Growth regulators yield different benefits

by John R. Hall III

Recent research has significantly enhanced our understanding of how turf growth regulators work.

Michigan State work was published by K.V. Hansen and B.E. Branham. It was done on Kentucky bluegrass using radioactive labeled carbon dioxide to determine how photosynthate (food) translocation is altered by applying growth regulators. The researchers compared Limit (amidochlor), Embark (mefluidide), Turf Growth Regulator (paclobutrazol), Cutless (flurprimidol) and an untreated check in both greenhouse and growth chamber studies.

Four weeks after application, mefluidide-treated plots were translocating significantly more food to the root system than all other treatments in the growth chamber study. Amount of photosynthate in the roots varied as noted: paclobutrazol 9%, flurprimidol 10%, amidochlor 15%, untreated check 27% and mefluidide 51%. This would obviously suggest the potential for increased root growth by using mefluidide.

In both studies, one week after application, the paclobutrazol caused significantly greater photosynthate translocation to axillary shoots than any of the other growth regulators. This suggests that paclobutrazol could potentially set the stage for increased turf density.

Two weeks after application, in the greenhouse study, the amidochlor was causing more food to be sent to the crown regions than the other materials. Since the crown region is a major storage area for plant food reserves, it is possible these plants would be in a good position to respond to environmental stresses.

The Ohio State work was published by R.J. Cooper, P.R. Henderlong, J.R. Street and K.J. Karnok. It was done on a perennial ecotype of annual bluegrass, evaluating the effect of mefluidide on seedhead suppression, root growth and turf quality. This work illustrated the effectiveness of mefluidide in suppressing annual bluegrass seedhead formation at very low rates (1/16 lb. AI/A). An 80% reduction in seedhead formation was brought about 45 days after treatment at the above rate. Double this rate only increased seedhead suppression 18%. Mefluidide is the most economically effective seedhead suppressor available for fine turf.

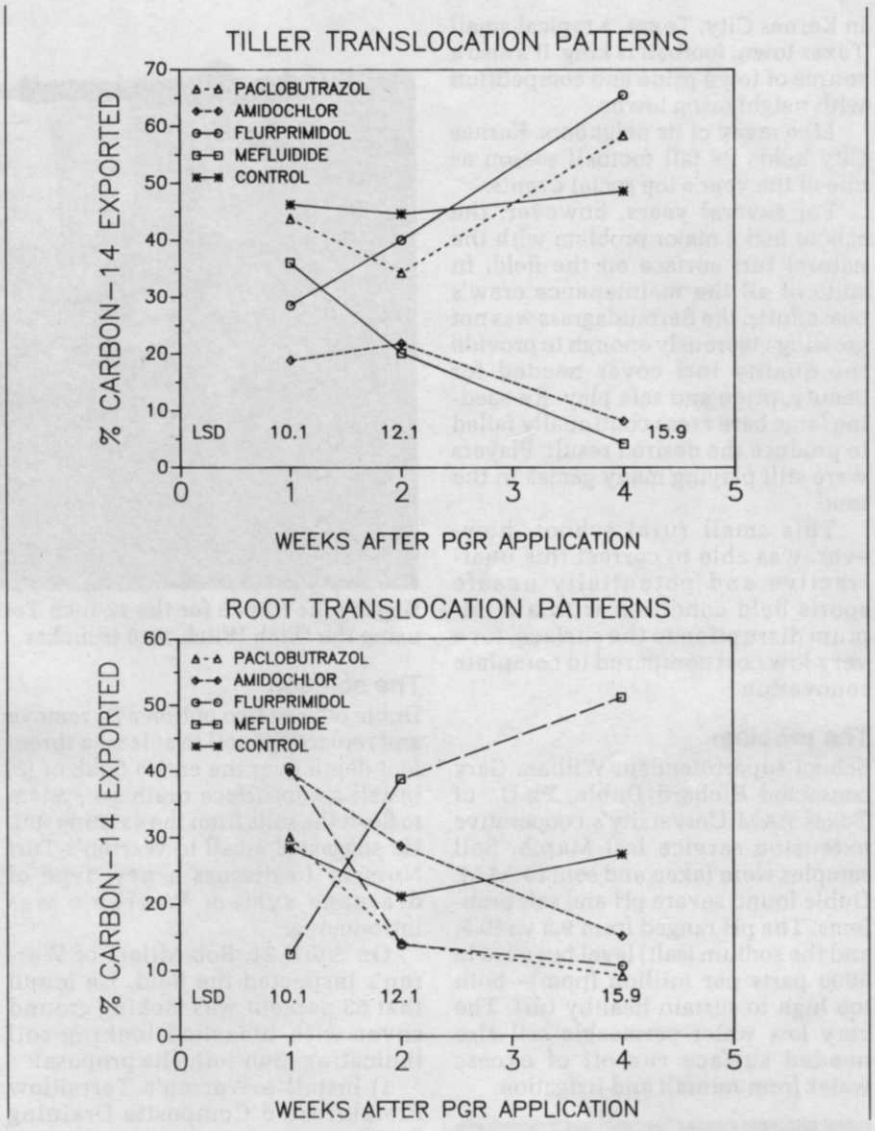
The impact the 1/16 lb. AI/A rate had on root elongation rate (millimeters growth per root per week) was most striking. A March 31st treatment at the above rate led to significantly greater root growth rates when measured on April 13 (89%), May 25 (62%), July 13 (102%) and August 3 (1375%) when compared with untreated plots.

This increased growth rate was reflected in the effect on maximum rooting depth in the annual bluegrass. When maximum rooting depth of the annual bluegrass was measured on August 3, following the March 21 treatment, the treated plots had five times more root system than the untreated (2.75 inches vs. 0.51 inches).

The 1/16 lb. AI/A rate did produce some yellowing which reduced quality slightly, 14 to 45 days following application. However, quality was significantly better on the mefluidide-treated plots 45 to 70 days after the application.

The Michigan State and Ohio State work have illustrated some very important differences in growth regulators. Each material apears to have a slightly different effect on photosynthate partitioning in the Kentucky bluegrass plant. Turf professionals can certainly benefit from being aware of these effects and using them to their advantage. By choosing the right growth regulator for your situation, you can get seedhead suppression, enhanced root growth, increased density or potential for stress survival. **LM**

MICHIGAN STATE RESEARCH



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