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Wiley Miner, left, truly one of the giants of the sod industry receives a plaque in recognition of his selection to the New Jersey Turfgrass Association Hall of Fame. Making the presentation is Paul Boizell past president of NJTA and golf course superintendent at Fiddler's Elbow Country Club. The ceremony was held at Expo '78 at the Cherry Hill Hyatt House.

Wiley Miner Newest Member Of N.J. Turfgrass Hall Of Fame

"Farmer, inventor, organizer, manufacturer, pioneer" – they are all descriptions of Wiley Miner, recipient of the New Jersey Turfgrass Hall of Fame Award for 1978.

Miner was presented the prestigious award in December by the New Jersey Turfgrass Association in ceremonies at Expo '78 in Cherry Hill, N.J.

Founder and head of the Princeton Manufacturing Co., Miner has gained wide fame as an inventor of time and cost saving machinery and as a leader in the sod industry. His early years were spent on his family's Nebraska farm. The Depression deprived him of accepting an athletic scholarship to college, but the college's loss was agriculture's gain, for Miner soon developed an alfalfa dehydration plant and later invented the master stem crusher, a vertical hammermill used world wide today.

In the early 1960's, Miner headed East and started Princeton Turf Farms. His initial 18-acre venture soon expanded into one of the largest sod enterprises in the nation, to more than 2,500 acres in Missouri and Maryland.

He found time to invent and develop a revolutionary sod harvester. This machine, that graces many sod farms, is a machine operated by one man that will

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USE OF PELLETS FOR VEGETATIVE ESTABLISHMENT OF TURFGRASSES

By C.R. Skogley

Vegetative establishment of turfgrasses using stolons, sprigs or plugs has been practiced for many years. In northern regions of the United States improved selections of creeping bentgrass (*Agrostis palustris* L.) for golf greens and zoysia (*Zoysia japonica steud.)* for lawn or fairway usage are the grasses most commonly established vegetatively.

EDITOR'S COMMENT:
Our purpose in publishing this article is to stimulate some thinking on imaginative techniques for planting of prized turfgrass types. If pelletizing did nothing else than keep the stolons flat and in close contact with the soil, the technique could be worth a lot. Hopefully, this innovative study will stimulate further development on pelletized plantings of stolons.

Vegetative establishment (similar to reproduction using cuttings) is generally far more time-consuming and costly than seeding. The method has been and remains, however, the only way to reproduce turf of certain grasses that do not breed true, do not produce seed or produce very small quantities of seed. For vegetative establishment a considerable quantity of bulky, fresh, perishable plant parts must be used per unit area to be established. For stolonizing golf greens with creeping bentgrasses, for instance, ten bushels of stolons are used per 1000 square feet. Once harvested, stolons, sprigs or plugs must be handled rapidly in order to avoid loss of viability through heating or desiccation.

This study was undertaken to investigate the possibility of establishing grasses vegetatively by planting stolon or sprig pieces in pellet form. The feasibility of storing these pellets containing plant parts or storing stolons or sprigs at low temperatures to increase the time from harvest to use was also investigated. Grasses used in these studies included three strains of creeping bentgrass (Arlington, Congression-

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Comments and Opinions

SHARPENING OUR FOCUS ON ANNUAL BLUEGRASS

Annual bluegrass (*Poa annua L.)* has been considered a weed for the past 50 years by most turfgrass experts and laymen. It has often been called "failure grass" when it dies during the hot summer weather. It has been considered to have a short root system, yet studies have shown that when annual bluegrass is grown under soil conditions similar to Kentucky bluegrass and creeping bentgrass, it roots as deeply and as profusely.

Much money, time and effort have been spent trying to rid golf course turfs of annual bluegrass in the cool season grass belt. Most such attempts have ended in failure. Many have resulted in the golf course superintendent's losing his job. In spite of all this, annual bluegrass still persists.

Failure grass? One needs to ask the question, "To what were the fairways, tees and greens originally established?" Kentucky bluegrass, red fescue or creeping bentgrass. Where are the non-failure grasses now? Gone! The annual bluegrass has taken over. Had the annual bluegrass not filled in when the non-failure grasses left for parts unknown, you might be playing golf on bare ground. It is hard to comprehend how annual bluegrass can be singled out as failure grass when the "desirable" species (non-failure grasses) have failed to remain.

