

Buffalo plays ball thanks to seed company



Buffalo Mayor Stanley M. Makowski operates seeder in ceremony to begin reseeding of the city's 92 ball diamonds. With him, from left, are Glatt Glattly, Whitney-Dickinson representative; Parks Commissioner Gus Franczyk; and Anthony Gioia, chairman, Chamber of Commerce Buffalo Beautiful Committee.

When the City of Buffalo, New York dug out from under the worst winter on record, they found their softball and baseball fields virtually void of grass.

The more than 190 inches of snow had to go somewhere and to make road traffic possible, the snow was trucked to ball fields and parks throughout the city. The trucks and snow piling equipment made a shambles of the ball diamonds on the city's 76 softball and 16 baseball fields.

E. R. Townsend, president of Whitney-Dickinson Seeds, Inc., working through the Buffalo Area Chamber of Commerce, offered to furnish enough Manhattan Perennial Ryegrass to reseed the 92 ball diamonds.

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Resistant red oak seedlings isolated

Resistance to oak wilt disease, for the first time, has been observed in red oak seedlings. The screening procedure, which scientists developed and used to identify the resistant seedlings, may insure that red oaks remain prominent in the eastern half of the nation, providing beauty and shade in urban and rural settings. But science has yet to find a way to insure that the species remains as an important hardwood lumber tree.

Scientists of USDA's Agricultural Research Service (ARS) at Madison, Wis., and their colleagues at the University of Wisconsin, screened more than a thousand seedlings from which they found 17 that were resistant.

"These seedlings developed no oak wilt symptoms after we used a hypodermic needle to inoculate them with the fungal-disease causing organism in 3 successive years," said ARS plant pathologist Richard D. Durbin.

Further research is being conducted to find whether the seedlings may still succumb to infections by natural agents such as beetle.

Efforts to identify resistant red oaks in nature are hampered because exacting conditions necessary for disease spread may not be present at many times, says Dr. Durbin. The preliminary screening procedure makes testing of large numbers of seedlings possible in the greenhouse.

"If the promising results of our screening are further confirmed, resistant red oaks could be multiplied in sufficient numbers for the nursery trade within a few years," says Dr. Durbin. But some basic stumbling blocks must be overcome before they can be increased in large numbers.

In their search for ways to mass produce the disease-resistant red oak, the scientists are trying to develop several vegetative techniques including tissue culturing and rooting. "Reproducing the red oak sexually is not a viable alternative," says Dr. Durbin, "because we would have to wait 30 to 40 years for the trees to develop sexual maturity." Genetically, red oak trees are so complex or heterogeneous that many of the offspring would not be resistant anyway.

New techniques for vegetatively propagating the resistant oaks — if they can be developed soon — will be most timely. Dr. Durbin notes that oak wilt has spread alarmingly during the past three decades in eastern and central states where oaks are the leading hardwood timber species and important as shade trees. Some researchers have predicted that within the next 30 years about half of the nation's oak trees will be afflicted. □

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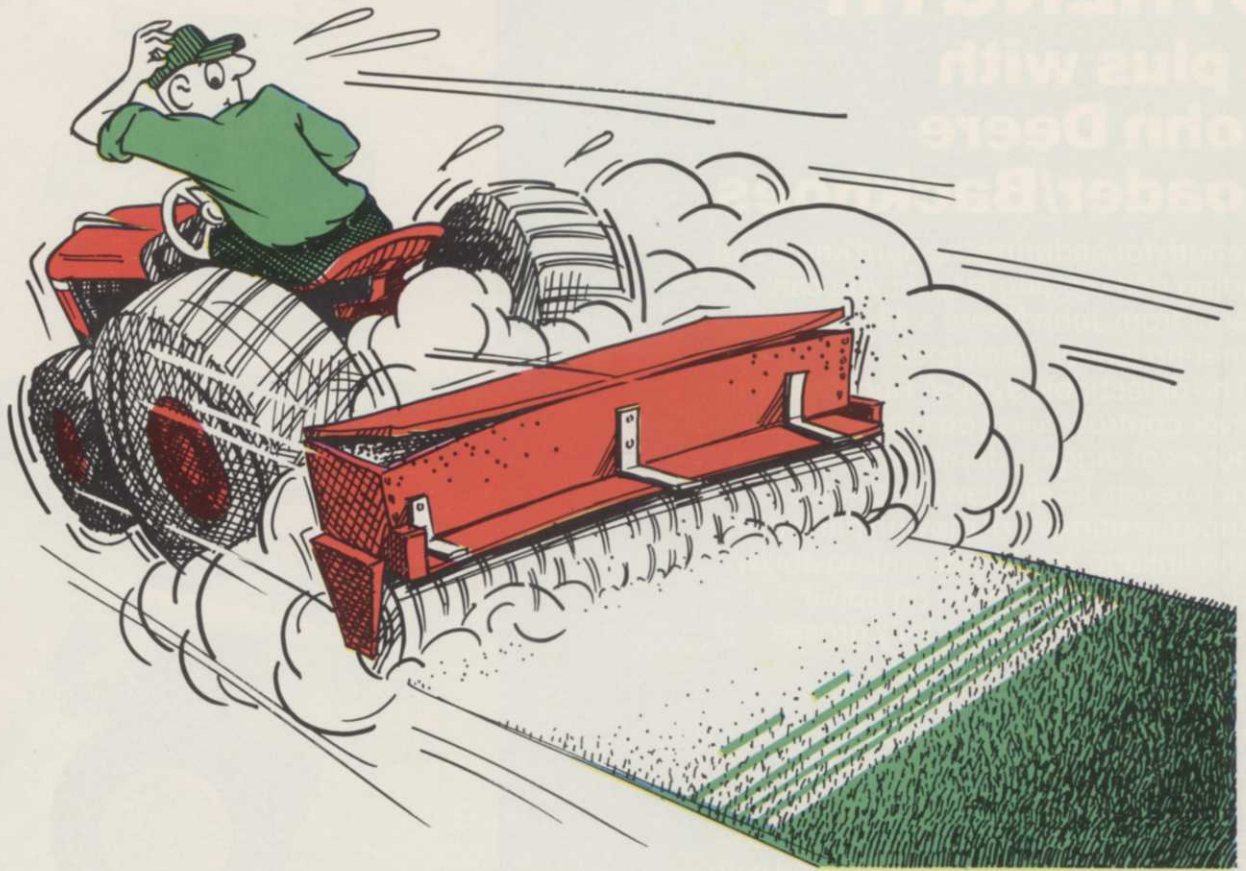
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Effluent water

