THE USE OF UREA-FORMALDEHYDE NITROGEN ON GREENHOUSE CROPS

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Review

There has been considerable discussion as to the place of Urea-Formaldehyde nitrogen in a greenhouse fertilization program. The grower is interested in what it can and cannot do and how much it will cost. In a previous article (1), it was shown that Uramite (DuPont's Urea-Formaldehyde formulation), at a rate of 1/2 teaspoonful per 4-inch pot mixed with steamed soil to which phosphate and potash had been added, stimulated plant growth over a period of time. Rates of 2 teaspoonfuls and sometimes 1 teaspoonful per 4-inch pot were harmful. Plants tested included Azalea, Cyclamen, Geranium, Hydrangea, Marigold, Philodendron, Sweet Alyssum, and Saintpaulia. Top dressings were successfully used on Hydrangeas but caused some injury on one lot of Croft lilies. The nitrogen supply from the Uramite usually appeared to be inadequate after 3-4 months.

Poinsettias

This winter a test was made on the effect of Urea-Formaldehyde on Poinsettias. Rooted cuttings of the variety Albert Ecke were potted in mid-October in 4-inch pots containing 0, 1/4, 1/2, 1, and 2 teaspoonfuls of Uramite mixed with steamed soil. Considering the effect of the treatments on bract size, number of leaves and height, the 1/2 teaspoonful rate was the most favorable. A few larger plants survived the 2 teaspoonful rate showing that plant vigor may influence how high a dosage of nitrogen they can tolerate. The plants treated at the 1/2 teaspoonful rate were of very good quality. This growing procedure should be tried by some commercial growers, as all that was done was to plant the rooted cuttings in the prepared soil, place the pots on a constant water level bench in a 60°F house and wait for Christmas.

Cream Mefo

Several growers have asked if Urea-Formaldehyde fertilizers can be mixed with the soil before steaming as this is the usual time to mix in peat, lime, and phosphate. Although advertisements indicated that the material could be added at any time, it was decided to see if steaming accelerated the breakdown of the fertilizer. In one commercial range, chrysanthemums were found to be sensitive to Urea-Formaldehyde so this was chosen as the test plant. Borden's 38 was added to the soil before and after steaming at rates of 0, 1/2, 1, and 2 teaspoonfuls per 4-inch pot of soil. No other fertilizer materials were applied. Before treatment the potting soil had a pH of 5.2.

Varieties Cream Mefo, Encore and Shasta were planted in freshly prepared soil (within 24 hours of treatment) on December 22. Yellow Marketeer was planted in freshly prepared soil on January 3. The plants were photographed and records of plant heights taken on February 10. The varieties varied considerably in their reaction to the fertilizer. As seen from Table I and photographs, Cream Mefo and Encore were severely injured by Borden's 38 at the 2 teaspoonful rate when applied before steaming, while Shasta was not greatly affected. Steaming the fertilizer in the soil at the 1 teaspoonful rate also had quite an adverse effect on Cream Mefo and Encore. The main point to consider is that with Cream Mefo and Encore, 3 out of 5 plants were dead in the soil treated before steaming with 2 teaspoonfuls of Urea-Formaldehyde per 4-inch pot.

This test indicates that the 2-teaspoonful rate is excessive for chrysanthemums and also that for some crops on some soils putting the material in the soil before steaming can be dangerous both at the 2 teaspoonful and 1 teaspoonful rate. Therefore, it is probably best never to put Urea-Formaldehyde fertilizers in soil before steaming.

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TABLE I

Effect of Concentration and Steaming of Urea-Formaldehyde Fertilizer on Growth of Chrysanthemums

<table>
<thead>
<tr>
<th>Variety</th>
<th>Check</th>
<th>1/2 tsp. (a) after steaming</th>
<th>1/2 tsp. (b) before steaming</th>
<th>1 tsp. after steaming</th>
<th>1 tsp. before steaming</th>
<th>2 tsp. after steaming</th>
<th>2 tsp. before steaming</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cream Mefo</td>
<td>13(c)</td>
<td>14</td>
<td>11</td>
<td>11</td>
<td>5(1)(d)</td>
<td>8</td>
<td>6(3)</td>
</tr>
<tr>
<td>Golden Herald</td>
<td>9</td>
<td>9</td>
<td>8</td>
<td>8(1)</td>
<td>7</td>
<td>7</td>
<td>5(1)</td>
</tr>
<tr>
<td>Shasta</td>
<td>14</td>
<td>12</td>
<td>12</td>
<td>11</td>
<td>10</td>
<td>8(1)</td>
<td>8</td>
</tr>
<tr>
<td>Encore</td>
<td>13</td>
<td>14</td>
<td>12</td>
<td>11</td>
<td>7(1)</td>
<td>10</td>
<td>4(3)</td>
</tr>
</tbody>
</table>

(a) Fertilizer added after soil was steamed
(b) Fertilizer added and steamed with the soil
(c) Averages of 5 plants
(d) Number in () refers to number of dead plants

