Response of Chrysanthemums Grown in Clay and Plastic Pots to Soil Applications of Ancymidol

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Abstract. α-Cyclopentoyl-α-(4-methoxyphenyl)-5-pyrimidine methanol (ancymidol) applied at 2 drench rates (0.25 mg and 0.50 mg/15 cm pot) controlled height and increased stem diameter of Chrysanthemum morifolium Ramat. cv. Neptune grown in clay and plastic pots. Flower diameter was decreased by ancymidol treatments and anthesis was progressively delayed with increased rates. Watering frequency was reduced by use of plastic pots and growth regulator.

Potted chrysanthemums are grown in a variety of containers, but primarily clay and plastic. Different containers probably would require different regulator rates due to variable absorption into porous container walls. Watering frequencies probably require adjustment to compensate for plant size limitation from regulator treatments and different air exchange rates of containers. This experiment compared effects of ancymidol, a growth regulator that limits stem internode length of pot chrysanthemums when applied as drench or spray (3, 4), on growth, flowering, and water requirements of chrysanthemums grown in clay and plastic pots.

Rooted cuttings were planted March 5, 1973 with 5 cuttings per 15 cm standard clay or plastic pot in a 1:1:1 soil, sand and peat (v/v/v) mixture and placed into greenhouses regulated at 21°C (day)/16°C (night). The plants were given 1 week of long days, pinched 1 week later, and 2 weeks later ancymidol was applied. Lateral or side buds were removed as they first developed. Drench applications of ancymidol were applied to both type pots at 0, 0.25 and 0.50 mg/pot rate in 200 ml of solution. Each pot was considered an experimental unit and treatments were in a randomized block design replicated 18 times.

Watering frequencies were determined by pot tensiometers and 400 ml of water applied when moisture tension reached 500 millibars.

Time of anthesis was not influenced by pot type, but as the concn of ancymidol increased there was a delay in flowering (Table 1) as observed by other researchers (1, 4). Flower diam was reduced .34-.44 cm by ancymidol treatment compared to untreated checks. This response has been observed in other crops (2).

Plant height and stem diam were unaffected by type of container. Ancymidol limited height by 25-28% at the low rate and 37-39% at the high rate, compared to check plants. There was a nearly proportional increase in stem diam with height reduction. Stem diam increased 27-29% at the low rate and 35-37% at the 0.50 mg ancymidol rate compared to the checks.

 apparently, possible loss by absorption into porous walls of clay pots did not reduce the retarding effectiveness of ancymidol.

Frequency of watering was decreased 21% by using plastic compared to clay pots (39.3 applications in clay vs. 31.0 in plastic). As the concn of ancymidol increased there was a corresponding decrease in water requirement in clay and plastic pots. Such reductions were possibly due to smaller leaf size, and reduced transpiration because of slower growth rates and closer spacing of leaf surfaces (5).

Ancymidol is apparently effective as a retardant in various containers. With limitation of internodal elongation by ancymidol, there are accompanying changes of delayed flowering, slightly reduced flower size, increased stem diam and reduced water requirements.

Literature Cited

Table 1. Effect of ancymidol on days to anthesis, flower diam, stem height and diam, and no. of water applications of chrysanthemums grown in clay or plastic pots.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Ancymidol rate/15 cm pot</th>
<th>Flower Days</th>
<th>Flower Diam (cm)</th>
<th>Stem Ht (cm)</th>
<th>Stem Diam (cm)</th>
<th>No. water applications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clay</td>
<td>0</td>
<td>77 a</td>
<td>8.06 b</td>
<td>33.0 c</td>
<td>.50 c</td>
<td>39.3 f</td>
</tr>
<tr>
<td></td>
<td>.25 mg</td>
<td>80 b</td>
<td>7.64 a</td>
<td>24.5 b</td>
<td>.69 b</td>
<td>37.1 e</td>
</tr>
<tr>
<td></td>
<td>.50 mg</td>
<td>82 c</td>
<td>7.66 a</td>
<td>20.5 a</td>
<td>.75 a</td>
<td>35.2 d</td>
</tr>
<tr>
<td>Plastic</td>
<td>0</td>
<td>77 a</td>
<td>7.98 b</td>
<td>33.4 c</td>
<td>.49 c</td>
<td>31.0 c</td>
</tr>
<tr>
<td></td>
<td>.25 mg</td>
<td>80 b</td>
<td>7.64 a</td>
<td>24.0 b</td>
<td>.69 b</td>
<td>28.9 b</td>
</tr>
<tr>
<td></td>
<td>.50 mg</td>
<td>81 bc</td>
<td>7.61 a</td>
<td>20.2 a</td>
<td>.76 a</td>
<td>26.8 a</td>
</tr>
</tbody>
</table>

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2Department of Ornamental Horticulture. Ancymidol was donated by Eli Lilly and Co., Indianapolis, Indiana.

High Intensity Supplementary Lighting of Chrysanthemum Stock Plants

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Abstract. Stock plants of Chrysanthemum morifolium Ramat. cv. 'Bright Golden Anne' lighted continuously from September 30 to May 15 with a Multi-vapor and Lucalox lamps (100 W/m²) produced more cuttings than those receiving only seasonal daylight and photoperiod lighting. High intensity supplementary lighting improved cutting quality by increased fresh and dry weight and stem diameter. Cuttings from plants receiving high intensity lighting rooted in fewer days, had greater root fresh and dry weights, and greater top fresh weight than plants lighted photoperiodically. After transplanting, the cuttings given high intensity light became established more rapidly and developed into flowering plants of higher quality.

Low greenhouse light intensities in winter limit the growth rate and quality of plants. Supplementary artificial

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2Graduate student and professor, Department of Horticulture. The authors acknowledge the financial support and equipment from the General Electric Foundation and cuttings from Yoder Bros, Inc.