



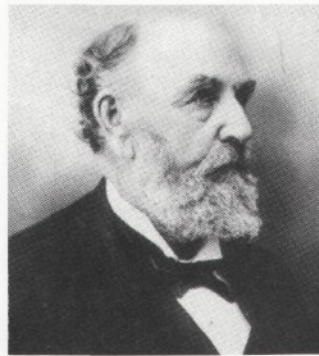
The Deere On The Edge Of The Marsh



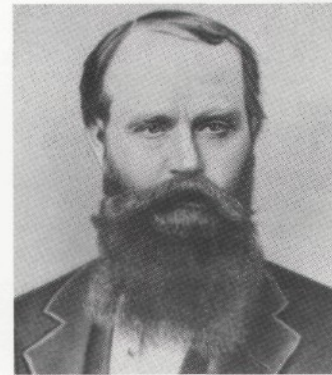
Made in Wisconsin



John Deere



D.C. Van Brunt first started his grain drill business in Mayville and then moved to Horicon.



George Van Brunt carved the first model of a seeder in 1860.

JOHN DEERE HORICON WORKS

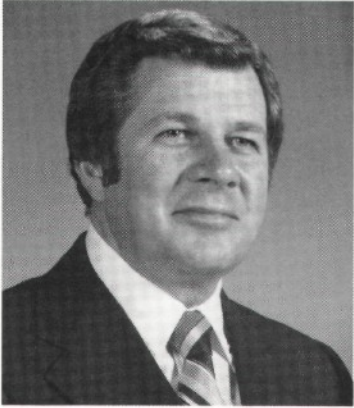
By Monroe S. Miller

Lyle Zweber stopped by on a dreary and wet day last fall. He was in the Madison area for the Wisconsin Farm Progress Days, putting together the Deere and Company equipment display. He broke away for long enough to have lunch with Jim Hofmeister and me over at the Irish Waters. It was then I spilled to him my hopes of arranging a tour of the John Deere plant in Horicon. Really, John Deere is lucky to have people like Lyle representing them. He's a nice mix of business executive and agriculturalist - he knew why I wanted to get an inside look at the factory I'd driven by any number of times and he wanted to make that happen for me. He had been enjoying the "Made in Wisconsin" features up to that time and knew his company had a chapter in the story of Wisconsin's dominance in the manufacturing of turfgrass equipment for the rest of the world.

Jim Hofmeister and I left Madison for the trip to Horicon while it was still dark. Instead of the wet and dreary day of last fall when the trip was conceived, he and I were greeted by a cold but bright February day, the kind that makes you ache for spring. I did some daydreaming on the way there. The thought occurred to me that this story about John Deere and his company really started thirty years ago on our Grant County dairy farm. Farm kids in

country schools are always arguing about something. Usually it was over the best breed of cattle - I always liked Brown Swiss and Guernsey, and in Holstein country like Wisconsin I found myself in some furious debates. The other thing we argued about was tractors. There were fierce discussions about which ones were the best, which had the most power, which were the easiest to work on. We had Ford and Oliver, and I fought tooth and nail for their good names, giving in to no one and no other tractor.

Well, almost no other tractor. For all the time I remember I have been intrigued by John Deere. Early in the spring, before the leaves were out to dampen sounds, you could hear the familiar pop-pop-pop-pop of John Deeres from farms away, plowing ground in preparation for the sowing of oats. They were such distinctive tractors - the sound of their two cylinder engines was fascinating. And they always looked "empty"; there wasn't much to them because of the smaller size of a two cylinder engine and yet they had pulling power equal to other tractors their size. Maybe they seemed a little strange because of their large flywheel and the substantial frame of the tractor. Or maybe it was the hand clutch they used that many other tractors did not. Whatever it was, I never passed on a chance to drive a John Deere tractor. I really liked them.



Raymond E. Gregg, Jr.,
General Manager of John
Deere Horicon Works.



Horicon is not only known for the John Deere products that are produced here, but for the Horicon Marsh and its natural beauties.