The problem of learning to successfully grow annual bluegrass (*Poa annua)* is one of education or retraining. It has been considered an undesirable weed for so many years that it is hard for people to accept it as a desirable turfgrass. It is not a weed and, if managed properly, provides a satisfactory turf in many areas of the cool season grass belt. Many golf course superintendents either refuse to admit they have any annual bluegrass or deliberately underestimate how much they have.

The stigma attached to annual

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EDITOR'S NOTE: I was enjoying and agreeing with this annual bluegrass article, then the words seemed to say there is nothing wrong with annual bluegrass. It is a good thing annual bluegrass cannot hear or talk. All the things said about it would cause it to spew its frustrations along with its failures. How would you like caring for frustrated annual bluegrass all summer? Seriously, all the things said about this grass tells us that deciding to combat it or live with it is difficult.

Blaming university educators for the continued stigma against annual bluegrass is selective "vision." While I know some university personnel have professed bitterness and total unacceptance of this grass, many golf course superintendents are the most vocal and adamant group in calling it a "_____" weed or something else. Now look how good I am. For years I have been telling students that annual bluegrass is our most dominant and persistent grass for closely cut turf, a moist habitat and heavy traffic.

On behalf of annual bluegrass and the article of comment, annual bluegrass is far less of a failure grass than it was 25 and 50 years ago.

Thanks to a better array of fungicides, better irrigation systems and well-informed superintendents. For those who might choose annual bluegrass, satisfaction is more likely with gentle summers and winters. Frequent and serious failures still occur on annual bluegrass areas that have severe hot or cold weather stress. Not accepting annual bluebrass in these areas is justified.

While many have failed to grow the bentgrass they would like on their golf course. I would remind that this grass is the major grass component of most putting greens of the Northeast. This is another place where annual bluegrass is unacceptable.

In summary, there is need for discrimination on accepting or rejecting the advances of annual bluegrass. With additional knowledge from research, we will further reduce failure of annual bluegrass and make it acceptable on more turf areas. Since seed production of annual bluegrass is scarcely feasible, what will we do when annual bluegrass is wanted? Seeding bentgrass for temporary turf, overwatering and overfertilizing to convert to annual bluegrass may sound like a bad joke; but it will bring annual bluegrass.

—Ree

Overheard

It is wonderful that we are worrying about food quality rather than where our next meal will come from.

Things To Come . . .

In December, Congress passed certain amendments to FIFRA, now referred to as the Federal Pesticide Act of 1978. The amendments are spelled out in the Federal Register, Friday, January 19th, beginning on page 4352. It may take a while to implement the changes on the Federal level, and still a longer time on the State level. When the implementation date occurs, the following are pertinent to turfgrass:

Remember the silly law stating that it is a violation to use a pesticide at lower rates than recommended on the label? Well, that will not longer be a misuse.

Remember that it was a violation to use a product for a pest that is not on the label? That will no longer be a misuse, provided the product is specified for use on that particular crop. It is still a misuse to apply a product to turf, if the turf crop is not on the label.

The new act will allow tank mixing of chemicals within certain guidelines.

States will be allowed to permit experimental uses of products without going to Federal EPA.

Still a problem of concern is the use of ULV applications of pesticides. ULV stands for ultra low volume sprays encountered in aerial or mist blower applications. Even though you are spraying the exact rate of pesticide per area, if you are using less volume of water than recommended on the label, this is a violation. You can apply

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Annual Bluegrass

bluegrass came from university educators who were convinced it really was a weedy annual grass which died from high temperatures during summer heat-stress periods. Because of this attitude, little research has been done on cultural aspects, disease problems or insect problems of annual bluegrass for fear of being burned at the stake as a heretic or put away in a padded cell. Research was done instead on Kentucky bluegrass and creeping bentgrass, which very few people actually have on their golf courses, and the results of these experiments were transposed to annual bluegrass. More often than not the techniques did not work.

Annual bluegrass is the largest single component of golf courses 10 years old or older in the northern region of the cool season grass belt. Although most people would not admit having it, it has been successfully grown on golf course greens for years, mainly because pest control programs have been practiced on the greens, just as such programs have been neglected on the fairways.

— GROUNDS MAINTENANCE — NOV. 1978

Things to Come

(continued from page 2)

to EPA for a permit and may receive it. They now have authority to grant it, but without the permit you are subject to a violation. Thus, presence of the very useful mist blower will still attract attention.