How does nitrogen from Urea-Formaldehyde compare in cost with nitrogen from other sources? Cotton seed meal, a 3% nitrogen fertilizer, costs about $5.75 per 100 pounds or $5.75 for 3 pounds of nitrogen. Therefore, each pound of nitrogen costs $1.92. Organic Green, similar to Milorganite, an organic fertilizer, costs about $4.70 per 100 pounds. It contains 5 pounds of nitrogen and 4 pounds of phosphate. If 4 pounds of phosphate is worth about $5.00 based on the cost of super phosphate, the cost of 5 pounds of nitrogen would be $4.20 or $.84 per pound. The cost of a 50-pound bag of Urea-Formaldehyde fertilizer is about $13. This is $26 for 100 pounds of 38% nitrogen or $.68 per pound of nitrogen. The cost of nitrogen in Urea-Formaldehyde is slightly cheaper than in Organic Green fertilizer and much cheaper than from Cotton seed meal. They are similar in effect. Urea, a 42% nitrogen fertilizer, costs about $8 for 80 pounds or $8 for 33.6 pounds of nitrogen, which comes to $.24 per pound for nitrogen. Ammonium sulfate costs about $3.50 per 100 pounds of 16% nitrogen or $3.50 for 16 pounds of nitrogen. This reduces to $.22 the cost per pound of nitrogen. Both these forms of nitrogen are considerably cheaper than the slowly available organic forms.

Where a more lasting supply of nitrogen is desired under conditions of heavy watering or leaching such as with roses and pot plants, it can well be worth the difference in price to use organic nitrogen. Nitrogen from Cotton seed meal is considerably more expensive than from Urea-Formaldehyde—$1.92 versus $.68 per pound. The difference in cost between nitrogen from Organic Green and Urea-Formaldehyde depends to some extent on the value of the organic matter: in Organic Green, if the organic matter is of no direct or indirect value, the cost of nitrogen would be $.84 per pound. If the value of the organic matter were $1, the nitrogen would cost $.64 per pound, which is slightly lower than that of Urea-Formaldehyde nitrogen which is $.98 per pound.

Conclusions

Urea-Formaldehyde fertilizers are not complete but only nitrogen fertilizers. They supply nitrogen over a period of about 3 months and are not readily affected by leaching. Other fertilizer materials should be used at the same time to furnish the other nutrients or incorporated into the soil earlier. Table II gives favorable rates of application when mixed with the soil after steaming. Too much Urea-Formaldehyde fertilizer causes burning. It may not be advisable to mix Urea-Formaldehyde fertilizer with the soil before

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steaming. The nitrogen from Urea-Formaldehyde sources is comparable with nitrogen from other organic sources but is three times as costly as inorganic nitrogen. It may be worth the difference where its long lasting properties are desirable like with heavily watered crops such as roses and pot plants.

TABLE II
Optimum Rates of Application for Mixing with Soil

<table>
<thead>
<tr>
<th>Urea-Formaldehyde</th>
<th>Soil</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/2 teaspoonful</td>
<td>4&quot; pot</td>
</tr>
<tr>
<td>2/10 pound</td>
<td>1 bushel</td>
</tr>
<tr>
<td>3-inch pot</td>
<td>2 bushel</td>
</tr>
<tr>
<td>4 1/2 pounds</td>
<td>1 cubic yard</td>
</tr>
<tr>
<td>2 level 5-inch pots</td>
<td>1 cubic yard</td>
</tr>
<tr>
<td>7 pounds</td>
<td>100 square feet</td>
</tr>
<tr>
<td>3 level 5-inch pots</td>
<td>100 square feet</td>
</tr>
</tbody>
</table>

* 28.3 cubic inches in a 4-inch pot

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NEW TIME FOR SUMMER MEETING

At the request of many growers, the time for the annual summer meeting of the New York State Flower Growers Association has been changed to September 12, 13 at Farmingdale, Long Island.

At this later date, there is more to be seen in the greenhouse, the weather is usually more reliable and most growers will have more free time. It is hoped that this date will be more satisfactory.

Dr. Arthur Bing, of the Farmingdale Ornamentals Laboratory, is in charge of the planning of the meeting and with the help of several grower committees has reported real progress in plans for the meeting. The full program for the meeting should be available in the near future.

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A NEW INSURANCE PLAN

For some time the Association has been considering the adoption of a Group Life Insurance program for its members. Various plans have been studied and a number of insurance carriers have been considered for such a plan. At a recent meeting of the Board of Directors on March 12, 1956 in New York City, after considerable study and due consideration, a Resolution was passed adopting such a Plan through the firm of Laverack and Haines, Inc., 298 Main Street, Buffalo, New York, who are the Managers of the Association's Compensation Insurance Group, with the John Hancock Mutual Life Insurance Company of Boston, Massachusetts selected as the Carrier for the Plan. It was further decided for the present the Plan would be limited to a Group Life Insurance program and we are tentatively considering the following benefits:

<table>
<thead>
<tr>
<th></th>
<th>Benefit Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active Officers, Partners and Proprietors</td>
<td>$5,000</td>
</tr>
<tr>
<td>Department Supervisors, Field Foremen, Superintendents, and Salesmen</td>
<td>$2,000</td>
</tr>
<tr>
<td>All Other Full Time Employees</td>
<td>$1,000</td>
</tr>
</tbody>
</table>

Some of the advantages of such a Plan are as follows:

Available to all regardless of physical conditions.
Available to all Members regardless of size.
It is the lowest cost form of Life Insurance available.
It makes for a better class of employee and helps to reduce labor turnover.
It is a tax deductible business expense.

All Members of the New York State Flower Growers, Inc. which includes those Members of the New York State Nurserymen's Association who are Members of the New York State Flower Growers, Inc. are eligible for this Plan. A tentative starting date for the program is July 1, 1956 and further details can be obtained by the Members from Laverack & Haines, Inc., 298 Main Street, Buffalo 2, New York, or the Secretary of the New York State Flower Growers, Inc., Mr. Harold Brookins, 125 East Quaker Road, Orchard Park, New York.

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Your Editor,