Primary operations were moved to Building 101 in 1976. The new facility gave the factory needed space in primary operations and downtown facilities for storage and assembly.

This year is an interesting one in which to write a story about John Deere's Company. They are celebrating their 150th anniversary. That has to make them one of America's oldest business firms. John Deere, interestingly enough, had his roots in New England. At times during his youth and early adulthood, John Deere lived in Rutland, Royalton, Middlebury, Leicester and Hancock, all Vermont villages and several which this author has visited. Agriculture in New England has always been difficult - brutal winters, stony soils and steep terrain and was particularly tough in the 1830's. Mr. Deere had suffered several business setbacks. It was in November of 1836 that John Deere, a blacksmith by trade and toolmaker of some renown, left Vermont for Grand Detour, Illinois to start over again.

Grand Detour is an easy trip from Madison and is located west of Dixon, Illinois, boyhood home of President Ronald Reagan. When Deere arrived in the village, he had a valuable asset for these new agricultural lands of America - his blacksmith trade. He was the only blacksmith for miles around Grand Detour and demand for his skills was great. It was here that he was to prosper and where, in the summer of 1837, he introduced to some local farmers around Grand Detour (and as it turned out, to the world) a new fangled plow. This implement was revolutionary because of a characteristic of the prairie soils of our country. In fact, anyone who has walked some of the fields on the UW's Arlington Experiment Station would know of this. They are rich and dark and extremely productive soils, but they are sticky. With even the slightest amount of moisture they adhere to almost anything, including plows of early design. Spring plowing was miserable and the early farmers of these lands had to stop every few yards and scrape the soil from the plow. John Deere saw this and fashioned from a highly polished old saw blade a moldboard plow that cut a clean furrow of soil without carrying that soil with it.

Construction of that plow by John Deere incorporated polished steel into the plow. His interest in polished metal went clear back to his Vermont blacksmithing days. He made hand tools and polished the tines of his handmade forks "until they slipped in and out of hay like needles" and his shovels and hoes "like no others that could be bought - scoured themselves of the soil by reason of their smooth, satiny surfaces". John Deere's career as an implement manufacturer was up and running. He stayed in Grand Detour until 1848 when he moved to Moline, Illinois. The Deere corporate headquarters are still there today.

I was totally unprepared for the discovery I made at the John Deere Horicon Works. I had mentioned, early in the morning before leaving Madison, to one of our janitors at the clubhouse that I was headed for the John Deere plant in Horicon. Will retired from farming in the Mt. Horeb area several years ago and he said to me, "So you're going up to see the old Van Brunt factory." That was the first I was aware that the facility had ever been anything but part of John Deere. I learned later that day how significant the Van Brunt line of equipment has been to American agriculture over many years.

Daniel and George Van Brunt were very nearly contem-

poraries of John Deere. Whereas Deere's initial contribution to the farmers of the world was the self-scouring plow, the Van Brunts gave agriculturists of our country and the world seeders and grain drills. These two brothers first invented the broadcast seeder and then invented the first seeding device to help farmers solve the problems of birds, wild pigeons in particular, eating seed applied to prepared ground. That fundamental design by the Van Brunts is still used on modern day grain drills. They built their first seeders in Horicon in 1861 and continued to do so until 1911 when Van Brunt officials signed an agreement to sell their assets to Deere and Company. Deere needed to provide their dealers with grain drills to meet the enormous demands from farmers and it was decided the best way was to own and operate their own factory. They decided to buy the best and became owners of the Horicon plant and the Van Brunt line of equipment. Part of the agreement between the Van Brunts and the Deere Company was that the factory would remain in Horicon and the employees retained. Deere wisely agreed.

The years following the purchase saw Deere making continual changes, improvements and additions to the facilities. The factory continued making the Deere line of grain drills and seeders, and over the years cultivators, tillers, lime and fertilizer spreaders, grass seeders and utility trailers were added to the line of products made in Horicon. In 1947 the company name was changed from Van Brunt Manufacturing to John Deere Van Brunt Company. The number of employees at the plant in the 1940 to 1949 period varied from 400 to 650. Another name change took place in 1958 - from John Deere Van Brunt Company to John Deere Horicon Works, a name that is still in use today. Employment in the 1950's varied from 600 to 860.