Speaking of violations, the fines will be reduced. For a minor misuse, a warning will be given. For a major misuse the maximum fines are now $500, first time and $1000 the second time.

New Jersey DEP inspectors are now empowered to inspect a premise or a turfgrass area carrying Federal EPA credentials, and they can not only impose a State penalty, but also turn you into Federal EPA for a second Federal penalty.

A word of caution. Until these amendments are implemented you must abide by the old rules and regulations.

—Paul Sartaretto

You never get a second chance to make a good first impression.

— Bits and Pieces

A note was sent out by a Turfgrass Specialist instructing lawn owners, "Don't fertilize the lawn in heat." Back came a letter asking, "How do I know my lawn is in heat?"

GRASSLANDS IMPORTANT TO ECONOMY

A representative of the fertilizer industry has pointed out that Britain's grasslands can be as important to the national economy as the North Sea oil now being pumped.

John Farmer, technical services manager, UKF Fertilizers Ltd., speaking at a recent grassland demonstration, pointed out that already the annual output from farming land in Britain exceeds 5,000M pounds sterling, making it the largest single industry in the island's economy.

He said that this figure could be dramatically increased with more attention to grassland which is still underused, underfertilized and undervalued. He said grassland production accounts for half the total output of the farm industry, and its output could be increased by half as much again.

Sound familiar? And this is another of our already developed countries!

From Farm Supplier, Aug., 1978.

RED TAPE MUST BE CUT

The average elapsed time from discovery to first full registration of pesticides in the U.S. last year was 110 months, almost 10 years! Fortunately, outside the U.S., the time lag has been somewhate less, averaging 76 to 85 months. Cost of developing a single new pesticide is now estimated at upwards of $20 million and heading higher. If costs continue to rise and the regulatory snarls to increase, the number of companies engaged in research is certain to be drastically reduced.

—Farm Chemicals

FOR HARD TO CONTROL INSECTS

R.P. Tomasello is 70 years old, and has been in the pest control business in south Florida for 50 years. When you ask him about the status of the lawn care industry in the region along the Atlantic coast from Miami north to West Palm Beach, where he is located, he says:

"There are more companies than insects down here. There are so many companies, about the biggest danger an insect faces down here is being run over by a pest control truck."

—Lawn Care Industry

There are few, if any, jobs in which ability alone is sufficient. Needed also are loyalty, sincerity, enthusiasm and cooperation.

VEGETATIVE

(from page one)

al, Berkshires), velvet bentgrass (*A. canina* L.) Kingstown variety, and Meyer zoysia.

Stolons were chopped into one-half to three-forths inch lengths, coated with powdered gypsum to prevent drying, and incorporated into the following mixture:

Sphagnum moss	2 parts
Corn starch	1/10 part
Raw gelatin	1/10 part
Vermiculite	1/10 part
Water	to reach a doughy consistency

The mixture plus stolons was extruded into cylinders about one by one and one-half inches. Each pellet contained from five to ten stolon pieces. Ends of some stolon pieces protruded slightly from the pellets. After pelleting, the pellets were air-dried for a few hours. The surface of the pellets as they were handled and transported was firm and dry enough to permit easy handling. The mass of the embedding body was considerably greater than that of the enclosed vegetative material. With the bentgrasses, approximately two bushels of stolons were contained in the volume of pellets thought necessary to plant 1,000 square feet. This would be about one-fifth the volume of stolons generally used.

The pellets were hand-broadcast on prepared seedbeds on August 5, 1960. Pellets were counted before broadcasting to obtain spacings approximately three, five and seven inches apart. Plot size was five by six feet and three replications were included in a randomized block design. The pellets were lightly rolled into the surface following broadcasting and the soil was kept moist by light, daily watering. For comparison purposes each of the grasses was also planted in the conventional manner. Arlington, congressional and velvet bentgrass stolons were broadcast at a rate of ten bushels per 1000 square feet; Berkshires sprigs were set eight inches apart; and two-inch zoysia plugs were established on twelve-inch centers.

A light hay mulch was applied to one-half of each plot to determine its possible value for moisture conservation in such plantings.

