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U.S. Plant Patent 3151

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duction. The state publishes a list of approved certified seed lots for sod growers seeking certification. Pre-plant inspections are meant to find grassy weed problems such as yellow nutsedge. A serious problem with such weeds will exclude the field from certification unless it is fumigated for total weed control.

Seed inspection is intended to find those lots of seed which have no bentgrass of *Poa annua*. It is possible to purchase certified seed with the minimum allowable percentage of *Poa annua* or bentgrass. Some lots harvested from exceptionally clean fields may have virtually no bent or *Poa annua*. It is lots from these fields that inspectors are looking for to recommend to sod growers. Indyk believes that if certification accomplishes nothing else, it gets seed growers to direct their best seed to sod producers in states with certification programs.

Of course, not all sod produced in these states is certified. As little as 10 percent of the acreage may be certified sod. But when landscape architects who support certification specify certified sod, only that ten percent of the acreage is eligible.

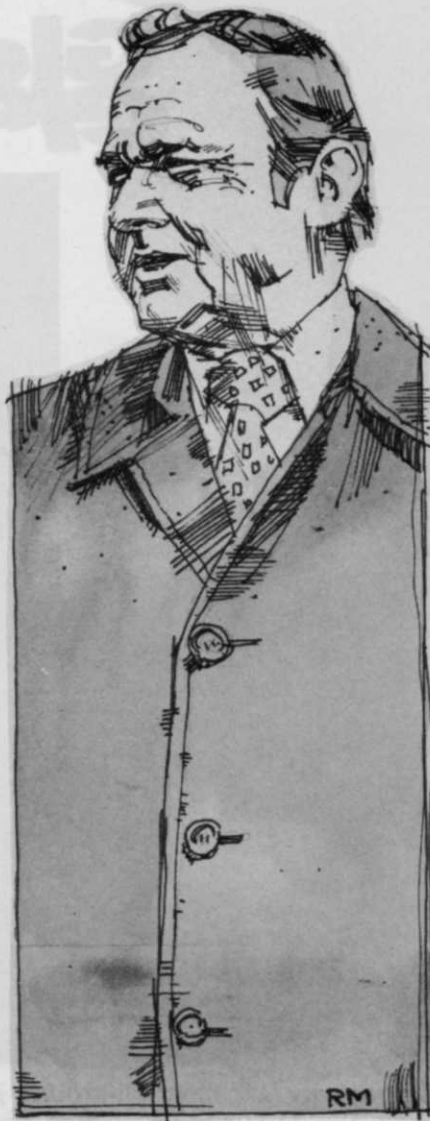
One unique and pressing problem today with certification is that suppliers of sod to New Jersey whose farms are in New York want to grow and meet certified sod requirements. New Jersey says these growers are out of jurisdiction and therefore cannot meet New Jersey certified sod requirements.

Florida had a certification program for vegetative parent material before New Jersey's sod certification program, according to Indyk. Other states considering programs are California and Nebraska. Pennsylvania has a program underway.

Some midwestern sod producers feel certification is unnecessary and slows down progress with new turfgrass varieties. According to these growers competition keeps everyone on their toes. Dr. Jack Butler of Colorado State University in Colorado Springs feels this way. He helped sod producers in Illinois as director of that state's turf program during the 60's. Ben Warren and Dr. William Daniel of Purdue also feel this way.

Certification is also a marketing tool. It is intended to eliminate doubts of those afraid of sod quality. Confidence in sod varies across the country. Architects and contractors strongly recommend sod in some areas, such as Illinois, California, Colorado, and many eastern states.

Sod producers continue to work for other ways to strengthen the position of sod compared to seeding. One way is to gain legislation which requires grass cover prior to release of bonding and issuance of occupancy permits. Contractors may not be willing to wait 60 days for seed to germinate and establish an acceptably thick turf. They are liable often for six months or more. The extra cost of sod must be sold to the customer. In the Midwest, seeding costs approximately 6 - 8 cents per square foot as compared to sod at that figure wholesale plus the cost of installation. Retail sod is priced in the area of 15 cents per square foot in Ohio.



**Henry Indyk**

Rutgers University turf expert who helped organize New Jersey and American Sod Producer Associations.

The instant lawn concept has been pushed for years. Although there are many questions and doubts about improved perennial ryegrasses and tall fescues, they may provide some challenge in certain areas. Establishment time is cut to about four weeks with these turfgrasses when seeded. Basically, it is a question of what is acceptable turf cover for job completion.

