Alternatives to 2,4–D

Because of a suggested link in the literature between chronic exposure to phenoxyacetic acid herbicides and a rare form of cancer, alternatives to 2,4-D for the control of broadleaved weeds in turfgrass are being investigated. A Cornell researcher recently compared several non-phenoxy herbicides with 2,4-D, alone and in combination, for control of white clover, dandelion, and broadleaf plantain. Control of broad-leaved plantain equivalent to that of 2,4-D was achieved with a tank mix of Clopyralid plus Triclopyr. BAS 514 alone or in tank mixes with Clopyralid, Chlorflurenol, Dicamba, or Triclopyr produced dandelion control equivalent to or better than that realized by 2,4-D alone. White clover was effectively controlled by all non-phenoxy herbicides tested, but not by 2,4-D. A pre-mixed herbicide combination of Clopyralid plus Triclopyr gave effective control of all three weed species, and is known to control other weeds as well (buckthorn plantain, yellow woodsorrel, ground ivy). Hence this product represents a promising alternative in certain turfgrass applications to the use of phenoxyacetic herbicides, although more research regarding the tolerance of turfgrass to this mixture, and its weed control spectrum, is needed. *(From: Joseph C. Neal, 1990. Non-Phenoxy Herbicides for Perennial Broadleaf Weed Control in Cool-Season Turf. Weed Tech. 4(3):555-559.)*

Control of Pink and Gray Snow Mold

Mercury is undesirable environmentally, and pentachloronitrobenzene is toxic to several grass species, but few other materials can control snow molds under a snow cover lasting 90 days or more. Canadian researchers have now shown that two triazole fungicides, triadimefon and propiconazole, are as effective as PCNB in the control of gray snow mold, and propiconazole, but not triadimenfon, is as effective as PCNB in controlling pink snow mold. Additionally, both triadimenfon and propiconazole appeared to reduce dollar spot infestations for at least a year following application, whereas PCNB showed either no or a small opposite effect in this regard. *(From: L.L. Burpee, A.E. Mueller, and D.J. Hannusch. 1990. Control of Typhula Blight and Pink Snow Mold of Creeping Bentgrass and Residual Suppression of Dollarspot by Triadimenfon and Propiconazole. Plant Disease 74(9):687-689.)*

Biostimulators for Bluegrass

In an attempt to compare the influence of certain "biostimulators" with a chelated iron source on the development of Kentucky bluegrass seedlings, researchers applied foliar applications of benzyladenine, propiconazole, triadimefon, a fortified seaweed extract, and iron phosphate citrate, alone or in combination, to single bluegrass seedlings in outdoor and greenhouse experiments. The fortified seaweed extract significantly increased all measured parameters of root and shoot development, propiconazole and triadimenfon were intermediate in effect, and benzyladenine was least effective of the biostimulators. The effect of chelated iron was positive but not as great as the better biostimulators; most effects seemed due to enchanced leaf and lateral bud development. Results of the iron and biostimulator combinations were highly variable, indicating the need for further study of these mixtures. *(From: J.M. Goatley, Jr., and R.E. Schmidt. 1990. Seedling Kentucky Bluegrass Growth Responses to Chelated Iron and Biostimulator Materials. Agronomy Journal:82:901-905.)*

Irrigation wih Sewage Effluent

Desert soils in the southwestern U.S. are often high in salts, sodium, and pH, and in some localities local law requies golf courses to use sewage effluent for irrigation, potentially exacerbating existing saline conditions. In the first study of its kind on soils of this type, researchers near Tuscon, Arizona compared the effects on soil and leachate properties of irrigating a golf course with sewage effluent *vs* potable well water over a 16 month period. Results of the soil study found no significant differences between treatments for pH, potassium, calcium, magnesium, iron, zinc, copper, or manganese, while levels of sodium, phosphorous, and nitrate nitrogen increased significantly in the effluent treatment. All increases were directly attributable to inputs from the effluent water, but none was great enought to injure the Bermudagrass turf. In the leachate study, pH, potassium, and carbonic acid content were not significantly different between treatments, while the sodium content was significantly higher. Conversely, calcium and magnesium were significantly higher in the potable leachate. In spite of the increased salinity of the effluent leachate,

