tilled to a depth of 4 inches, graded with hand rakes and seeded with Merit Kentucky bluegrass at 2.5 pounds per 1,000 square feet.

The treatments consisted of pelletized paper mulch, oat straw plus fertilizer, oat straw alone and an unmulched control. The pelletized paper mulch had a fertilizer analysis of 1-3-1 (nitrogen, phosphorus, potassium) with 100 percent of the nitrogen being quickly available. In the straw-plus-fertilizer treatments, the same fertilizer used in the production of the pelletized mulch was sprayed on the soil surface before straw application to ensure equal fertility in the mulching treatments.

Clippings were removed from the plots with a 20-inch reel mower 30 and 44 days after seeding. All broadleaf and grassy weeds were removed from the plots before the first clipping collection so that the weight of the weeds did not interfere with the weight of the turfgrass yield. Clippings were dried at 62 C for a minimum of 24 hours and weighed.

Results and Discussions

All of the mulching treatments performed very well in comparison with the unmulched control. At the 30-day mowing, all treatment results were statistically the same, except for the straw without fertilizer at 40 and 80 pounds per 1,000 square feet.

Clipping yield at 44 days after seeding showed all of the treatments had significantly higher yields than the unmulched control. The pelletized paper at 90 pounds per 1,000 square feet provided significantly higher yields than the other mulch treatments.

Conclusions

The effects of mulching on the establishment of Kentucky bluegrass were very similar for pelletized paper and oat straw. Pelletized paper mulch appears to be a good alternative to straw mulches.

Pelletized paper mulches are also attractive for golf course applications because of the ease of use and application. In addition, these mulches are weed-free, provide a neat appearance after application and do not have to be removed after germination.

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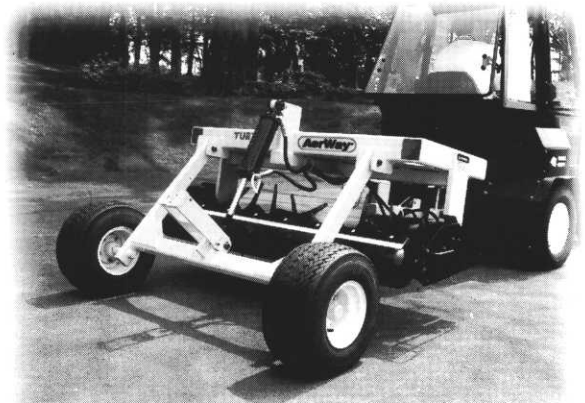
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Literature Cited

1. Adams, J.E. 1966. Influence of mulches on runoff, erosion and soil moisture depletion. *Soil Science Society of America Proceedings* 30:110-114.
2. Barkley, D.G., R.E. Blaser and R.E. Schmidt. 1965. Effect of mulches on microclimate and turf establishment. *Agronomy Journal* 57:189-192.
3. Hamilton, G.W., J.S. Gregos, L.P. Tredway and A.E. Gover. 1997. Pelletized paper as a mulch for turfgrass establishment. *International Turfgrass Society Research Journal* 8:101-107.
4. Harris, F.S., and H.H. Yao 1923. Effectiveness of mulches in preserving soil moisture. *Journal of Agriculture Research* 23:727-742.
5. Singer, M.J., and J. Blackard. 1978. Effect of mulching on sediment in runoff from simulated rainfall. *Soil Science Society of America Proceedings* 42:481-486.

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(Editor's Note: George W. Hamilton is senior lecturer of turfgrass science at Pennsylvania State University. PennMulch is a registered trademark of Lebanon-Seaboard Corp.)



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