Major changes started taking place in the 1960's at the Horicon Works. And they were changes that make this story pertinent to Wisconsin Golf Course Superintendents. The foundry that had been a mainstay for about one hundred years was shut down. The agricultural segment of our economy was in a slump in the early 1960's and a need for diversification of their product lines became evident. After earlier attempts by Horicon to convince corporate decision makers to enter the consumer market, Deere and Company officials finally decided, in 1962, to build a small lawn and garden tractor. It was the Model 110. Production began in April of 1963. Horicon, before building the first units, agreed to complete early engineering that had been done in Moline and to deal with field testing. Only 1,000 units were made in the first year. That number climbed to 10,000 in 1964 and has been rising dramatically since that time. So well done was the Model 110 that it received an "Award of Excellence for Achievement in Design" by the 1964 Industrial Design Exhibition. Jim Hofmeister has restored one of those first tractors and slowly is adding attachments that were made for it. Deere's success with this implement was accentuated when, in 1970, the Smithsonian Institute in Washington D.C. requested one of the first models for its museum display!

By the end of the 1960's, Horicon was nearing a total dedication to non-agricultural products. The grain drills



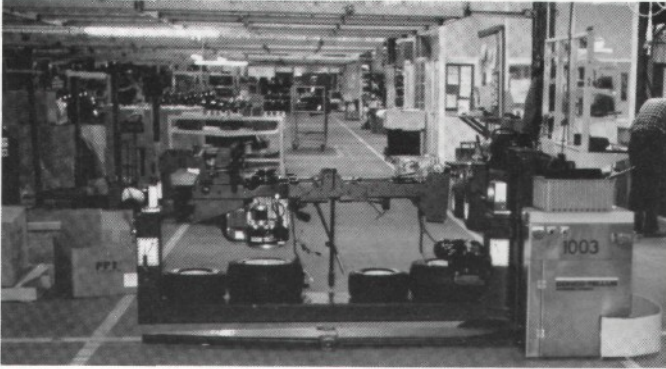
The heart of the focus factory - the AGVL. This one has come from the first island. Note white lines on floor - they mark the path the vehicles follows.



The AGVL robot is readied for a trip through the various assembly islands.



A work station at one of the assembly islands in the focus factory.



Side view of focus factory robot as it moves from one island to another.



A work station at one of the assembly islands in the focus factory.



Small tractors nearing the end of the AGVL.

which had been manufactured there for about one hundred years were being made in Des Moines. Product development was more and more oriented toward the consumer and recreational market.

Significant to the 1970's was the finished product list from Horicon. It included a wide range of small tractors, mowers, tillers, decks, snow throwers, snowmobiles and even bicycles. There was no agricultural equipment made there any longer. Also significant was the arrival, in 1970, of Raymond E. Gregg, Jr. He came as Sales Manager and was later named Factory Manager. In 1972 he was promoted to General Manager of the Horicon Works. He holds that position yet today, and has guided the company through many of these substantial changes in their mission within the John Deere corporate family. He originally came to Horicon with the intention of staying from one to three years. During that 1970 through 1986 period, Mr. Gregg has seen the value of products made in Horicon grow from \$60 million to \$600 million. 1987 marks his 30th year of service with John Deere.

Another discovery I was unprepared for was the enormity of the John Deere Horicon Works. Jim had warned me about it. "Be prepared for a real surprise," he cautioned over breakfast and coffee at the Golden Goose restaurant on Main Street. I've been through Horicon many times over the years and as you drive through on Highway 33 about all that catches your eye is the above-street crossover of the Deere plant. Even a drive by the factory on Lake Street doesn't really give a clue to the cavernous plant on the Rock River. We were greeted at the personnel office by Ellen Blanshan, a representative of the personnel department. She covered some preliminary things, showed us a video about the Horicon facility and then introduced us to Karl Eberle. Karl, an electrical engineer, is a General Supervisor. We left the street level office area, went down some enclosed stairs and opened the door to the part of the plant on the north side of Lake Street. I was, to say the least, startled. Jim hadn't been exaggerating. What opened before my eyes more resembled one of the GM plants around Detroit I've visited than a turf equipment factory. It is huge! It's impossible to see from one end to the other; it is also a scene of incredible activity.

