2006 Research Extension Proposal to the Michigan Turfgrass Foundation

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Continuing Projects

Weed Garden: In 1998 a weed garden was established at the south end of the turf center property. This display has been very useful for learning the identification of broadleaf and grassy weeds of turf. Proper identification is the first step to control. Although very labor intensive, the garden has been very useful during training sessions with extension agents, and visits from lawncare operators. The garden is a major component of the Weed ID workshop held on the afternoon of field day and has served as a ready source of plant material for the Turfgrass Pest Management class and Turfgrass Short Course, which are taught each fall. With the help of the MTF, exceptional progress was made in 2001. The number of specimens was increased and the quality of specimens was also improved. Due to the success of the weed garden, permanent plastic signs have been made to identify the plots year-round. Additionally, enough plant material was generated in 2001 to ensure that live plant samples will be used for the Turfgrass Weed ID and Management Workshop at the 2002 MTF Conference and will used again this year. This will be a tremendous addition to the workshop and has resulted in an increase in re-certification credits awarded to the class as well as 0.35 CEU's from the GCSAA.

Estimated Budget: $1,400
Project Life: no end date

Best Management Practices for Weed Control: Common recommendations to LCO's and homeowners include mowing high and providing adequate fertility. Without proper management weed control will be at best, temporary. This study is examining mowing height, fertility, and postemergence herbicide treatment. Plots were maintained at two or four inches, and received either no fertility or 3 lb of nitrogen per 1000 ft^2 per year. In October of 1998 postemergence broadleaf herbicides were applied to half of the plots. Broadleaf weed populations have been monitored since the beginning of the experiment. The re-infestation of white clover and dandelion has been slowest in the fertilized plots and those treated with Confront. Unfertilized plots maintained at four inches have proven to be an excellent environment for clover. The taller height of cut in conjunction with the 'holiday' fertility program has not eliminated existing weeds. However, these management practices have proven to create a more competitive turfgrass stand that better resists re-infestation after a postemergence broadleaf herbicide application. Broadleaf herbicides were reapplied in 2001. We will continue to monitor weed populations and identify those practices that will delay additional herbicide treatments after the weeds have been eliminated. It is interesting to note that plots maintained at 4 inches and receiving 3 lb of nitrogen per 1000 ft^2 have shown a 75 percent reduction in broadleaf weed populations without any herbicide treatment. A second BMP area was established in the fall of 2001. This area has a history of heavy crabgrass pressure which was evident in 2002 and should facilitate the study of broadleaf and annual grassy weeds as affected by mowing height and 'holiday' fertilization. Weed populations were monitored in these plots throughout 2002. Dandelion, white clover and crabgrass have begun to infest these plots. However,

herbicide treatments were not made in October as it was decided to let the weed pressure build for at least another season. Results from the initial BMP plots indicated that evaluating alternative mowing heights could help determine minimum and maximum parameters. After conducting a survey of residential mowing equipment, we have decided to maintain the new BMP plots at 1.5 inches and 3.0 inches in 2003. Additional changes for this trial include limiting mowing frequency to once per week to further stress the grass during luxury growth periods in the spring and fall. This project has been submitted to a peer-reviewed journals for publication and will be presented at the 2005 International Turfgrass Conference.

Estimated Budget: $1,200
Project Life: no end date

T^3 Weed Protocols: The T^3 weed program started in 1997 has been very popular. A list of difficult-to-control weeds for Michigan has been developed. Through this research we have developed recommendations for several speedwells species, ground ivy, and clover. We have continued work with ground ivy and initiated studies on wild violet, quackgrass, and equisetum. The turfgrass fact sheet 'Ground Ivy Control' is a direct result of our T^3 Weed research. A large study was conducted in 2003 to evaluate herbicide replacements for clopyralid, a common ingredient in many commercial herbicides. Primarily, this involved stand-alone and tankmix combination with fluroxypyr. This compound is also in the pyridine family and demonstrated very good white clover and dandelion control. This information will be very useful in developing future weed control recommendations with the residential removal of clopyralid. Further studies are planned to examine turfgrass tolerance for the common cool-season species.