Within two weeks counts were made of the number of pellets producing some growth. The figures were: Arlington, 96%; Congressional, 94%; Berkshires, 80%; Kingstown velvet, 53%; and Meyer Zoysia, 50%. It was quickly noted, however, that the rate of ground cover development was much more rapid with the freshly planted stolons than from the pellets. It was thought that this might be due to possible reduction in viability of stolons in the pellets. Ten days had elapsed between harvesting fresh stolons, pelleting and planting the pellets, while stolons established in the normal manner were only 24 hours old.

Despite this error, estimates of turf stand nine months after planting demonstrated that plots planted with Arlington, Congressional and Berkshires creeping bents at the three-inch spacing showed coverage as good as, or better than, that obtained using the standard sprigs or stolons. The seven-inch pellet spacing was inadequate and five-inch spacing was intermediate.

MINER IN HALL OF FAME

(from page one)

harvest, palletize, cross tie sod pieces, automatically count drop the fully loaded pallet and replace it with a new pallet – at a rate up to 27,000 square feet per hour. He founded the Princeton Manufacturing Co. to produce the machine.

He spearheaded a Sod Certification Program that was implemented by New Jersey that assures consumers they are getting weed-free sod. He was instrumental in organizing the Cultivated Sod Association of New Jersey, serving as its first president, and helped organize the American Sod Producers Association, serving as its second president. And, of course, he helped develop the New Jersey Turfgrass Association.

Establishment of velvet bentgrass and zoysia with pellets was not satisfactory. In this trial all three creeping bentgrasses differed significantly from one another in average percent cover attained. Arlington producing the most ground cover and Berkshires the least.

It became evident that pelleted stolons of certain grasses would establish complete stands of turfgrass but the question remained whether such coverage could be attained quickly enough to be of practical value. Two additional trials were established in 1961 using the three creeping bentgrasses with pellet spacings of three, four and five inches. The first trial was started on June 15 and was similar to the 1960 trial except for the application of ten quarts of topdressing soil per five by five plot after rolling.

An identical trial was established on September 6, 1961. In both 1961 trials stolon and sprig material used in pellets, or as standard, were harvested at the same time. As in the previous years, trial ground cover from pelleted material was considerably slower than from fresh stolons. With stolons or sprigs, nearly complete cover was obtained in each trial within three to four months, while nine to twelve months were required for comparable coverage from pelleted material.

A study was done on the September 1961 trial to determine the number of shoots produced per square foot by the different planting methods. With pelleted stolons or sprigs, the number ranged from 10 to 32 shoots, depending on pellet spacing. For regular stolon planting the range was 135 to 162 shoots per square foot. From these counts it was determined that there was an average of 1.7 shoots per pellet.

In an effort to determine the possible number of reproductive sites (nodes) on the stolons used, counts were made on fresh Arlington stolons and from stolon material removed from pelleted Arlington stolon pieces. It was determined that when using the ten bushel per 1,000 square-foot rate of stolons approximately 2,000 nodes per square foot were planted. With three-inch spacing of pellets the rate was 420 nodes per square foot. This confirmed the estimate that at

the three-inch spacing of pellets only one-fifth the amount of stolons normally employed was being used.

Knowing the approximate number of nodes planted using each planting method and having taken counts of shoots produced, it was possible to determine relative efficiency. The "take" was found to be almost seven percent for both pellets and stolons of Arlington creeping bentgrass.

Additional studies were performed to determine whether pelleted and normal stolon viability could be prolonged by storage at low temperatures. Table 1 presents data obtained following cold temperature storage of pellets for a three-month period.

Table 1. Growth under greenhouse conditions of fresh pellets and pellets after storage at three temperatures for three months.

*Pelleted**	*Storage temperature (°F)*	*Percent growing after 10 days (%)*	*Percent turf cover after 6 wks. (%)*	*after 12 wks. (%)*
	fresh pellets	97	65	100
Berkshires	40	80	10	65
	32	30	5	55
	28	0	0	0
Arlington	40	55	10	30
	32	30	1	10
	28	0	0	0
Congressional	40	65	25	70
	32	40	10	40
	28	0	0	0

**Velvet bentgrass was included but failed to survive storage.*

As shown in the table, viability decreased during storage as temperatures decreased. Also Berkshires and Congressional creeping bentgrasses appeared somewhat more tolerant of prolonged cold storage than did Arlington.

Additional tests were performed to determine the effects of different temperatures and storage intervals on the respiration rates and regrowth potential of creeping bentgrass stolons.

