

Dr. James B. Beard: A Leader in Turfgrass Science and Education

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Editor's Choice profiles individuals whose accomplishments in the 20th century greatly influenced the direction of the turfgrass industry at the beginning of the 21st century. In 1975, the TPI Board of Trustees designated Dr. Beard an Honorary Lifetime TPI Member as one who has "in a very significant way improved the industry."

Dr. James B. Beard was born September 24, 1935 in Bradford, OH, which is located north of Dayton, OH. He grew up on a farm that was home-steaded by his great grandfather. The farm was a livestock and crops operation. Working on the farm taught him a lot about work ethic and responsibility, as well as whetting his appetite to increase his knowledge and understanding of the discipline of agronomy. When Jim left home for college, his father sold the livestock and went to a crops only operation. Jim says his father also bought their first power lawn mower at that time.

Jim received his B.S. degree in Agronomy from Ohio State University, graduating Summa Cum Laude (i.e. with highest honors). His keen interest in plant science and his dedication to study developed in his undergraduate days set the tone for his outstanding professional career. He went from OSU to Purdue, where he completed his M.S. degree in 1959 majoring in Crop Ecology, and his Ph.D. in 1961 majoring in Turfgrass Physiology. Jim was the first individual to obtain a Ph.D. majoring in turfgrass physiology. His major professor at Purdue was Dr. W. H. (Bill) Daniel. While working on his Ph.D., Jim received one of the first National Science Foundation (NSF) Fellowships for graduate students. The NSF Fellowships are a highly sought recognition by individuals interested in science and are rarely rewarded to persons working in agricultural sciences.



Dr. James Beard (left) speaking with TPI past president John Hope of Canada. Dr. Beard spoke at the 1995 Midwinter Conference on "Turfgrass Advances in the 21st Century." Dr. Beard summarized his insights in the July/August 2000 issue of "Turf News."



Author Dr. Robert Shearman reports that few people know Jim Beard is an avid fisherman.



Dr. James Beard and his wife, Dr. Harriet Beard, at the 1999 TPI Summer Convention at MSU.

Jim married Harriet on March 20, 1955. They grew up on adjacent farms and went to the same church. They were married in the church they attended as youths. Jim's great grandfather built that church. They have two sons, Jim and John. Their

oldest son, Jim, is a golf professional at Briarcrest Country Club in Bryan, TX. Jim is married to Cathy and they have a daughter, Amanda, who is seven. John, their youngest son, is a massage therapist in Bryan while pursuing a degree in physical therapy. Those who know the Beards well know they have strong ties to their family. However, not many may know how strong a couple Jim and Harriet make. In fact, they are an outstanding team. They have worked and traveled together for most of their married years. Harriet has been a cornerstone for Jim's work activities outside the university setting. She serves as the home office and business manager. Throughout much of Jim's career, he extended his work into nights and weekends as he worked on books, grant applications, scientific manuscripts, popular articles and presentations. Harriet has always been there to assure the countless hours of dictation were typed and edited, and deadlines were met. Harriet is always with Jim, adding to the team concept of their relationship.

After completing his Ph.D. program at Purdue University, Jim started his career as an assistant professor in the Crop Science Department (later the Crop and Soil Sciences Department) at Michigan State University (MSU) where he rapidly moved through the ranks to become a Professor in 1971. In 1975, Jim accepted an opportunity to continue his professional development as a professor in the Soil and Crop Sciences Department at Texas A & M University (TAMU). It was not an easy decision for Jim and his family. They had strong ties to their friends and colleagues in East Lansing, MI. However, the move to TAMU was a unique opportunity to expand their horizons and for Jim to improve his knowledge and expertise by working with warm season turfgrasses. He remained at Texas A & M until he retired in 1992. His retirement was short-lived; not long after leaving Texas A & M University, Jim formed the International Sports Turf Institute (ISTI) where he presently serves as its president and chief scientist. In this capacity, he guides international research

and education programs, instructs turfgrass education through seminars and workshops, and provides technical assistance on turfgrass environmental, construction and management issues.

