Sod plugs, cut from field test plots, are transplanted to pots filled with sand to determine root production.

Herbicides for Commercial Sod: How Do They Influence the Crop

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WEED CONTROL chemicals are a must for successful commercial sod production. No matter how good the quality of grass seed that is sown or how refined the establishment and maintenance program, nature will assure a generous supply of weeds. These weeds will most likely be both broad-leaved and grassy types. Fortunately, there are weed control chemicals available that may enable the production of weed-free, quality turf. These chemicals have been around for some time and have been used extensively for turf purposes. Chemicals used in commercial sod production, however, must not delay the development of the crop or interfere with harvesting or successful establishment after harvest.

Studies were initiated at the Rhode Island Agricultural Experiment Station, starting in 1970, to evaluate effects of both crabgrass and broad-leaved herbicides when used in sod production. The goal was to determine whether these herbicides were safe when applied at various stages in the development of sod.

Standard rates of granular preemergence crabgrass herbicides including benefin (Balan), bensulide (Betasan), DCPA (Dacthal) and siduron (Tupersan) were applied in the spring to Kentucky bluegrass sod that was seeded in the fall and still developing (immature) and to mature stands ready for harvest. The rate of sod development was measured visually by assigning turf quality ratings and by plant, tiller and rhizome counts in some trials. Sod tensile strength measurements were also taken to determine development. Root production of

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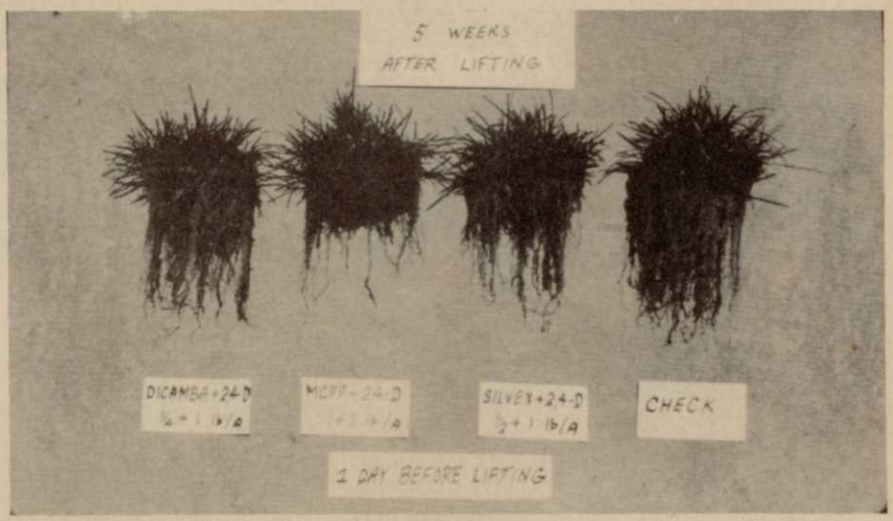
transplanted sod was evaluated by measuring dry weight of roots grown from four-inch plugs on sand. Root strength measurements were taken by recording the force necessary to lift sod plugs from soil.

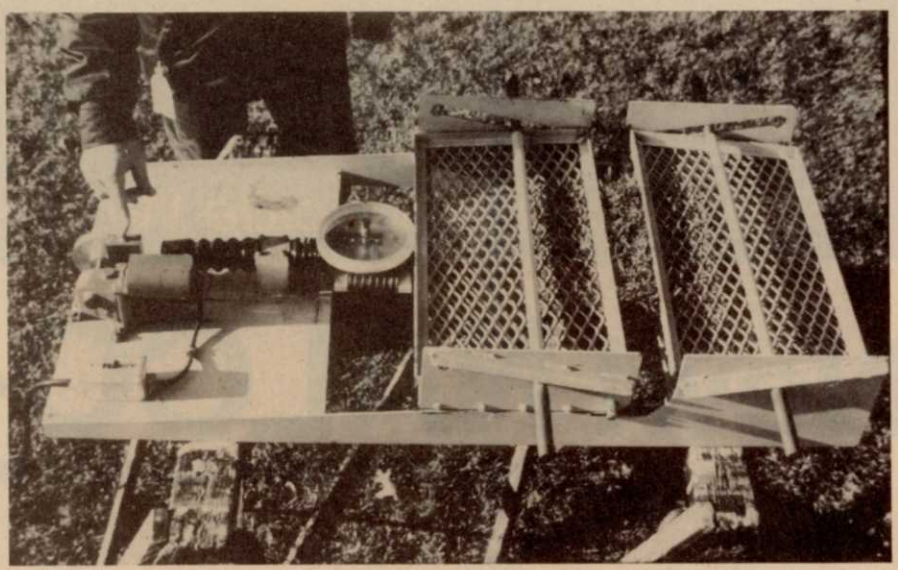
In another series of tests herbicides used for broad-leaved weed control were evaluated on mature sod. Standard rates of 2, 4-D spray mixtures with either dicamba (Banvel), mecoprop (MCPP) or silvex (2,4,5-TP) were applied in the spring and fall at various times before and after sod harvest. Rooting of the transplanted sod was evaluated by measuring root production and root strength.