The 70's saw the sod harvester take over the sod industry. The Brouwer, Nunes and Princeton harvesters are now found on nearly every sod farm. The harvester drastically cut manpower requirements in harvesting sod. Whereas harvesting with a sod cutter may require up to ten men to accomplish, harvesters cut this number to three in many cases.

The harvester cuts and lifts the sod onto a conveyer. Depending upon the model, harvesters can cut rolls, slabs or folds of sod. After the harvester has rolled or folded the sod, a person on the back of the machine places the sod onto a pallet. When the pallet is filled, the harvester puts it down for pick up by a forklift, and continues cutting. The need to pick up individual rolls of sod from the field is eliminated. The cutting speed of harvesters is faster than sod cutters as well.

The harvester allowed sod producers to handle more acreage with fewer employees. Other improvements to harvesters will further speed up production and reduce waste. These changes however, come at a price. Harvester manufacturers have to prove the cost/benefit of more expensive machinery.

The sod cutter is by no means extinct. Ryan and Turfco of Minneapolis manufacture sod cutters for smaller acreages and for situations where portability is important, such as the remaining pasture sod market. Many cemeteries, golf courses, and parks have sod nurseries for replacement of damaged turf areas. A number of firms making sod cutters and harvesters have stopped doing so. Ryan manufactured the Brouwer harvester in the late 60's. Names like Daymon, Big Brute, Sod Winder, Big J, Gieringer, and Hadfield are now history.

Other progress has helped the sod producer. The improved turfgrasses reduce losses to disease, netting reduces the dependency on sod knitting and shortens production time when needed, and better field drainage gives the sod farmer better



**William Daniel**

Purdue University turf professor who provided early support to the Midwestern, Michigan and American Sod Producer Association.

control over weather. Sod production is now a fairly precise operation with considerable control by the grower. If needed, he can push a crop of sod to be harvested six to eight months after seeding. For this purpose some sod producers keep a portion of their acreage netted and well irrigated. They can also utilize more aggressive Kentucky bluegrass cultivars to speed up the sod, or increase fertilization.

Eastside Turf Nursery grows blends of bluegrass to give the sod the potential to adjust to varying levels of maintenance following installation. Certification officials in New Jersey, Maryland and Virginia encourage such thinking. Shade tolerant bluegrasses and creeping red fescues are often added to provide a hedge against installation in shady areas. Some sod growers provide customers with educational pamphlets on sod care to assure proper maintenance of the sod. ASPA provides such pamphlets to members.

The future holds further developments for sod, especially in the areas of harvesting and installation. Installation remains the labor intensive portion of sod use. "The amount of sod sold could double if a method to lay the sod by machinery could be found," says Dr. Daniel. The device would have to be easily portable, reliable, and maneuverable on site. It should lay the sod faster than it was harvested.

Princeton and Beck's Turf Nurseries have experimented with the width and length of the roll for speeding up harvesting and laying. Princeton offers a 20-inch width on some of its harvesters and Woodrow Wilson claims a 48-inch length is the longest that one man can lay in one motion. As for width, Wilson claims the 20-inch width reduces trimming since it fits standard dimensions of tree lawns and other turf areas better than 16- or 18-inch widths.

Beck's offers a sod handling system which includes a harvester that cuts three 18-inch wide rolls simultaneously and a forklift, modified, like those that move rolls of carpet, to transport the sod from the harvester to the truck and from the truck onto the job site. The lengths of the rolls can be set according to the measurements of the job. The system is only available on a franchise basis.

Advanced models of current harvesters further reduce manpower and material handling needs. The

new Brouwer harvester has automatic steering which either eliminates strips between rows or standardizes them for vegetative regrowth. The large Princeton, costing more than \$100,000 is a combine-like harvester which reloads pallets as one is filled and lowered, has a closed cab, and the additional horsepower of machines that size.

Equipment for net setting, leveling the seedbed, moving pallets, and unloading at the job site have all added to the mechanization of the sod industry.

Warm season operation has had its share of inventors too. Stolonizers, pluggers, planters and other means of handling vegetatively grown sod and stolons were invented simultaneously with cool season machinery by major southern sod producers such as Southern Turf Nurseries and Cal Turf. Ray Jensen and Toby Grether developed various pieces of equipment for southern sod production.



