Successful Control of English Lawn Daisy *(Bellis perennis)*

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Introduction

English lawn daisy or English daisy (*Bellis perennis*) is the most troublesome and difficult to control broadleaf turfgrass weed in California. English daisy continues to flourish in turf stands and frustrate turf managers due to its ability to adapt to a wide range of cultural practices, and to resist and tolerate many of the presently registered broadleaf herbicides.

English daisy is a fibrous rooted perennial with basal leaves and a prostrate, spreading growth habit. The leaves are nearly smooth or loosely hairy, entire margined or variably toothed, broad above, and narrowed at the base to a long stalk. Flower heads are white or pinkish with yellow centers. Flower stalks generally exceed the leaves in length.

This aggressive and troublesome weed spreads through a rapidly advancing rhizome system, and exhibits the potential to root and produce new plants at each node along individual rhizomes. English daisy also appears to be a prolific seed producer. Germinating seedlings have been observed in Northern California from April until late September. Once established in turf this dual propagation system contributes to the rapid spread and invasion of English daisy in adjacent turfgrass areas. English lawn daisy was introduced from Europe as a garden plant and today there are thought to be at least six known biotypes in California.

Field Research 1992-2008

Applications of chloro-phenoxy herbicides have historically exhibited poor control of English lawn daisy. In the past when English daisy populations were extreme, golf course superintendents would often make three to five applications per year of 2,4-D and related products with poor results. The greatest benefit of chloro-phenoxy applications was short-term flower removal and suppression.

With the registration of quinclorac (Drive 75DF: BASF) in California the potential to control English daisy improved. Although quinclorac alone never exhibited high levels of English daisy control in our field trials when used as a stand-alone application, it did appear to enhance the performance of other products when used in tank mix combinations. Three-way tank mix combinations of SpeedZone Southern (2,4-D, MCPP, dicamba, carfentrazone: PBI Gordon), Drive 75DF (quinclorac: BASF) and Vanquish (dicamba: Syngenta) exhibited improved activity on English daisy. In rough areas three applications of this three-way tank mix showed 75-80% English daisy control and in fairways 50-60% control.

Over the last 16 years Mark M. Mahady & Associates, Inc. has conducted 15 replicated field research trials for the control of English daisy in cool season grass fairway and roughs areas. To date 31 products and 90 different product combinations have been evaluated. Those products

screened for English daisy suppression and control include Trimec Classic, Trimec Amine, Confront, Gallery, Turflon, Drive, SpeedZone, Vanquish, 2,4-D, 2,4-DP, Lontrel, Greenor, Roundup Pro, Scythe, Prograss, Dissolve, Triplet, TriPower, Triamine II, Lesco 3-Way, MSMA, MCPP, MCPA, Momentum, Millenium, Chaser, Carfentrazone, Spotlight, XDE-565, Mesotrione and Penoxsulam.

To date the best performing product reviewed for selective postemergent control of English daisy in cool season grasses has been Penoxsulam. Penoxsulam is manufactured by Dow AgroSciences and exhibits the following classifications and characteristics:

- Sulfonamide herbicide classification
- Postemergence herbicide, ALS (acetolactase synthase) inhibitor
- Mobile, but not persistent
- Low volatility
- Reduced risk pesticide due to its favorable human health risk profile

Since 2004 five replicated field research trials and two superintendent applied split fairway demonstration trials have been conducted on golf courses in the Monterey Peninsula in order to evaluate the performance of Penoxsulam for English daisy control. The key take home messages from these trials are as follows:

- Late summer/early fall is the best time period for efficacious applications of Penoxsulam. Apply the first application on approximately September 25 with a second application 21 days later.

- At application rates of 0.02 lb. ai/A no injury to cool season grasses has been observed in our trials. Some golf course superintendents have reported slight and short term yellowing on *Poa annua*. No long-term reduction in surface quality has been observed. At very high rates (0.08 lb. ai/A) injury to some varieties of perennial ryegrass has been observed.

- A minimum of two sequential applications at 0.02 lb (9 grams) ai/A is required for high levels of control. Single applications are much less effective with dynamic regrowth of English daisy often appearing.

- With late summer/fall timing two sequential treatments applied at a 21-day interval will provide high levels of control (95%+). In a replicated field trial conducted on a golf course fairway in 2006-2007, two late summer treatments of Penoxsulam applied at 0.02 lb (9 grams) ai/A resulted in 96% English daisy control 345 days after the second application. In a replicated field trial conducted on a golf course fairway in 2007-2008, two late summer treatments of Penoxsulam applied at 0.02 lb (9 grams) ai/A resulted in 100% English daisy control 70 days after the second application.

- If spring applications are planned a third sequential application will be required for high levels of control.

- Use a non-ionic surfactant at standard label rates with all applications.

Penoxsulam is an exceptional new tool for English daisy control in cool season turfgrasses. California registration is expected during the summer of 2008.

Acknowledgements

Over the last 16 years many product development companies have graciously provided funding to support English daisy field research.

We would like to thank Dow AgroSciences, The Northern California Golf Course Association, BASF, LESCO, PBI Gordon, DuPont, Syngenta, Rancho Canada Golf Club and Mark M. Mahady & Associates, Inc. for their generous financial support.

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