The most salient features of the Horicon Works these days seems to be those of change and those associated with prosperity. They are extremely busy. Horicon is working three shifts per day for six days a week. That simply means they are going full throttle ahead for 24 hours a day, Monday through Saturday. Business couldn't be much better for them; they seem to be at full capacity right now.

Karl really got wound up as we went along. He's in charge of what John Deere calls a "focus factory". In Karl's case, they are building riding lawn tractors. This is a method of manufacturing that integrates all of the procedures of production - receiving, welding, assembly, shipping, etc. It has great appeal because of the efficiencies it offers - less material handling, lowered parts inventories, fewer employees, lowered production expense, reduced

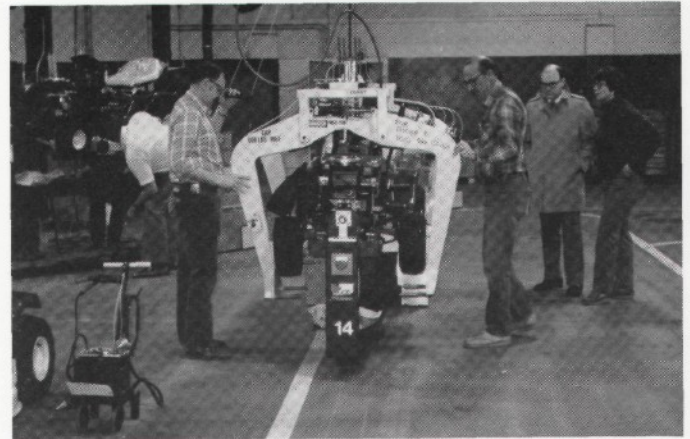
scheduling requirements and less direct supervision. Under this concept, each person knows *exactly* what their work is; they, in many ways, supervise and pace themselves. The bottom line, according to Eberle, is a better finished product at a more competitive price.

The Japanese have been doing this in their plants for a period of time, and Horicon has adopted and adapted the concept. Karl emphasized how imperative education and training are as they incorporate this new approach to building machinery. Such a drastic change requires integration of and cooperation between salary staff and hourly employees. Management offers a one week course that teaches "group problem solving" with the resources they have available. He mentioned the good relationship with the IAM union and how critical their help and cooperation has been as the Horicon Works moves away from the more conventional methods of manufacturing.

They have limited the size of the work force in the focus factory to around 400, a number they feel is good and a number that Japanese experience confirms. Anyone who has read previous "Made in Wisconsin" features now knows about "just in time" manufacturing. That concept is very evident everywhere at John Deere, but especially in the focus factory. They have established a four hour "cushion" between processes, allowing time to solve problems that inevitably crop up without stopping production. And yet, it is a short enough period to almost eliminate any major rework. They may keep parts for one or two days, but it is just as likely that raw steel unloaded in the plant in the morning is headed out of the plant that same day as an outfront rotary destined for a golf course. Just in time production gives them the ability to produce what is needed when it is needed, and eliminates a lot of waste and substantially changes the whole inventory scene. In fact, in the last four or five years, they have been able to reduce their raw materials inventory by about 70%. It does, however, require a great deal of coordination and planning. Engines might require an order lead time of six months. That means that Karl's people need to know exactly how many they will need on Tuesday, August 18th, 1987!

The just in time methods used by Deere places lots of responsibility on each employee, and they have responded. At every turn in the various areas of the plant(s) where individual parts are made you see machine operators and welders, for example, doing "on line gauging". They check the specifications for their own parts. This has reduced parts rejection rates to almost zero. And many finished machines are checked with computerized probes (deck leveling is an example I noticed) and measurements are confirmed in seconds.