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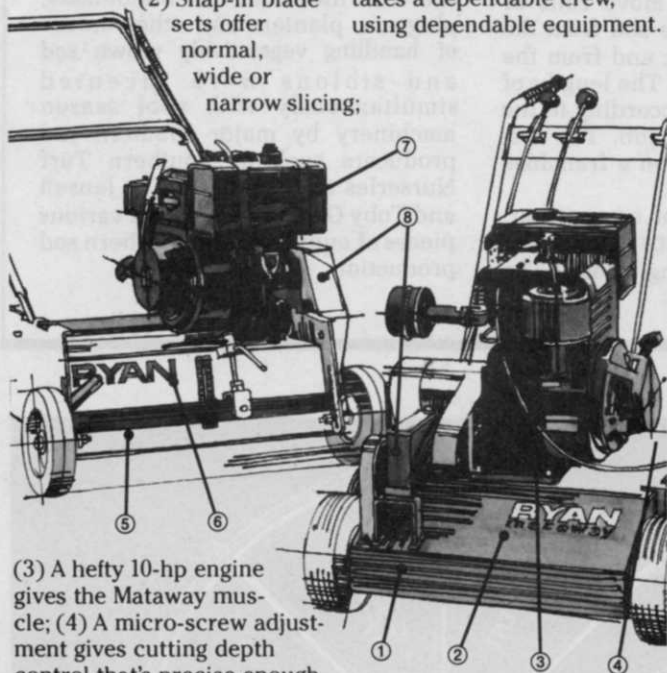
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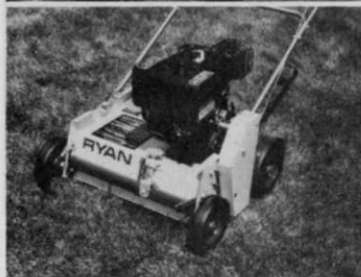
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## EQUIPMENT

### Ryan Turf Equipment

Ryan Turf Equipment, a division of OMC/Lincoln, has devoted effort to meeting the needs of sod producers longer than any other company. Since the late 40's, Ryan has manufactured and continuously improved its sod cutter, which dominated the industry into the 70's. During the late 60's it manufactured and marketed the Brouwer harvester until Brouwer assumed production and marketing responsibility in 1972.

Art Ryan designed the sod cutter produced originally by K & N Machine Works of St. Paul, MN. In 1950, K & N offered an 18-inch version, a step up from the original 12-inch model. The Ryan Junior sod cutter was designed in 1956. In 1963, K & N changed its corporate name to Ryan Turf Equipment Co.. Within the next five years, Ryan introduced the sod roller (1965) and the sulky roller (1968).

The Ryan corporate policy is "whenever improvements are made on any product, the improvement is designed so that it can also be adapted to the present machines in the field."



Heavy duty sod cutter (top) is an improved version of a 1947 model. Sod cutter with sulky roller (bottom) still meets the needs of many sod producers.



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## COOL SEASON PRODUCTION

From two nuclei, Illinois and New Jersey, cultivation of cool season sod production spread in the 60's. Michigan, Indiana, Minnesota, Wisconsin, and Ohio sod industries grew in number of firms and competitiveness. The midwestern boom spread westward to Missouri, Kansas, Colorado, Nebraska and California in the late 60's.

From New Jersey, growth spread quickly to Maryland, Virginia and Pennsylvania and northward to New York and Connecticut. By the early 70's, cool season cultivated sod production was clearly established and busy providing the needs of a boom in housing and industrial building. Competitiveness kept prices down forcing growers to work toward

volume for profit. Mechanization clearly separated the men from the boys and later helped stabilize the market to its current position.

Like the stripping crews in seed production, the pasture sod business faded as newer technology took over. Sod nurseries grew in size and began offering a variety of turfgrasses. Seed companies and extension turf specialists saw the potential of the market and began providing special attention to sod production. Michigan, under pressure from the Sod Growers of Michigan and the Michigan Turfgrass Foundation, legislated a special turf fund for research. Turf specialists now had at least part of their work time designated for sod production service. Sod was a

separate power from golf but served to supplement the turf cause in turf research from a public funding standpoint. Older research programs such as Pennsylvania, Ohio, New Jersey, Virginia, Maryland, Michigan, Illinois, and Nebraska found new support and grew as a result. The second generation turf researcher was studying during a boom period for turf. Some of them moved from older institutions to newer programs such as California, Colorado, Oklahoma and Texas and broadened turf research there.

It was the sod producer that really spread the word about improved turfgrasses. The obvious difference of a lawn sodded with an improved turfgrass next to one sodded or



Ben Warren and assistant in turf greenhouse evaluating turfgrass selections.

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# PROFILE

## Pine Island Turf Nursery

The sod industry grew rapidly in the 60's. An example of a firm who entered the business in the mid-60's is Charles Lain, owner of Pine Island Turf Nursery in New York.