Jim and Harriet feel they have the best of both worlds now. Jim has academic ties to TAMU with his professor emeritus status and the opportunity to be his own boss with the ISTI. Harriet likes the fact they can spend part of the summer at their lakeside home in northern Michigan and their winters at College Station, TX. Jim loves to fish. So, he keeps thinking he will find more time in his busy schedule for fishing when he's in Michigan.

When Dr. Beard arrived at MSU, there was one student specializing in turfgrass management at the B.S. level. Upon his departure in 1975, there were more than 30 students majoring in turfgrass management, exceeding the total number of students in soils and crops areas within the department. In addition, he initiated a two-year technical training program in 1967. This program ranks among the top two-year technical opportunities in the United States, with an enrollment of 80 students filled on a selective basis from an excess of applicants each year. The MSU undergraduate and two-year technical turfgrass curriculums based on Jim's initial efforts

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remain strong today.

Upon Jim's arrival at Texas A & M University, there were three students in the turfgrass option at the B.S. level not dissimilar to the situation he faced when he arrived at MSU. He revised and expanded the turfgrass curriculum, resulting in dramatic increases in enrollment in the turfgrass option. Student numbers increased to as high as 50 and typically the numbers were in excess of 40 turfgrass majors. He regularly advised more than 40 undergraduate students yearly in curriculum, summer employment, and post graduation employment. Dr. Beard is known as a challenging and demanding teacher, even in the workshops he conducts. He has high expectations of his students. His students

seem to respond positively to his demanding teaching style and are attracted to his teaching opportunities based on his reputation as an outstanding instructor.

Dr. Beard has had a significant impact on the instruction of turfgrass students throughout the world. Two of his books dominate as texts in turfgrass instructional programs. His book, *Turfgrass: Science and Culture*, is one of the most widely used texts and is considered a primary reference source by many in the turfgrass industry. Publication of *Turfgrass: Science and Culture* is associated with the start of the increased recognition of turfgrass science as a discipline of applied science. It is certainly evident that its impact on the turfgrass industry has been positive on a worldwide basis. His book, *Turf Management for Golf Courses*, is widely used as well. It covers golf course construction and management, and is a standard throughout the golf industry. It also serves as a reference and a text.

One of Jim's greatest turfgrass legacies is the students he has trained at both the undergraduate and graduate levels. His students have gone on to be leaders in the turfgrass industry. Many have played leadership roles in states like Arizona, California, Illinois, Indiana, Florida, Michigan, Minnesota, Missouri, Montana, Nebraska,

Honors and Awards of Dr. James B. Beard

Friburg Foundation Undergraduate Fellow, Ohio State University, 1956-57

Gamma Sigma Delta Honor Society, 1957

Alumni Outstanding Senior Award, Ohio State University, 1957

Graduated Summa Cum Laude, Ohio State University, 1957

National Science Foundation Graduate Student Fellowship, Purdue University (Among the first to receive this honor), 1959-61

Outstanding Alumni Award in Agronomy, Ohio State University, 1961

Sigma Xi National Scientific Honorary Society, 1960

National Science Foundation Study Grant Recipient (One of only 20 recipients nationwide invited to participate in an Advanced Science Seminar on Desert Biology. Studied heat adaptation and stress mechanisms.), 1966

National Science Foundation Post-Doctoral Fellowship Recipient (One of only 200 nationwide to receive this honor across

all sciences), 1969-70

Named Fellow in the American Society of Agronomy and the Crop Science Society of America, 1971

Meritorious Service Award from the International Turfgrass Society, 1973

Service Recognition Award from the American Sod Producers Association (Now Turfgrass Producers International), 1975

Meritorious Service Award from the Michigan Turfgrass Foundation, 1978

The Oberly Award for the best bibliography in agricultural sciences from the American Library Association, 1978