Easily, the most fascinating part of the focus factory is the "automatic guided vehicle line". The space age arrived at the Horicon Works on December 8, 1986 when they started using these machines to make machines. The best way I can describe this is as the use of robots in assembly. I've seen welding robotics in almost all of my stops in reporting this feature - Horicon has many of them, too. But



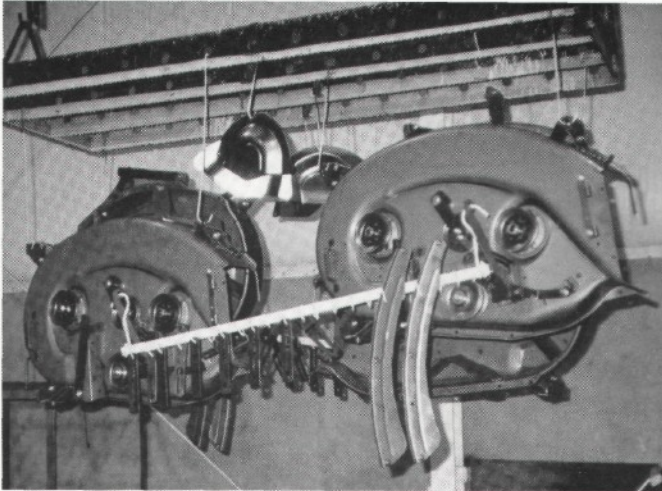
A completely assembled vehicle is tested.



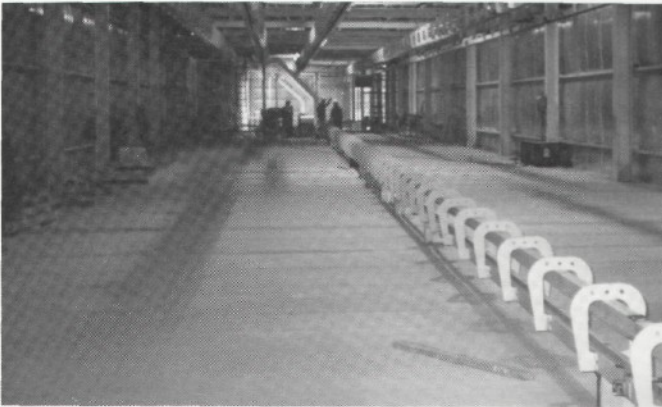
Each vehicle is covered with plastic which is heated for shrink wrapping.



The AGVL robot even loads the newly built vehicle!



Pieces headed for the paint booth go in as units as a result of the organization of the focus factory.



A view of the tunnel connecting the factory with the new \$24 million painting facility.



Karl Eberle, General Supervisor of the focus factory explains the new Horicon works painting operation that is near completion.

AGVL robots start with a naked frame member and move it through various islands until the machine is built and then they load it on a truck for delivery. This area of the plant is especially open, clean, quiet and bright. The robots are computerized and they are guided by wiring imbedded in the floor concrete. No one steers them; they are gentle as they move quietly about their work and will stop immediately if they touch anyone. On occasion, a manual override is used to recycle a machine or move it to an inspection area.

The AGVL moves from island to island. Each island has four stations although only two are currently in use. The robot stops as it pulls into an island station. Several employees then begin their work. Each person performs many different jobs on the vehicle under construction - putting wheels (tire and rim) on, pulling wiring through, attaching sheet metal, bolting down an engine, etc. The robot is programmed to present the product under construction in a certain way at an island - upside down at one, lowered at another - to make assembly as easy as possible. Really, they are the most amazing things to watch as they snake and glide around the plant until the tractor is crated, shrunk wrapped and loaded into a semi-trailer. It is interesting to note that this is the first non-automotive application of AGVL and they will have the capacity, once all four islands are operating at full capacity in June, to produce one rear engine riding mower *per minute!*

The AGVL is indicative of how dynamic the Horicon plant is. But the more conventional assembly lines are still in use as the plant undergoes change. Even they are somewhat nontraditional. For example, they can run seven different tractor models down the same assembly line. This ability to produce several pieces on the same line is called "homogenized production", and allows them to build all models everyday to meet dealer demand, again just in time. Another thing I noticed was the absence of "scrap carts". The metal left from stamping, boring, cutting and other basic procedures is deposited directly on a conveyor running beneath the factory floor. And just in time methods have required advances in quick change in tooling so they can rapidly move from one part to another in manufacturing. The tool room and die cleaning area is almost a story in and of itself - the way that tooling components are made and maintained is fascinating.