Crabgrass herbicides applied to immature sod were not all beneficial. The grass treated with benefin and DCPA became coarser in texture and were of poorer quality within 2½ months of treatment. No visible adverse effects resulted from bensulide and siduron treatments. The tensile strength of sod, 2½ months after treatment, was reduced by benefin and, despite no adverse visual appearance, by bensulide. In fact, even five months after treatment, bensulide treated sod had reduced tensile strength. Tensile strength was not reduced by DCPA or siduron treatments.

In an effort to determine the influence of benefin and bensulide on plant development and relationship to sod strength, counts of plants, tillers and rhizomes were made 2½



Here are effects of herbicides on root growth of sod plugs grown for five weeks in pots filled with sand. Herbicides were applied one day before sod was lifted from the field and transplanted to pots.



This machine tests sod strength. A sod strip is clamped to the fixed stage at right and to moveable stage at left. When the machine is activated, the moveable stage is pulled to the left. The maximum force at which the sod breaks is measured by the scale in center of photo.

These sod plugs are transplanted and allowed to root. The rooted plugs are used to determine the force necessary to lift the plugs from the soil. The ring with the cross bar is placed under the plug and a nail is inserted so the cross bar can be located later for lifting.

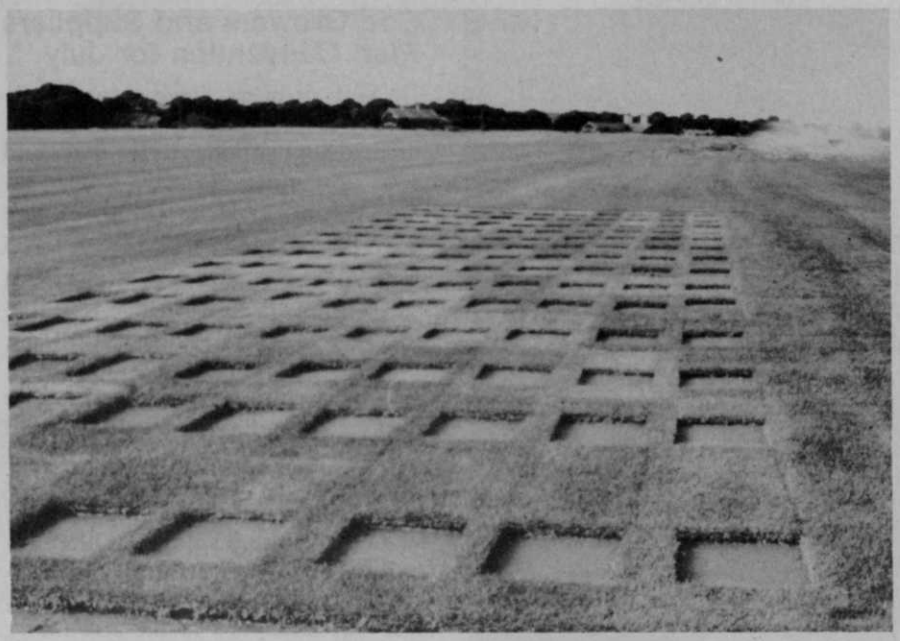
months after treatment. Benefin treatment on immature sod did reduce tiller and rhizome production. This could account for reduced tensile strength. There was no reduction in tiller or rhizome number with bensulide so it is possible that root production also influences sod strength.

When determining root growth of the immature sod transplanted four months after treatment is was determined that benefin, bensulide and DCPA inhibited rooting. No effect on rooting was detected with siduron treatment.

When the same four crabgrass herbicides were applied to mature sod no reduction in sod strength was noted when measured three months after treatment. Root growth measurements made at the same time showed inhibition only with bensulide.

On the basis of these trials it appears safe to use siduron for crabgrass control in young, developing stands of Kentucky bluegrass to be used for sod. On mature stands of sod results indicate that benefin, DCPA and siduron may be used safely for crabgrass control.

A sod plug is pulled from the soil to measure the force necessary to separate it from the soil. The metal hook is inserted through a nail hole and attached to the cross bar. A scale attached to the other end of the hook measures the maximum force necessary to lift the plug.



A view of an experimental sod plot after the sod was removed for strength tests or for transplanting to determine the effect of herbicides on rooting.

The broad-leaved weed control chemicals were applied only to mature turf. When used at the standard, recommended rates mixtures of 2, 4D with either dicamba, mecoprop or silvex applied four weeks before transplanting in the fall or spring did not effect sod rooting. Mixtures of 2,4-D with either mecoprop or silvex applied two weeks before harvest in the fall reduced root growth. No root inhibition was evident from the 2,4-D plus dicamba mixture. None of the three mixtures affected root growth from spring treatments made two weeks before transplanting.

All herbicide mixtures applied two weeks after sod installation in either spring or fall resulted in root inhibition. When the various mixtures were applied four weeks after transplanting in the spring there were no adverse affects on root growth. No fall treatments were made.

Conclusions based on results with the broad-leaved herbicides used on fully-developed sod are: (1) mixtures of 2,4-D with either dicamba, mecoprop or silvex can be used safely if applied at least four weeks before or after harvest. (2) if it is necessary to apply broad-leaved herbicide mixtures as close as two weeks before harvest it appears safe to use any of the three mixtures in the spring or 2,4-D plus dicamba in the fall. None of the mixtures should be applied within two weeks after transplanting in either spring or fall.

These studies should provide added assurance to commercial sod growers who rely on certain of the herbicides for effective and safe weed control.