LIMESTONE REQUIREMENT FOR TKS FERTILIZED PEAT

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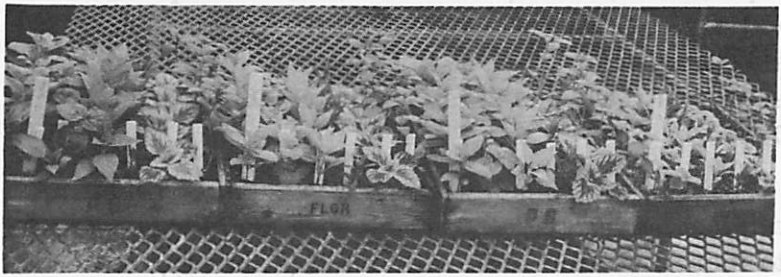
Nutrient amended sphagnum peat moss has been used for some time for flower production in Europe. It has not been generally used in the United States. Preliminary tests (Figure 1) indicate that further trials are warranted.



The TKS formula was developed in Germany and specifies 1350 mg CaO per liter (4.54 lbs. limestone per cubic yard) along with all other nutrients required for plant growth. Assuming that this is an equivalency figure and that limestone in ca 50% CaO equivalent, the figure of 2.7 g/1 was derived as the limestone incorporation rate (actually, dolomitic limestone was used).

As a rule of thumb, 1 pound of dolomitic limestone per cubic foot of sphagnum peat (27 lbs. per cubic yard) will result in a pH of 6.3-6.8. Since 0.595 g/1 = 1 lb/cu. yd., 2.7 g/1 = 4.54 lbs./cu. yd., or ca one sixth the rate of limestone recommended for New England.

The above rate was therefore added to Peat Plus Two* to provide a two-fold (2X) rate. In another treatment, 6 times this rate was added to give a seven-fold (7X) rate.

Control soils included (1) the standard 3(compost): 2(sphagnum peat):1(sand) mix used in the UConn floriculture greenhouses and (2) amended ProMix C. Since ProMix C contains less P than ProMix B and no N, superphosphate (0-20-0) was added at 1/2 lb. and potassium nitrate (13-0-44) at 1 1/2 lbs./cu. yd. to provide equivalency.

Five 'Yellow Mandalay' cuttings** per 6" pot (4 replications) were planted on 6/30/75 and placed on Vattex*** capillary watering with 150 ppm N constant feed from 20-5-30. They were pinched and shaded on 7/11 and sprayed with SADH (0.25%) on 7/16.

Growth responses were noted visually by the time of pinching, 7/11. By August 4, a decided response to increased limestone was noted (Table 1).

Table 1. Length of branches and height of pot as influenced by limestone rate in Peat Plus Two at 5 weeks

	Length of Ave. Branch	Maximum Height
Peat+2, normal	97.6 mm	172.8 mm
2x limestone	113.6	182.8
7x limestone	115.8	197.5
ProMix C control	106.9	165.5

*The TKS formula was supplied by Premier Peat.

**Supplied by Stafford Conservatories, Stafford Springs, Connecticut.

***Supplied by U.S. Vattex Corporation, East Moriches, L.I., New York.

On 8/8 (week 6) the pots were removed from the capillary watering. Weekly fertilization consisted of 345 ppm N from 19-5-24.

At flowering on 9/19 (11 1/2 weeks) all plants including the controls were of high commercial quality (Figure 2). Those with double and seven-fold rates of limestone were more vigorous as indicated by slightly taller growth and larger flower area (Table 2).

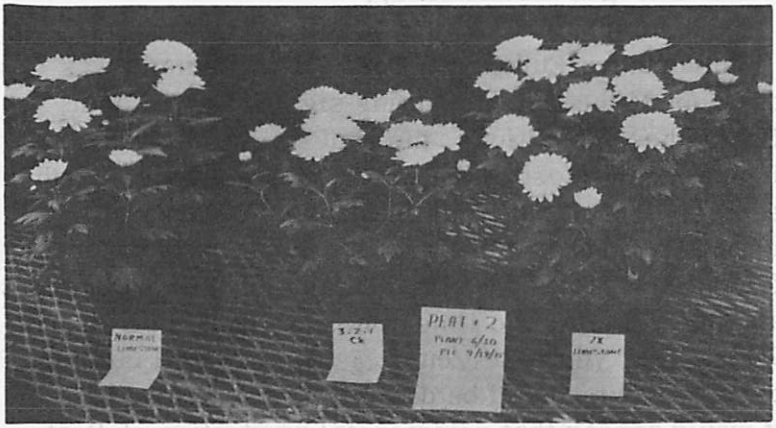


Table 2. Growth of pot mums as influenced by limestone rates in Peat Plus Two

	Height	Number Flowers	Flower Diameter	Calculated* Flower Area
Peat Plus Two, normal lime	35.3 cm	16	8.5 cm	908 cm^2
2x lime	34.0	14.25	9.1	927
7x lime	36.6	17.25	8.8	1049
Controls:				
3:2:1	29.4	13.75	9.2	914
ProMix C +	31.4	15	8.0	754

Calculated by multiplying flower area x flower number.

Soil testing is a valuable tool as developed for soil mixes. The analyses are not as well defined for peatlites or for peat alone. The analyses (Table 3) do show that the normal lime correct the very acid condition. The 2X rate is a bit better while the 7X rate is perhaps a bit too much. The increased limestone rate is reflected in the Ca and Mg rates but not in other nutrients.

It should be noted that the fertilizer for weeks 6 and 11 was suboptimal. Foliage lost the dark blue-green characteristic of early growth except in 3:2:1 due to nitrogen insufficiency.

In northern Europe where the TKS formula was developed, the water contains significant calcium. Under these conditions, the limestone requirement is not great. Most of the water supplies in the northeastern U.S., as well as in many other areas, are low in Ca. More limestone is necessary in the mix for optimal nutrition. On the basis of this experiment and other trials, the limestone rate should be about 27 lbs./cu. yd. (1 lb./cu. ft.). As with soil culture, the limestone should be dolomitic, as least in part. It would appear that commercial production of Peat Plus Two would entail two formulas, the basic one for calcareous areas and one with high limestone for areas where calcium is not abundant in the water.

Table 3. Soil analyses of Peat Plus Two and Controls

	Sol. Salts	pH	Ca	K	P	NO_3	NH_4	Mg
Peat Plus Two, Normal lime								
2 weeks	--	4.8	20	34	1.5	Tr	10	7
4 weeks	12	5.0	--	36	1	0	17	--
12 weeks	10	4.7	10	6	.5	Tr	2	5
Double lime								
2 weeks	--	5.1	30	33	2	2	12	15
4 weeks	16	5.0	30	12	1	0	2	--
12 weeks	12	5.8	20	5	.9	Tr	4	15
Seven x lime								
2 weeks	--	7.0	40	43	1.5	2	15	23
4 weeks	14	6.4	40	17	1	3	2	--
12 weeks	12	7.0	50	4	.3	Tr	2	24
Controls, 12 weeks								
ProMix C	10	7.1	70	10	1	Tr	15	11
3:2:1 Mix	40	6.0	40	10	4	Tr	10	18

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Credit for the fern life cycle which appeared on page 8 of the Connecticut Greenhouse Newsletter No. 70, February 1976, was omitted. This was taken from Growing Ferns, Bulletin 737, of the Cooperative Extension Service, University of Georgia College of Agriculture.