Quality and service are key consideration for Golf Course Superintendents when they are purchasing equipment. Quality is second only to safety at the Horicon Works. They have quality awareness task groups made up of employees who meet once a month to make recommendations to management. Ninety-five percent of their recommendations are applied. They have their own material testing facilities where engineers can cycle com-

ponents under full load and literally save years of field testing. They test finished products under hot and cold weather extremes that they can create in another test cell. I've already noted that employees shoulder a lot of responsibility in meeting specs as they go through their day. Computers are used to help at every turn.

Parts availability to end users has had a high priority, and they guarantee a 24 hour shipping turnaround and are proud of their 99% fill rate on parts. John Deere dealers have access to DTAC - a service information tool that they are tied to with a toll free telephone number. A call is made about a service problem and in ten minutes they are able to talk to someone in Horicon about a solution.

There are several ways to measure the size of an operation like the Horicon Works. One way is the value of finished product - \$600 million last year. Another is by the square footage of the company. The total occupied by all phases of the Horicon Works is 1,300,000 square feet - over 30 acres under roof! Most people do not realize that John Deere has a relatively new manufacturing facility on the edge of town - Building 101 as it is referenced. That plant does simple parts fabrication and some welding. Another gauge of size is payroll - Horicon employs almost 1,800 people in their operation. Yet another measure could be profitability; right now, the Horicon Works is John Deere's most profitable manufacturing operation.

A word about the painting facility that is currently being constructed gives hint to size. They are in the final building stages of a \$24,000,000 addition that will allow them to apply the finest protective and finish coats on their machinery that current technology can provide. It is very impressive. That addition alone covers almost 80,000 square feet.

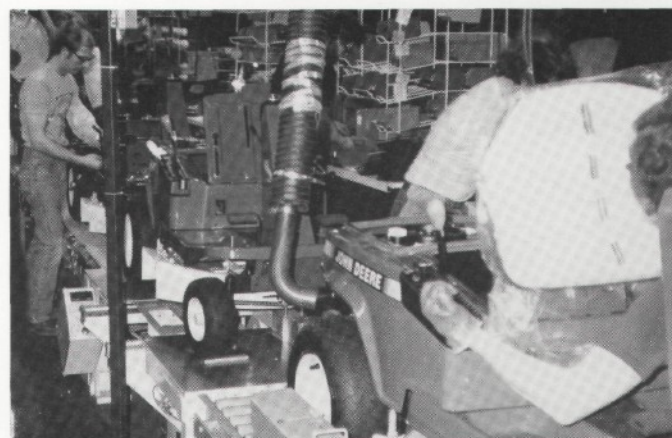
One hundred and twenty-five years is a long time to be in one place. Yet that is the history of the Horicon Works. Isn't it notable that during those many years they have been the largest producer in the world of grain drills and of lawn and garden tractors? That kind of success has to be attributed, to a great extent, to employees. This has been true wherever I've travelled in Wisconsin - hard working, dedicated and creative workers spell success, time and time again. John Deere feels most fortunate to be a benefactor of the efforts of these people.

It is much easier for me to now see and understand why John Deere is working toward a higher level of participation in the golf course business. They have seen success with similar equipment they've made in Horicon. I'm convinced we'll see other pieces being made there and moving onto our golf courses. After all, their motto is "Meeting Customer Needs."

And the John Deere Horicon Works really is making "something special from Wisconsin!"



A view of a part of the painting addition now nearing completion.



