

PROGRESS REPORT – October 1, 2015

“Efficacy of Registered and Novel Fumigants Applied Via Multiple Application Methodologies for Control of Bermudagrass (*Cynodon* spp.) and Other Hard-to-Control Weed Species”

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1.1 PROJECT TITLE

Efficacy of Registered and Novel Fumigants Applied Via Multiple Application Methodologies for Control of Bermudagrass (*Cynodon* spp.) and Other Hard-to-Control Weed Species

1.2 PROJECT OBJECTIVE

Determine the efficacy of registered and novel fumigants applied via multiple application methods including conventional and drip applied to control bermudagrass (*Cynodon spp*) and other hard-to-control weed species.

1.3 PROGRESS TO DATE

Fumigant Screening Trials & Demonstrations

Pike Creek Turf – On July 10, 2014, a screening trial was initiated at Pike Creek Turf in Adel, Georgia (Figures 1 and 2). Mixtures of fumigants including one that has not been evaluated before in turf applications were screened for their efficacy. This trial employed large plots without replication and each fumigant was evaluated at three different rates under two types of plastic tarps that differed in their retentive ability. The best performing treatments from this study were included in a replicated field study at SMR Farms, Bradenton, Florida.

SMR Farms – On November 20, 2014, a 2.0 acre study was initiated at SMR Farms near Bradenton, FL (Figure 3). The objective of this trial was to compare novel fumigants including the experimental compounds tested at Pike Creek Turf. This very large replicated trial included 14 treatments and three different sprigging dates. Plant back was evaluated in this study to assess the influence the fumigants may or may not have on the newly planted sprigs. Pest pressure was not sufficient in this trial to fully document the efficacy of the tested products.

Talis Park Golf Club – A demonstration trial was conducted at Talis Park Golf Club, Naples, Florida (Kevin Shields, Superintendent). One of the combination treatments identified in the Pike Creek trial and included in the SMR trial was chosen as the representative treatment. Treatments were applied May 5-6, 2015 and the tarp was removed from the treated area on May 13, 2015. The treated site will continue to be monitored for twelve months (Figure 4). Anecdotal information suggests that the growth of the site occurred more rapidly than areas treated with methyl bromide. This suggests that the fumigant is not negatively impacting the vegetative planting material.

University of Florida, GC Horn Turf Plots – On May 7, 2015, approximately 8,000 ft² of research plot area was treated with an experimental combination treatment that was identified as “promising” in work conducted at Pike Creek Turf and SMR Farms (this is the same treatment that was used at Talis Park Golf Club). This site housed accessions from the UF Turf Breeding program and was allowed to remain fallow following fumigation for several months to monitor for regrowth/contamination. During the fallow period, the site remained free of vegetative propagules. Private industry is conducting due diligence on the feasibility of registering this and bringing it to the market.

University of Florida – an additional replicated field trial to test the combination treatment identified in the Pike Creek trial and tested at SMR Farms and demonstrated at Talis Park Golf Club and at the UF Turf Research Facility. Scouts are trying to find a suitable site in south Florida for this trial. We hope to initiate this trial in the fall of 2015 or spring 2016.

Steam Injection Technology

We are closely monitoring the development of a large output steam generator prototype by researchers at the University of California – Davis. They are building a new prototype now with a direct fire steam generator acquired from Johnson's Gas Appliance Company in Cedar Rapids IA. California researchers received funding from the California Department of Pesticide Regulation to build the unit. They hope to be operational fall 2015 but are experiencing delays in the production of the steam generator. UC-Davis researchers are working with TriCal, Inc. on this project. Precision Combustion Incorporated (PCI), the company in which this PI had earlier conversations with, are still interested in developing a steam generator for agricultural purposes but, as a small company, they are looking for others to invest in the development.

The USDA-NIFA Methyl Bromide Alternatives Program (<http://nifa.usda.gov/funding-opportunity/methyl-bromide-transitions>) provides approximately \$2,000,000 in funding for methyl bromide alternatives research. The request for proposals is generally issued in mid-March with an early-May closing date. I chose not to submit a proposal in 2015 since the prototype equipment has yet to be developed and historically the funding is used to test or evaluate available technology.

Since only \$2,000,000 is available and the indirect costs are 30%, only \$1,400,000 is available for direct cost funding. Our original proposal, which included equipment cost engineering of \$150,000, was \$336,297.26 – approximately 25% of the total direct costs available nationally. We opted to not submit the proposal due to our feeling that the proposal would not be reviewed favorably since the equipment we were proposing to test was not developed yet. Furthermore, the program requires a 100% cost sharing or matching requirement and this level of cost share simply wasn't available.

Given the current state of equipment development, we are hopeful that we can submit under the 2016 request for proposals – assuming this program continues to exist. With the equipment in place, approximately one-half of the requested budget can be removed thus making it more favorable in the eyes of the review panel. The cost share requirement will still be a challenge and will require that industry commit funds to move the project forward.

Drip-Applied Fumigation

A drip-applied fumigant study, as described in the original proposal, is still being planned and should be initiated during 2015. We will continue to assess whether or not fumigants applied through drip technology will work for golf course putting greens (simulated).

Dazomet (Basamid™) Efficacy Study

With the stockpile of methyl bromide nearly exhausted, dazomet is now being marketed and used. Dazomet is generally surface applied, sometimes rototilled, and then covered with high-barrier film or watered in. Efficacy data for this method is lacking but anecdotal information is prevalent. We are planning to conduct a trial with the goal of documenting efficacy.

1.4 PROJECT TIME LINE

Studies will continue to be conducted throughout 2015 and 2016.



Figure 1 - Fumigation study conducted at Pike Creek Turf in Adel, GA. Photo taken July 10, 2014.



Figure 2 - Fumigation Study at Pike Creek Turf, Adel, Georgia. Photo taken September 22, 2014.



Figure 3 - Fumigation study conducted at SMR Farms near Bradenton, FL. Photo taken November 20, 2014.



Figure 4 - Talis Park Golf Club (Naples, FL) rough area treated with an experimental fumigant. Photo taken June 16, 2015.