



A FAIRWAY IN MY HANDS

By Monroe S. Miller

Seeds have become real important in my job the last year or so. I've probably used more seed in the recent months past than I have in my entire previous years as a golf course superintendent. One reason for such consumption was exciting — new construction! The other heavy use came in dealing with a tragedy — a Wisconsin winter that was more severe than usual. One seeding was frosting; the other was salvation.

Pat and I were getting ready to seed the new features of our golf course project last fall when I was running my hands through the bentgrass seed we were going to use. My first thought was to not spill any — “this seed is like gold”. Then, in a more reflective moment, it occurred to me that with such small seeds I could almost literally hold a fairway in my hands. Not quite, but almost.

It's an old trick in our business — diluting bentgrass seed with Milorganite to provide more even and more accurate seeding rates. We were doing that and for the first time in years my memory retreated to the times in my youth when we inoculated alfalfa seed before sowing it in the springtime. Usually an abiding *Rhizobium sp.* bacterial community exists in the soil, even after crop rotations on southwestern Wisconsin slopes.

Those rhizobial organisms are the ones that form a symbiotic relationship with the alfalfa roots and this team of plant/bacteria carries out N_2 -fixation, providing enough for the alfalfa's prosperity plus a little more. Rather than chance their absence, most farmers mixed the rhizobia with the alfalfa seed immediately before planting it simultaneously with the oat crop. Actually, most farmers had their kids do the mixing (in a bushel basket) right before it was needed in the grain drill. Mixing the bentgrass seed and Milorganite was a lot like that. From what I understand, the inoculation process is long a part of history and now farmers are able to purchase alfalfa seeds with an inoculant coating with a guaranteed

shelf life. Progress is a great thing!

I had transferred the grass seed from the lined burlap bags into a bushel basket. We needed to remove the plastic liners so the seed could be soaked in the burlap. I plunged my arms into that clean and cool seed. As I looked closely at those mysterious little seeds, I had a vision of thousands of acres of grass covering golf courses all over the country, giving pleasure to untold numbers. Their roots held soil in place; their leaves gave communities fresh oxygen to breathe; their existence made our existence happier and healthier.

It may be an overstatement to call these visions religious experiences, but they were at least pleasant thoughts and lofty dreaming. That ecstasy was followed by doubt. Will it grow? Will the rains come after a summer of drought? Will the rains come too fast and too hard and ruin our good work? Will there be the clear and warm days that are needed also? Yet despite the questions and doubts, I imagined the grass growing and the mowers cutting and the golfers playing. It was a fantastic picture, worthy of all the prayers over the weeks following seeding.

Wisconsin has a strong seed history. Although that doesn't include grass seed production, it does include seed production for a lot of other agricultural crops. And it includes a history of some of the earliest seeding equipment (and some of the best) in the world. Most have heard of the famous Van Brunt seeders and grain drills made in Horicon. Daniel and George Van Brunt invented the broadcast seeder and the grain drill. They built their first seeders in Horicon in 1861 and continued to do so until 1911 when they sold out to John Deere. Deere still operates that factory today, building grass maintenance machinery instead of seeders and grain drills.

More familiar to modern day landscapers is the Brillion Company. Their grass seeding equipment is in a league all its own throughout the world. The company name is also the town where

the machinery is made here in Wisconsin.

Students at agricultural colleges are exposed to many of the earliest experiments in plant science and soil science. Most are familiar with the names of Joseph Priestly, Jan Baptista van Helmont and Gregor Mendel and their experiments. Less known, but at least as interesting, is the work of one W.J. Beal. Professor Beal conducted some very interesting experiments with seeds.

Beal was on the faculty at the Michigan Agricultural College (called Michigan State University these days) during the last quarter of the last century. In August of last year, during a trip to a wedding in the Detroit area, I visited the MSU campus. I wanted to tour the Hancock Center (their turfgrass research facility) and I needed to visit the USGA Turfgrass Information Center and the Noer collection of books there. During my visit with Peter Cookingham, Director of the TGIC, I brought up the subject of Professor Beal. Peter promised to do some searching as his time permitted. When I saw him at the GCSAA Conference in Anaheim, Pete gave me an envelope of material about Beal and his work.

Beal's experiments were focused on seed dormancy — “vitality of seeds”, as he called it. If the seed is the culmination of a plant's reproductive process that began with a flower, then a natural question that follows is “how long do seeds remain viable?”

In a paper read before the Society for the Promotion of Agricultural Sciences' 5th annual meeting in Philadelphia on September 1st and 2nd, 1884, Professor Beal described his experiment this way: “In the fall of 1879, five years ago, I began some experiments, hoping to add something to the information we now possess on this subject (of seed vitality). I selected 50 seeds of each of 23 different kinds of seeds of common plants. I prepared 20 lots of these seeds all alike. Each lot or “set” of seeds was well mixed in moderately moist sand, just as it was taken, from 3 feet below the surface, where the land had never been plowed. The seeds of each set were well mixed with the sand and placed in a pint bottle, the bottle being completely filled and left uncorked and placed with the mouth slanting downward. The bottles were buried about 20 inches be-

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low the surface of the ground on a sandy knoll."

