Annual Bluegrass and Creeping Bentgrass Germination Response to Flurprimidol

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Abstract. Seed of Poa annua var. repans (Hauskins) Timm. (annual bluegrass) and Agrostis palustris Huds. 'Penncross' (creeping bentgrass) were treated at planting with flurprimidol at rates of 0.00, 0.28, 0.56, 0.84, 1.12, 1.65, and 2.24 kg·ha⁻¹. Data were collected on germination of each species. Flurprimidol rates greater than 0.56 decreased germination for both species. Chemical name used: α-(1-methylethyl-α-[4-(trifluoro­methoxy)phenyl]-5-pyrimidine methanol (flurprimidol).

Poa annua L. (annual bluegrass) invades close-cut, irrigated, intensively managed cool season turfs and within 3 to 5 years may dominate the stand (11). Annual bluegrass may invade desired species, filling voids left by mismanagement, disease, traffic, cultivation, and other stresses (1). Annual bluegrass may reestablish these areas vegetatively (1) or from seed in the soil (7). Control programs are based on the removal of annual bluegrass over a number of years while managing the turf for the desired species, or re-establishment of the desired species after annual bluegrass eradication (2, 5, 8). One management approach would be to employ a plant growth regulator to inhibit selectively the growth of annual bluegrass and encourage the desired species, allowing a gradual transition from annual bluegrass dominance while maintaining turfgrass aesthetic and functional qualities. Flurprimidol reduced annual bluegrass in perennial ryegrass (Lotium perenne L.) (2). Flurprimidol applied to annual bluegrass and creeping bentgrass (Agrostis palustris Huds.) polystands exhibits selectivity for annual bluegrass growth suppression, indicating a potential for use in the conversion process (10). If the annual bluegrass population in a mixed stand is very high, overseeding with creeping bentgrass is sometimes implemented. Haley and Fer­manian (6) found that flurprimidol was active on young seedlings of annual bluegrass and creeping bentgrass, but information on germination response was not reported. The objective of this research was to determine if flurprimidol applications influenced germination of annual bluegrass and creeping bentgrass.

Clay pots 100 mm in diameter were seeded in the greenhouse, where temperatures fluctuated between 10° and 24°C. The growth medium was 5 sandy loam : 3 sand : 1 peat-moss, (by volume). Half the pots were seeded to 'Penncross' creeping bentgrass (lab germination 85%). The remaining pots were seeded to annual bluegrass (lab germination 92%). Both species were seeded at a rate of 25 seeds/pot. Seed of annual bluegrass was obtained by harvesting mature seed heads from a stand of annual bluegrass located at the Hancock Turfgrass Research Center, Michigan State Univ. The harvested seed was assumed to be of the perennial annual bluegrass biotype, due to the high germination (92%) observed immediately after harvest (1).

Immediately following seeding, pots were treated with flurprimidol at rates of 0.00, 0.28, 0.56, 0.84, 1.12, 1.68, and 2.24 kg·ha⁻¹. Treatments were applied with a backpack CO₂ sprayer with an 8002E nozzle calibrated to deliver 384 liters·ha⁻¹. Pots were irrigated three times daily for 4 min with an automatic misting system. The experiment was conducted on two dates (Oct. 1984 and

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Flurprimidol effects on annual bluegrass (Poa annua var. repta) and creeping bentgrass (Agrostis palustris 'Penncross') germination. Values presented represent means of both species.

<table>
<thead>
<tr>
<th>Rate (kg-ha(^{-1}))</th>
<th>Test date</th>
<th>Germination (%)</th>
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<tbody>
<tr>
<td>0.00</td>
<td>1</td>
<td>100</td>
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<tr>
<td>0.28</td>
<td>1</td>
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</tr>
<tr>
<td>0.56</td>
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<td>0.84</td>
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<td>81.0</td>
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<tr>
<td>1.68</td>
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<td>47.7</td>
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<tr>
<td>2.24</td>
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<td>70.3</td>
</tr>
<tr>
<td>4.42</td>
<td>2</td>
<td>73.7</td>
</tr>
</tbody>
</table>

Percent germination for the controls were normalized and treatment values were adjusted to a percentage of the control. Germination counts taken 21 days after treatment.

LSD (P = 0.05) for test date = 6.5%; LSD (P = 0.05) for rate = 8.4%.

Results of this experiment indicate that at or near time of bentgrass overseeding, if overseeding is not planned, flurprimidol will have some preemergence activity on annual bluegrass seed present in the soil. Only one biotype of annual bluegrass was evaluated, and the extreme variability exhibited by this species should be considered when extending these results to all annual bluegrass biotypes.

Literature Cited