Objectives:
(1) Hold biocontrol field days at three locations in Michigan to facilitate distribution of the pathogen throughout Michigan, wherever Japanese beetle has been found.

Pesticide Application Risk Reduction Technology for Golf Course and Athletic Field Turfgrass Using Treated Sand Topdressing Technology

Dr. J.M. Vargas, Jr., Ron Detweiler, and Nancy Dykema

Research at M.S.U. suggests that it may be possible to combine the routine golf course maintenance operations of sand topdressing and pesticide application into one efficient operation, using a combination sprayer/topdresser machine. This novel technology should reduce the cost, play disruption, and the environmental impact (fuel use, CO2 emissions) of these maintenance operations by reducing the number of trips over the turf, especially greens and tees. The potential for operator and bystander exposure to spray drift and volatilization should also be reduced, since the sprays will be applied to the sand in a wind-protected environment on the topdresser, prior to expulsion of the sand to the turf. "Proof of concept" research is underway for the control of turfgrass diseases such as dollar spot and anthracnose, and to expand the utility of this technology beyond fungicides, to fertilizers and other sprayable turfgrass maintenance products

Optimizing the Efficacy and Environmental Fitness of a Commercial *Pseudomonas* Bacterial Biocontrol Product for the Control of Turfgrass Disease

Liewei Yan and Dr. J. M. Vargas Jr.

Dollar spot caused by *Rutstroemia floccosum syn. Sclerotinia homoeocarpa* F. T. Bennet, is the most costly disease on golf courses. This pathogen is becoming resistant to many different fungicide chemical classes thus increasing the need for development of a sound biocontrol alternative to chemical fungicides. A fungicide/antibiotic-producing bacterial strain of *Pseudomonas aureofaciens* Tx-1 (Tx-1) has been commercialized for golf course use with some success in recent years. To achieve adequate control it must be applied daily. This may be partially explained by UV susceptibility of Tx-1, which is a common limitation of biocontrol agents. Results from various wavelengths of ultraviolet radiation (A, B, C) exposure tests showed a significant drop in Tx-1 survivors following increased dosage. Protection with a promising sunscreen was demonstrated in all UV exposure tests. Addition of this sunscreen to Tx-1 cultures provided statistically significant improvement in UV-B tolerance compared to Tx-1 alone. In an attempt to identify the most UV-resistant individual cells, Tx-1 was exposed to intensive UV light (UV-C) for various lengths of time (*in vitro*). Cells (10TC30) with significantly improved survival rate after 7 J/m^2 UV-C irradiation was found followed by 10 cycles of 30 seconds of UVC exposure. Results from bioassays against *R. floccosum* showed the production of antibiotics efficacious did not change after UV exposures. Field data of dollar spot studies