American Men and Women in Science and Who's Who in America, 1980

TAMU Former Student Association Distinguished Achievement Award for Research, 1987

Turf Master Award of Grounds Maintenance, 1987

The Fred V. Grau Turfgrass Science Award Recipient from the Crop Science Society of America, 1988

President of the Crop Science Society of America, 1987

First President of the International Turfgrass Society, 1969

USGA Green Section Award, 1989

Fellow in the American Association for the Advancement of Science, 1990

Phi Beta Delta Honor Society for International Scholars, 1990

Crop Science Research Award, Crop Science Society of America, 1993

Honorary Member, O. J. Noer Research Foundation, 1995

Distinguished Alumni Award, Ohio State University, 1995

Founders Award, Sports Turf Managers Association, 1998

James and Harriet Beard fellowship established at Michigan State University, 1999

Donald Rossi Award, Golf Course Builders Association of America, 1999

Honorary member of numerous state, regional, national and international turfgrass organizations

North Carolina, Ohio, Texas and Wyoming. One former student was elected president of the Golf Course Superintendents Association of America and a second was president of the American Sod Producers Association (now TPI). Another was elected president of the Crop Science Society of America.

Dr. Beard's former graduate students have had a major impact on the turfgrass industry. During his career, he has trained 46 graduate students at the M.S. and Ph.D. levels. His doctoral students have filled positions in teaching, research and extension at leading universities, as well as research directors at major turfgrass companies. His former students have had a significant impact on turfgrass science. They have been actively involved in turfgrass research, teaching and extension activities. Each year at the Crop Science Society of America meetings, over 50 percent of the scientific papers presented are authored or co-authored by his former graduate students or the students they have trained.

Members of the turfgrass industry and his peers identify Dr. Beard as an outstanding scientist. His career contributions to the discipline of turfgrass science are second to none. No other turfgrass researcher has contributed more to the scientific data for warm and cool season turfgrasses than Dr. Beard. He has authored or co-authored nearly 300 scientific journal articles and over 400 popular trade journal articles. Dr. Beard is widely sought as a lecturer. He has a unique ability to present complicated, technical issues in a manner that is easily understood and used by turfgrass practitioners. His speaking engagements are often accepted several years in advance. He typically speaks at five or six state or regional turfgrass conferences, two or three national meetings and one international program each year. In addition, he also frequently lectures for industry seminars and workshops.

Upon his arrival at Michigan State University in 1961, he immediately began to make contributions to our basic understanding of turfgrass physiology and ecology while sharing this information in ways that made it practical and useful to the industry. He continued these contributions and accomplishments when he went to Texas A & M University. His research with warm-season turfgrasses has challenge many physiologic and management issues that were not previously supported

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with scientific data. He has made many of his contributions in concert with colleagues, his many graduate research students and staff members.

Jim established the first model for interpreting summer stress on bentgrass putting greens, including thresholds for root maturation and growth stoppage, and related physiological factors. His work has questioned theories related to high temperature stress and increased respiration rates resulting in carbohydrate depletion and the associated depletions in glutamine levels. He conducted pioneering research that characterized the micro-environment of bentgrass putting greens, including the effects of air movement and syringing on canopy cooling. This work has led to many practical recommendations for the maintenance of putting greens under high temperature stress conditions.

In his early work at MSU, he established the basic low temperature hardiness of the major turfgrasses. His research established the differences in crown injury relating to differential hardening and hydration. He disproved the existing theory of oxygen suffocation or toxic gas accumulations under ice sheets being the major cause of turfgrass winterkill. He further demonstrated that turfgrass winterkill is associated with direct low temperature injury due to increased crown hydration from standing water in and around the crown as the ice and snow melts. His later research at TAMU developed the physiological and anatomical responses associated with low temperature discoloration and chill injury of warm season turfgrasses.