Several weed areas were established in 2002 to accommodate future research needs. Forty pounds of crabgrass seed were slit-seeded into a 1.5 acre area at the south end of the turf center. Additionally, a dandelion, broadleaf plantain and white clover combination area was established after Field Day in August. Currently, most of the broadleaf weed control trials are conducted off-site. These new areas should facilitate our ability to present results at Field Days (this area has matured nicely and was used for Field Day in 2004 and 2005).

Weeds for 2004-2005: Prostrate Knotweed, Creeping Speedwell, Broadleaf Plantain

Studies completed for knotweed, wild violet, crabgrass, germander and creeping speedwell.

Estimated Budget: $4,900 (real total of $18,200 offset by industry support)
Project Life: 2006-2007

Annual and Rough Bluegrass Management (*Poa annua, Poa trivialis)*: Turfgrass management professionals, including golf course superintendents, sports field managers, sod producers, and lawncare operators, have spent years trying to eradicate annual bluegrass from their turf swards. Annual bluegrass (*Poa*) is one of the most invasive weeds in turfgrass stands. It is also one of the most difficult to control. Objections to *Poa* in turfgrass stands include its prolific seed production, apple green color, and the bare patches that can be left behind when the *Poa* is selectively removed by summer stress or disease pressure. In recent years, rough bluegrass (*Poa trivialis*) has become more prevalent on sod farms and fairways. Our research will focus primarily

on postemergence removal and management practices to diminish the impact of these undesired grasses.

Estimated Budget: $7,500 (industry support of $10,000)

Project Life: no end date

Total Continuing Projects Budget Request: $15,000

New Projects

Relative flowering times for broadleaf weeds of Michigan: Evaluate populations of major and minor weed species throughout the season. Using the phenology chart, record whether a specific species is flowering during any given week. Start ratings in March and correlate relative flowering times with air and soil degree day measurement. From this data, develop a poster that charts the relative flowering times for the observed species. For many broadleaf weeds, flowering is an indicator of susceptibility to postemergence herbicide application and soil conditions. Knowledge of species flowering order can be used to predict when a particular species will be flowering in order to forecast when difficult weed species will be susceptible to herbicide applications.

Estimated Budget: $4,500 (includes $2,500 for publication of phenology poster)
Project Life: 2003-2005

Weed Suppression during Turfgrass Establishment: I would like to initiate the following protocol in the spring of 2006 to examine the effects of spring versus fall renovation timing on the population and species dynamics of the weeds that invade. Which weeds persist, what mowing height is best for establishment and which weed prevention/control techniques are most effective. This trial would be repeated in 2007. At the conclusion of the study the results and recommendations would be summarized in an extension publication for homeowners, municipalities and sports turf managers.

Study parameters:
Grass: Spartan Grade A
Fertilization: $1^{\#}N\ M^{-1}$ @ seeding, $0.5^{\#}N\ M^{-1}$ @ 14 DAS and $0.5^{\#}N\ M^{-1}$ @ 28 DAS
Treatments:

Factor A: Herbicide Treatment

1. Tupersan @ seeding
2. Drive @ 30 DAS
3. Buctril @ 30 DAS
4. Drive + Buctril @ 30 DAS
5. No herbicide

Factor B: Mowing Height

1. 1.5 inches
2. 3.0 inches

Ratings: Evaluate weed populations (species and percent cover) weekly for 10 weeks and monthly thereafter.
Timing: Prepare an area in the spring with a target establishment date of May 1. In order to compare winter annual competition with summer annual competition, study will be repeated on another site with a target establishment date of September 1.

Estimated Budget: $8,000 (Includes $2,000 for publication development)
Project Life: 2006-2007

Total new projects budget request: 2006 - $6,000
2007 - $5,000

Total request for 2006 continuing plus new projects: $21,000