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on greenbelt irrigation using sewage effluent performed by Younger of UC Riverside (in collaboration with the U.S. Forest Service), is among the most basic research projects yet accomplished. This investigation, in the famed Lake Arrowhead region of California, demonstrated no evidence of degradation or contamination of surface or ground waters, after 5 years of monitoring. The implications for golf course irrigation are encouraging, and more specific research on turfgrasses will doubtless benefit from this cornerstone work. Figure 3 illustrates a student withdrawing a ground water sample in this Lake Arrowhead project.

Economics of waste water reuse is a subject of secondary importance to most researchers, yet neces-

sarily concerns the average golf course superintendent contemplating use. A more definitive answer may be the result of a new research grant to Younger of UC Riverside from the Office of Water Research & Technology, Department of Interior. Commencing this Fall, two graduate students under Younger's direction will compare costs of processing, piping and discharging effluent using this technique, with the costs of disposing by alternate means (as, to the ocean) and the economic value of water recovered.

In considering the economics of waste water effluent, even on a shirt cuff basis, some credit should be given to the fertilizer ingredients which accompany it when used in irrigation. Thus, as characterized by Dr. Wade L. Berry of UCLA's Department of Nuclear Medicine, a typical urban effluent can add 4 lb. of nitrogen, 2.7 lb. of phosphorus and 2.3 lb. of potassium, for each acre-inch applied. In the Southern California area, where approximately 40 acre-inches of water are

needed to replace evapotranspiration losses, this level of use would add 160 lb. of nitrogen, 108 lb. of phosphorus and 92 lb. of potassium each year.

"In most instances," he concludes, "this would supply more phosphorus and potassium than presently used and also most of the nitrogen for low use turf, although additional nitrogen would be needed, especially for high use turf." At today's fertilizer prices, this deduction can be very helpful.

It is true that irrigation lines, pumps and storage facilities may cost additional dollars because of special needs to filter, chlorinate and contain a more corrosive substance. However, even if this waste effluent must be purchased, this expense may be only an estimated 1/3 of domestic water costs. If a separate filter system is required at the golf course site, Laguna Hills superintendent John Polder estimates a cost of \$5,400 for a 1,000 gpm automatic system, or \$4,000 for a manual

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Effluent water

Continued from page 45

back-flush system (plus installation charges).

"When all these things are weighed," concludes Younger of UC Riverside, "you can't help but conclude that it will be economical." A rather unequivocal statement for most scientists! However, Younger has plenty of specific research behind him to back up this conviction. He believes that this is just as true for a governmental agency, which charges for its effluent water, as it is for the golf course user who must pay for it. No doubt, in drought-plagued California, Younger is as impressed with the need to conserve a precious commodity, as with the relatively low costs and economic attractiveness.

Soil preparation key consideration

Needless to say, soil prepara-

tion is important where effluent water is to be used. Sandy loams are generally preferable; clay or sands are to be avoided. If greens are constructed according to USGA specifications, clay soils will be avoided and good percolation and drainage will assure less salt accumulation. Internal drainage lines will help this desirable flow.

As a starting point, Professor Younger highly recommends a thorough soil survey. In some cases, a site may be unsuited to effluent usage. Thus, a shallow soil over rock or hardpan may cause inadequately purified water to move horizontally into surface waters or through rock fissures into ground waters. He advises that infiltration rates and hydraulic conductivity of the soil be determined in advance, so that water application rates can be adjusted to avoid surface runoff or ponding.

A special problem is created by a water having a high sodium absorption ratio (SAR), in the presence of a clay soil. Such soils may lose their structure in time and become very

poor for plant growth or water purification. Sodium acts to deflocculate soil, which then becomes compact and a poor hydraulic conductor. Gypsum is sometimes successful in correcting this situation, although avoiding this combination is preferable.

To illustrate how much difference is possible in soil readings following effluent irrigations, we may consider the Laguna Hills Golf Course in Southern California. Here, soil test data kept since 1971 show an increase of up to 125 percent in SAR readings, for a clay soil irrigated with effluent water as compared to irrigation with Metropolitan water. Similarly, increases in EC readings up to 100 percent have been noted, particularly after summer irrigation with effluent. However, readings for SAR below 5.0 or EC below 3.5 are considered satisfactory by Laguna Hills maintenance personnel.

In setting up a waste water irrigation program, Younger recom-

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