He conducted natural tree shade studies on cool-season turfgrasses that revealed the importance of the combined effects of micro-environment and pathogens as being the primary factors limiting turfgrass shade adaptation. His research showed the physiological basis of shade adaptation in cool-season turfgrasses was related to

enhanced balance between photosynthesis and respiration relationship that maintains positive CO₂ balance, reduced light compensation point, and increased efficient use of low light intensities. His later research established the adaptation of turf-type tall fescues for use in shade in warm humid climates.

Jim was the first to describe the morphological and physiological factors contributing to wear tolerance of cool-season turfgrasses. His research demonstrated the importance of verdure, lignin content and distribution of sclerified tissues in contributing to species wear tolerance differentials. His research developed a wear simulator device that allowed other researchers to conduct comparative wear tests on turfgrass species and to differentiate management effects on turfgrass wear tolerance. He was the first to establish the importance of potassium nutrition in relationship to turfgrass wear tolerance.

In the late 1960s and early 1970s, Jim's research demonstrated the benefits of returning clippings to turfgrass stands and that clipping return had minimal effect on thatch accumulation. He was the first researcher to prove that rotary mower housing and blade design could be used to effectively mulch clippings to enhance recycling into turf stands. In his early research, he showed the superior mowing quality of the reel mower compared to the rotary type of cut, and the increased disease resulting from additional wounding caused by the rotary mowing action. Around this time, his research also delineated the physiological basis of differential thatch accumulation among turfgrass species and cultivars based on cell wall constituents like lignin and cellulose.

Jim conducted pioneering research in many phases of commercial sod production. His research has led to improvements in sod tensile strength and reduced production time. He developed the first techniques to quantify sod strength and transplant rooting. These techniques are now widely used in sod production research. His research documented the importance of early morning harvesting, lower cutting heights and clipping removal in minimizing sod heating during shipping, as well as delineating the mechanisms involved in sod heating. He also conducted the original research that led to the development of an innovative method for shortening the time required for sod formation by using netting in sod production.

Jim's research at TAMU characterized differences among warm season turfgrass species rooting potentials. He discovered the phenomenon of spring root decline in warm-season turfgrass species. He further characterized the environmental parameters that induce spring root decline as well as the physiological basis related to carbohydrate partitioning. This research led to practical recommendations for the most effective timing of core cultivation and fertilization practices for warm season turfgrasses. He also characterized the distribution and frequency of root hairs and their role in drought resistance of perennial grasses.

Water conservation continues to be an issue to many turfgrass managers. Dr. Beard conducted pioneering research in this area. He and his colleagues were the first to characterize stomatal densities and distributions on the leaf blades of the major turfgrass species. He was the first to quantify the components of resistance to evapotranspiration (ET) in turfgrass canopies. His research demonstrated the importance of canopy resistance in comparison to stomatal resistance for influencing turfgrass water use rates when soil moisture was not limiting. He and his colleagues proved the canopy resistance and leaf area concept was the prime factor controlling ET from irrigated turfgrasses. He subsequently found that this concept controls the comparative ET rates of turfgrass species and cultivars, as well as the effects of cultural practices on evapotranspiration. He and his colleagues developed procedures to rapidly and effectively predict water use rates of turfgrass selections. These procedures have proven useful to plant breeders who are interested in improving water conservation in turfgrasses. His research also found water use rates can be moderated by reductions in leaf area through reduced mowing heights and lower nitrogen nutrition levels. His early research demonstrated plant growth regulators could be used to significantly reduce turfgrass water use rates. His research in this area set the stage for contributions by many other researchers working in the area of turfgrass water conservation.

Dr. Beard's water conservation research was coupled with extensive efforts to assess drought resistance in warm season turfgrasses. He established drought avoidance and tolerance information on most of the major warm season turfgrasses. He was the first to conduct stomatal character-

izations related to the rate of stomatal closure and to epidermal wax accumulation during water stress in turfs. He further established their relationships to drought resistance.