For the first 40 years after 1879 one bottle was dug up every 5 years and the seeds were tested for viability. From the 40th year onward, Beal's successors have tested the seeds every 10th year. Below is data through the first 70 years:

	YEAR										
	5th	10th	15th	20th	25th	30th	35th	40th	50th	60th	70th
White Clover	0	0	0	0	0	0	0	0	0	0	0
Fireweed	0	0	0	0	0	0	0	0	0	0	0
Common mallow	+	0	0	+	0	0	0	0	0	0	0
Common mullein	+	?	+	+	0	0	+	0	0	0	0
Common chickweed	+	+	+	+	+	+	0	0	0	0	0
Shepherd's purse +	+	0	+	+	+	+	0	0	0	0	0
Rough pigweed	+	+	+	+	+	+	+	+	0	0	0
Peppergrass	+	+	+	+	+	+	+	+	0	0	0
Evening primrose	+	+	+	+	+	+	+	+	+	+	+
Yellow Dock	+	+	+	+	+	+	+	+	+	+	+

The longevity of seeds buried in soil. + indicates germination of one or more seeds; 0 indicates no germination.

In 1970 after 90 years of dormancy, seeds of only one species — *Verbascum blatteria* or moth mullein — were viable. Ten of the original seeds in the bottle buried by Beal in 1879 germinated.

An interesting historical sidelight: Peter wrote to me, "A colleague here in the MSU library (the Agricultural Librarian) says he knows 'the exact' location of the sandy knoll where Professor Beal buried the seeds for his experiment so if you stop by again perhaps we can arrange a 'field trip' (about 300 feet from us here)." I will make that trip again someday to see where this intriguing test of seeds took place.

The trend among golf course superintendents to pre-germinate seed probably has something to do with my renewed interest in seeds, too. It makes the subject of longevity especially fascinating. The oldest authentic case I've been able to read about were 2000 year old lotus (*Nelumbo nucifera*) seeds found in peat near Tokyo. They are enclosed in a hard shell nearly impervious to water. The seed coat almost has to be ruptured before the seed will germinate. Despite the passage of 20 centuries, plant life came from that seed. I wish I had similar confidence in a 4 year old bentgrass seed!

Other than agriculturalists and maybe gardeners, most Americans probably don't give seeds a passing thought. Until this past March, at least,

Most of the nation's daily newspapers carried a 3-part AP expose entitled "SEEDS OF CONFLICT". Its subject was the seed reserves of our country and policies affecting them.

It was frightening to read. The conditions uncovered by AP reporters drove many like me into a rage. Underfunding, bungling, incompetence and

neglect by, as usual, politicians and bureaucrats have imperilled the future of U.S. agriculture.

There is a golf course connection here, a personal one for those who attended the GCSAA Conference last February, that goes beyond our own obvious use and need of seeds. One of our speakers (and one of our friends), Rep. George E. Brown Jr., is mad as hell, too. As a member of the House Agricultural Committee, he plans on doing something about the terrible state of affairs of our seed reserves. He called the U.S. germplasm (seed) system "lousy, measured against the importance of the problem."

The California representative is chair of the subcommittee which oversees our germplasm reserves. He is upset over embargoes by the State Department which restrict free exchange of seed. He called them "an example of that age-old adage, 'There ain't no damn reason for it; it's just our policy.'"

This seems a disturbing note to leave a sentimental story on. Even seeds are politicized; they are more than a simplistic "fairway in my hands" or Dr. Beal's experiments on vitality. They are more than Johnny Appleseed or inoculated alfalfa.

But wait: we don't have to see them through the eyes of the politicians, the greedy or the power mongers. Read Muriel Stuart's words — she enjoyed

the thought of a forest, a meadow, a garden in her hand:

*Here in a quiet and dusty room
they lie,
Faded as crumbled stone or
shifting sand,
Forlorn as ashes, shrivelled,
scentless, dry —
Meadows and gardens running
through my hand.*

*Dead that shall quicken at the
call of Spring,
Sleepers to stir beneath June's
magic kiss,
Though birds pass over
unremembering,
And no bee seek here the
roses that were his.*

*In this brown husk a dale of
hawthorn dreams,
A cedar in this narrow cell is
thrust
That will drink deeply of a cen-
tury's streams,
These lilies shall make summer
on my dust.*

*Here in their safe and simple
house of death,
Sealed in their shells a million
roses leap;
Here I can blow a garden with
my breath,
And in my hand a forest lies
asleep.*

1988 DROUGHT TAKES TOLL ON BRIGGS & STRATTON CORP.

The drought of 1988 has hit Wisconsin's largest private industry employer. In early June Briggs & Stratton laid off an additional 300 production workers. They join 700 previously laid off employees. The layoffs are due to a lack of engine orders. That reduction in orders of small engines for lawn mowers and turf maintenance equipment is due to last year's drought. The drought cut into lawn mower sales and led to inventory buildups.

It is believed that for the first time ever, this major Wisconsin manufacturer will lose money for fiscal 1989 which ends this June 30.

However, improved sales prospects look good for this summer because retail and commercial sales have been doing well. Increased rainfall is primarily responsible for this improvement.