Arlington stolons which had been grown in greenhouse flats were divided into 20 samples. Each sample was the weight required to plant a 14 by 20 inch flat at the ten bushel per 1,000 square foot rate. Each sample was moistened and placed in paper bags. The bags were then divided into four equal lots and kept in dark storage rooms at Fahrenheit temperatures of 70, 50, 40 and 32. Stolons were moistened routinely to prevent drying.

At invervals of two, five, ten and fourteen days, samples were removed from each storage room and planted in soil in greenhouse flats. After the same intervals, portions of the fifth sample at each temperature were removed for determination of respiration rates. Oxygen consumption was the criterion used in respiration determinations, using standard manometric technique with a Warburg Constant Volume respirometer.

Estimates of percent cover developed on the flat 25 days after planting are shown in Table 2.

Fresh stolons which had not been subjected to storage were planted in the same manner and after 25 days showed 65 percent cover of the flat and had produced 180 plants per square foot.

Table 2. The regrowth of Arlington creeping bentgrass stolons after storage at four temperatures for four time intervals (25 days after planting).

	Storage temperature							
	70°F		50°F		40°F		32°F	
Days stored	Plants/ sq. ft.	% Cover	Plants/ sq. ft.	% Cover	Plants/ sq. ft.	% Cover	Plants/ sq. ft.	% Cover
2	144	70	162	70	225	75	144	73
5	135	50	144	45	171	65	126	60
10	9	1	0	0	135	60	126	55
14	0	0	0	0	144	55	108	55

The respiration rates of stolons stored at the four temperatures for the four time intervals are shown in Table 3.

Table 3. Oxygen consumption by Arlington creeping bentgrass stolons after storage at four temperatures for four time intervals.

Days	*Average oxygen uptake (ul/sample) at different storage temps.**			
stored	*70°F*	*50°F*	*40°F*	*32°F*
2	143	129	110	66
5	112	76	102	76
10	91	77	80	89
14	52	56	89	87

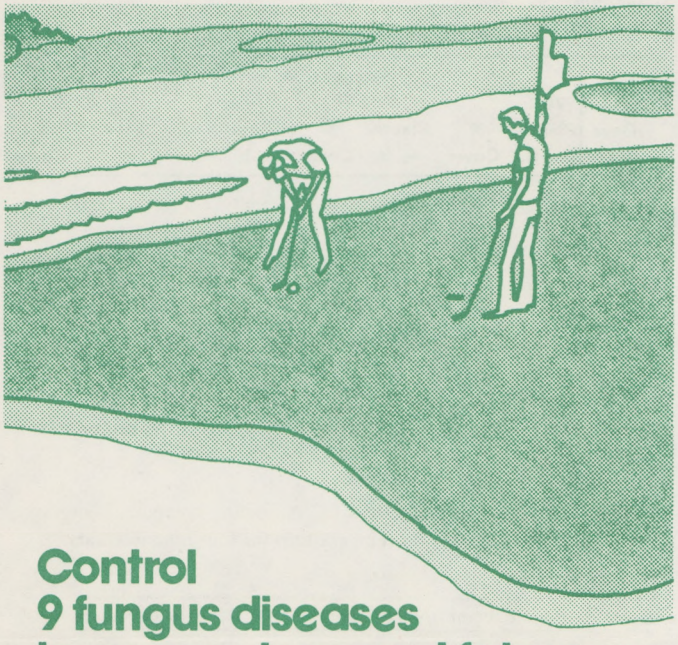
**LSD at 5%, temp. = 17.3; days stored = 13.7*

Reduction in respiration rates with increasing time in storage was much greater at the higher temperature levels. At the lower temperatures, respiration rate remained nearly constant throughout the two-week period. This fact would indicate that stolons might be kept viable for several weeks after harvest if maintained at temperatures from 32*t* to 40*t*F.

There are occasions when vegetative establishment of cool season grasses is required or desirable. This study has provided possible leads to additional methods of handling and planting stolons. Information obtained regarding cold storage of stolons to prolong viability following harvest should also prove of value.

*From a thesis submitted by Jane Anne Burke in partial fulfillment of the requirements for the degree of Master of Science Agronomy. University of Rhode Island, 1962.

The pellets used in this study were obtained through the cooperation of the Lawn Grass Pellets Co. of Houston, Texas.



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