He developed a system for winter overseeding of cool season turfgrasses into dormant warm season species. This system shortened the fall transition and ensured a uniform transition back to the warm season species in the spring. He also developed the first soil temperature prediction model for use in determining the optimal timing for winter overseeding of

perennial ryegrass into warm season turfs. His research established the preferred composition of perennial ryegrass and *Poa trivialis* for winter overseeding in terms of optimum turfgrass quality and traffic tolerance.

These are only a few of the many contributions to turfgrass science that Dr. Beard has made. He has conducted applied and basic research in many areas of interest to the turfgrass industry. His research with sports turfs, pest control and management, cultivar evaluation and identification, classification of C3 and C4

Continued on page 78



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If the EPA wants to advance an unscientific or political agenda, Congress should rethink that agency's funding.

Whether the Washington EPA gang likes it or not, they still serve at the pleasure of the Congress and taxpayers. And agricultural producers should let their lawmakers know, in no uncertain terms, that the EPA is creating more problems than it is solving.

Editor's Choice:

turfgrass species, flooding, seed and sod establishment, wetting agents and other products are just a few of the kinds of research contributions he has made and are not touched upon in this article. The breadth and depth of his research contributions are second to none in our industry.

Jim has also performed yeoman-like service to the turfgrass industry and professional societies. His frequent contributions to state, regional, national and international turfgrass conferences have already been mentioned. He has chaired and served on numerous committees for various organizations, like TPI, GCSAA, PLCAA, and others. He is by far the most

active turfgrass scientist on a worldwide basis. He has lectured and advised turfgrass managers in Australia, Canada, England, Greece, Israel, Italy, Malaysia, New Zealand, South Korea, Singapore, South Africa and Sweden. Jim made vital contributions to international turfgrass research and education by initiating and organizing the first International Turfgrass Research Conference (ITRC) was held in Harrogate, England in 1969. He served as the first president of the International Turfgrass Society. The ITRC has continued meeting every four years. It has grown in its international attendance and research contributions every time the conference has been held. His services to ITRC continue, as he is an associate editor for the upcoming conference journal in 2001. Jim was also elected president of the Crop Science Society of America (CSSA), which is the professional society for crop scientist and includes a division for turfgrass science. Jim made many improvements in the CSSA during his tenure as president, including improving operations of the Crop Science Journal and implementing an operations manual for the society.

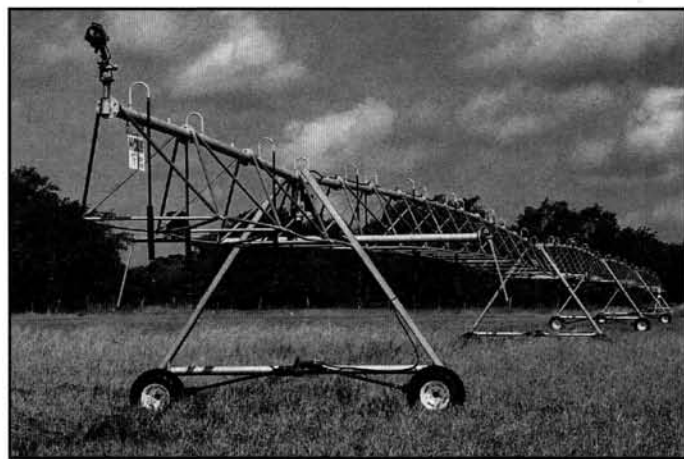
Dr. James B. Beard is truly a leader in turfgrass science and education. The depth and breadth of his career contributions



Dr. James Beard, representing TPI, presents an honorary membership plaque to Dr. Paul Rieke during the summer convention banquet at MSU.

substantiate this as fact. He has created an outstanding legacy in the students he has trained and the leadership roles these individuals play in the turfgrass industry. No other turfgrass scientist has had as great an impact on the discipline turfgrass science as Dr. Beard. His contribution to our basic and applied knowledge of cool and warm season turfgrasses is second to none. His ability to communicate highly technical information in a manner easily understood by turfgrass managers makes him one of the most effective teachers of turfgrass science and management principles. He is an international ambassador for the discipline of turfgrass science.

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