Lain left his job with Weyerhaeuser in 1964 and started a sod nursery in 1964. In 1966, he stepped out on his own. He served as president of the American Sod Producers Association in 1979 and today manages a 435 acre business with sales of more than \$500,000.

Lain's nursery is located in New York's largest sod growing region. The area has more than 3,000 acres of sod production on its black, mucky soil. Lain competes with Warren's Turf Nursery in the same area and other growers serving the New York City area including DeLalio and McGovern sod farms in Long Island.

The Pine Island area is among the richest in terms of soil fertility in the country, with vast onion, lettuce and celery production. The soil is acidic and contains a fair amount of aluminum and iron. "Chemicals that work on upland soil don't always work on muck soils," says Lain. In the fall, he applies 600 lbs./acre of 10-30-20 and three tons of lime per acre. He feeds again in late October with 300 lbs. of 20-5-5 and finally the next spring with 350 lbs./acre of 45 percent urea. Based on soil tests, he adds copper and adjusts the phosphate. He supplements the area's 25 inches of rainfall with irrigation.

Lain used Ryan sod cutters until 1974 when he bought his first Brouwer harvester. "The harvester has allowed us to get more production per acre by reducing loss between five and ten percent," says Lain. "It also allows us to harvest more tender, younger sod."

"It used to take 12 workers six hours to harvest one acre of sod using the sod cutter. Today, we harvest an acre in less than four hours with three to four workers," Lain boasts. The harvester enabled Lain to reduce peak season labor by eight persons.

Lain grows a blend of Adelphi, and two of three other improved Kentucky bluegrasses, Touchdown, Majestic and Glade. For shady areas, Lain sells a mixture of Warren's A-34, Glade, and Fortress and Jamestown fescues.

"Sod is plagued much more by weeds than disease," says Lain. After harvesting he applies Roundup to eliminate weeds such as Quackgrass. Crabgrass, foxtail, barnyardgrass, and other weeds are controlled by spring and fall applications of Banvel-D and 2-4,D and two applications of D.S.M.A.

In 1977, Lain lost nearly a third of his mature sod to leaf spot after a very wet spring. Lain indicated fungicide treatments are not required as often in his area as in others.

Marketing is a firm commitment to Lain. He spends nearly ten percent of his sales on billboards, newspaper advertising, brochures and radio messages. Sales have increased by nearly 20 percent per year since 1976. Eighty percent of his sales are to landscape contractors, 15 percent to garden centers, and five percent retail. He often provides retail customers with maintenance information to help assure the sod of proper care and Lain of a satisfied customer. *Story and interview by Carol Rose.*

seeded with common Kentucky bluegrass made the public take notice of improved turfgrasses. The demand upon garden centers and landscape contractors for improved turfgrasses grew. Landscape architects starting specifying the improved Kentucky bluegrasses.

Today, the number of new turfgrass cultivars is clouding the issue of what type of sod to produce. Sod producers must anticipate demand 18 months ahead of time. They know they have good demand for certain solid performers. Their willingness to devote much acreage to a steady stream of improved grasses is limited to the sales advantage of switching from one to another. So, their acceptance is slow



**Gerry Brouwer**

*Ontario sod producer and equipment maker who helped spur the industry on with his side tracking sod harvester.*

and cautious. Each time they add a new turfgrass they also accept the need to educate customers of the advantage of it. The fact that landscape contractors and architects are better voiced on improved turfgrasses does speed up the educational process. Therefore, seed growers have a larger educational job to do.

The number of sod producers has stabilized in the last five years. Acreages increase to meet rising demand. The market appears just as solid as Ben Warren found it in the late 30's, and some conglomerates are acquiring sod nurseries. Two examples are Cal Turf's acquisition by American Garden Products and its takeover by Amfac of Honolulu, a large agribusiness corporation, and the purchase of Southern Turf Nur-