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Scanning the Journals

A review of current journal articles

Soil Testing

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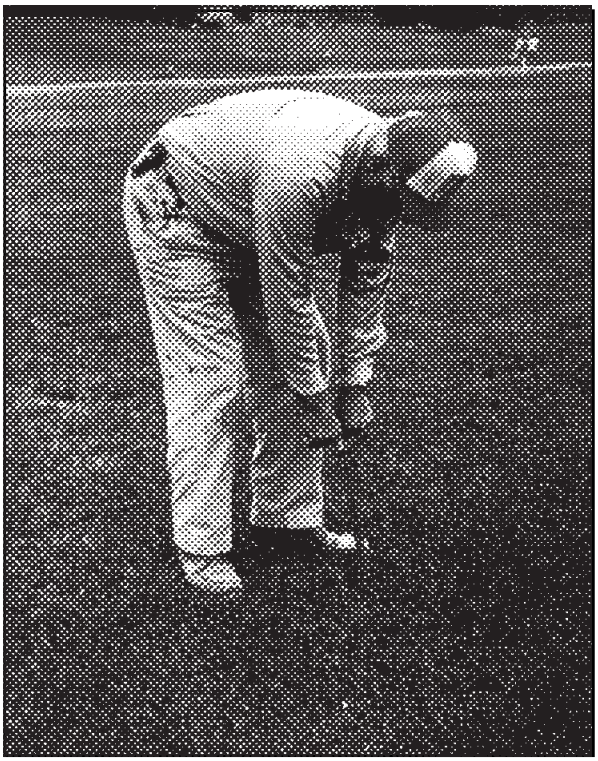
types around the state.

Select a lab service that uses soil test calibration data for the interpretation of their results. Labs associated with the land grant universities usually have this information base as well as a knowledge of the soils in your state. Many commercial labs are basing their recommendations on calibration work from universities as well. Ask your lab representative how they arrive at their recommendations. If they don't know, find another lab.



***Soil Sampling**: 3 to 4 inch depth; remove thatch; take representative sample; collect 1 pint per sample; label bag; keep record.*

One of the most questionable practices being made by laboratories today is interpreting results for micronutrients. This is a perfect example of how our ability to analyze for a nutrient has exceeded our ability to interpret the results. Many factors besides soil levels will influence micronutrient availability. Organic matter, soil temperature, even grass species and cultivar will influence availability. Due to the complex nature of micronutrients, there has been little soil test calibration work done on turfgrasses. Therefore, if someone recommends that you apply micronutrients to turf because of low soil test levels, question their recommendation.

In summary, the following steps should help you get the most out of your soil testing program:

- Carefully follow soil sampling instructions. Keep records of how and where samples were taken.
- Look at several labs and find out if their testing procedures are the most appropriate methods for your soil types.
- Once you have found a lab, stick with them. Labs are not likely to change methods. Using different labs could mean different results.
- Soil test at the time of establishment and every three to four years thereafter. Allow at least a month turn around time for results.
- If you have any questions on the test results or interpretation, don't be afraid to ask. You will be able to obtain more information from the test report as your understanding of the process improves.

Norman W. Hummel, Jr.

• Carefully follow soil sampling instructions. Keep good records.

• Select a soil lab that suits your soil type.

•Choose a lab and stick with it to insure consistent results.

• Test at time of establishment and then every three to four years.

• If you have any questions on the test results or interpretations, ask.

Scanning the Journals

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it did not exceed EPA maximum levels for drinking or agricultural water use. The study is being continued to evaluate long-term effects. *(From:A.R. Hayes, C.F. Mancino, and I.L. Pepper. 1990. Irrigation of Turfgrass with Secondary Sewage Effulent: I. Soil and Leachate Water Quality. Agronomy Jounal 82(5): 939-943.)*