Use of VA Mycorrhizae in Establishment and Maintenance of Greens Turf

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Goals:

- Identify species of mycorrhizal fungi associated with bentgrass and *Poa annua*.
- Develop techniques to culture fungi.
- Use fungi to promote turfgrass establishment, minimize phosphorous applications, and increase disease tolerance.

This report describes research carried out from November 1992 through November 1993. The original project consisted of several interdependent studies: identifying the species of mycorrhizal fungi that are associated with velvet and creeping bentgrass and *Poa annua*, culturing these fungi, and testing the fungi to promote establishment of greens turf, minimize applications of phosphorous fertilizers, offer protection against root pathogens, enhance resistance of greens to invasion by *Poa annua*, and increase drought tolerance.

Major accomplishments during the period covered by this report include:

1. Field and greenhouse studies with mycorrhizal fungi conferred markedly enhanced drought tolerance in creeping bentgrass.

2. Mycorrhizal turf contains significantly more proline, an amino acid implicated in drought tolerance and disease resistance.

3. Three fungal isolates significantly stimulate growth and early establishment of turf.

4. Fertilization of mycorrhizal turf with low levels of phosphorus results in plant growth that is equal or superior to that resulting from higher phosphorus levels.

5. Mycorrhizal PENNCROSS turf is greener than nonmycorrhizal turf, possessing nearly 60 percent more chlorophyll.

6. Benefits of mycorrhizae could be consistently

maintained by frequent applications of a complete fertilizer solution containing low concentrations of phosphorus. Established mycorrhizal turf that no longer showed benefits (because of excessive application of phosphorus or fungicides) could be easily restored.

7. A commercial source of mycorrhizal inoculum has been found. In addition to providing their own fungal isolate, they are willing to produce inoculum of our sand dune isolates that have shown promise in the sand green medium.