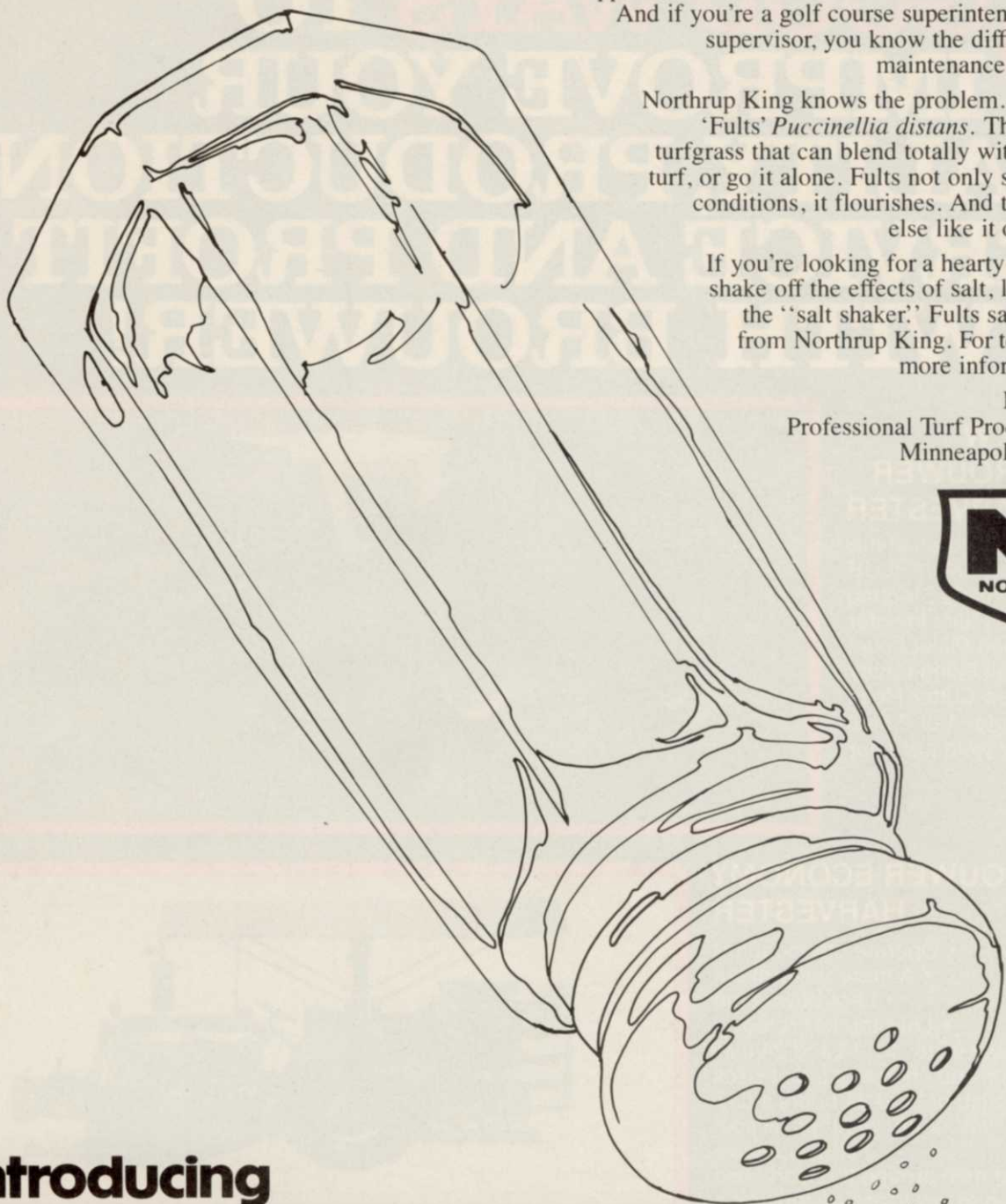
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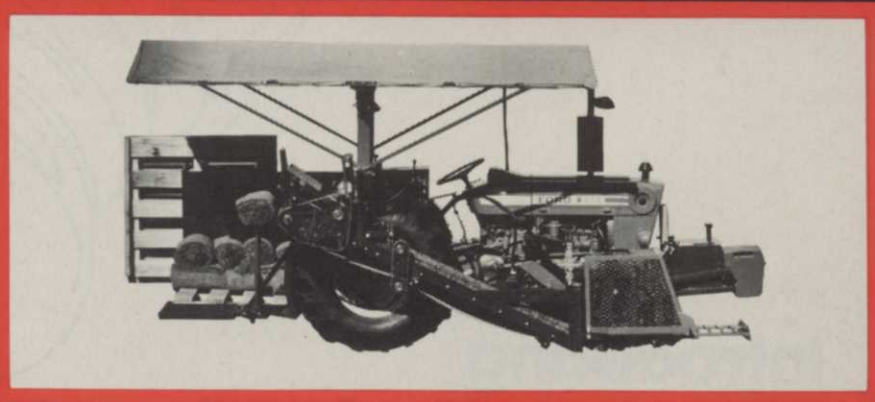
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