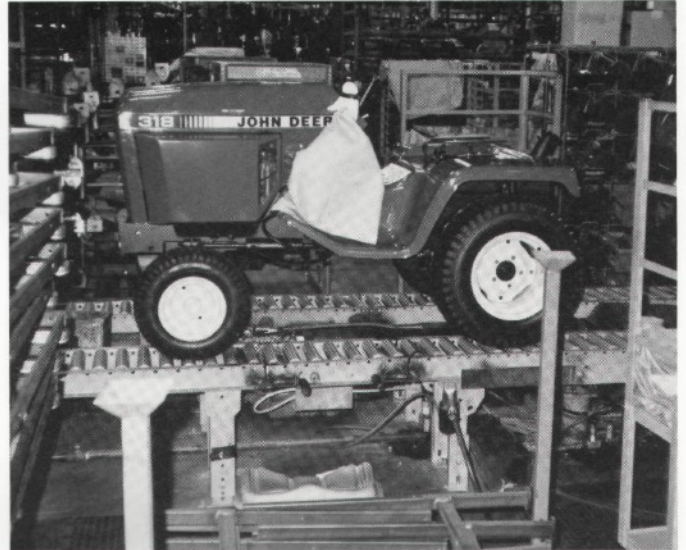
Every vehicle built at Horicon is run before it is shipped.



A conventional assemblyline of the John Deere Horicon Works. Here are John Deere 855 tractors under assembly.



Incredible activity at the Horicon Works — “organization” is a key to their smooth running operation.



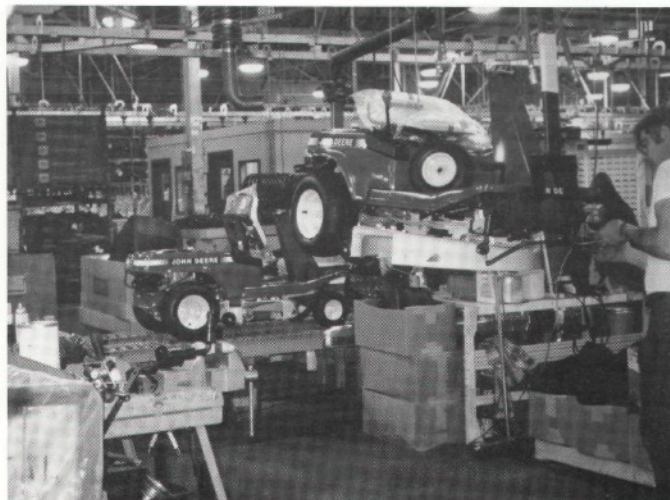
A JD 318 moves along a conventional assembly line.



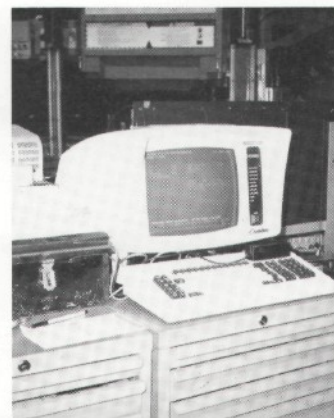
Words cannot describe the tremendous size of the John Deere Horicon Works - this is the first view the reporter had.



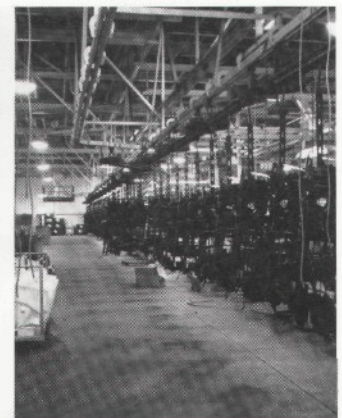
Mark Miller, general supervisor of Building 101, is in charge of the simple fabrication in that plant.



A rider is pulled from the line to correct a problem.



Computers are used everywhere—this is at a parts fabrication work station in Building 101.



Mower frames by the hundreds move toward assembly 24 hours a day, six days a week.

Something special from Wisconsin... John Deere turf care equipment

John Deere hydrostatic diesel utility tractors and front mowers are manufactured here in Wisconsin. By people who understand the meaning of productivity and value. They're designed and built for easy operation and season-after-season durability. See your dealer soon for details and a demonstration.

**See your nearby John Deere dealer
for quality equipment,
dependable parts and service support**

Hydrostatic diesel tractors are available in 16, 20 and 24 hp. Attachments include mowers, collection systems, snow blowers, loaders and more.

Front mowers are offered in both gas and diesel models with 50- to 76-inch mowing decks, collection systems, brooms, blades, snow blowers and throwers.



Nothing Runs Like a Deere®



(Continued from page 1)

will be more and more alumni establishing themselves on the regional and national level in the years to come.

The opening session concluded with another well-known Wisconsinite - Bart Starr. Mr. Starr presented the keynote address. His prominence in the National Football League as head coach and as quarterback of the Green Bay Packers certainly drew attention to the GCSAA Conference. Mr. Starr spoke with feeling and sincerity on the importance of making us aware of ourselves, our values and our goals in life. Someone might have expected stories on his life and experiences in the NFL, but a first class person like Bart Starr chose to highlight his speech with advice on "ourselves" and took himself from the spotlight. He limited his use of NFL references to those that emphasized his central theme.

The opening session concluded with an informal gathering outside the Civic Plaza with a band and favorite hors d'oeuvres and refreshments.

All day Friday was devoted to the Concurrent Educational Sessions, with another good lineup of speakers and timely topics. The general feeling was that there was something for everyone with substantial amounts of practical and informative education for attendees to take home and put to use.

Saturday morning saw the Golf Course Superintendents spend most of the day at the Trade Show. And what a show it was! If a product has even a slim thread attaching it to the golf course industry, it was there with a booth. And even at that, the rumor was

that about fifty other exhibitors wanted to buy floor space but were unable to because it was sold out. Sales, marketing and engineering staff were present for questions.

Speaking of the Trade Show, did you notice how many exhibitors had reprints from our newsletter, *The Grass Roots*, as a part of their handout material? I counted six! That was about six more than any other newsletter. I don't believe there could be any question concerning the amount of notoriety and good will this brings the WGCSA, as well as the local distributors who graciously buy ad space from us.

Once again, *Grass Roots* Editor Monroe Miller accepted an award from the GCSAA on behalf of the WGCSA for best overall newsletter. The award was presented at a luncheon during seminar week on Wednesday and he also received recognition at the opening session.

The Trade Show demonstrated a real Wisconsin flavor, too. Could you, or did you, count the number of exhibitors and manufacturers who had direct ties, if not headquarters and plants, in Wisconsin? I would guess it was well over thirty. The Trade Show added to the prevalent feeling that we were a driving force at the Phoenix show.

Sunday morning started off with the Major Speaker Sessions. Superintendents were given the choice of attending one of three prominent speakers who addressed us on "Time Management," "Goal Setting" and "Success on Our Terms." All of the sessions were well attended and appeared to be well



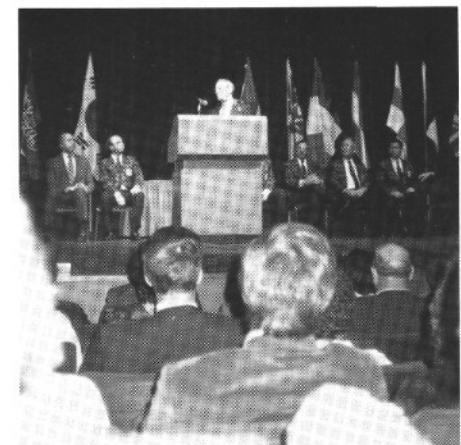
GCSAA Director Steve Cadenelli presents GRASSROOTS award to editor Monroe S. Miller.



Jim Love accepts the GCSAA "Distinguished Service Award" from President Stottern.



The 1987 GCSAA Scholarship winners. The UW-Madison's Mike Lee is seated on the far right.



Dr. Love gave an acceptance speech; notice how all are intently listening. He was back in the classroom for a fleeting moment!