

## FLUORIDE AND EASTER LILY SCORCH

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Fluoride has been implicated in toxicity symptoms in many crops. Scorch on Easter lilies has been a serious problem for decades. Excessive fluoride was overlooked in the early research but has now been implicated by several researchers in causing lily scorch (Juchartz, 1976).

Tizio and Seeley (1976) found that an application of 120 mg sodium fluoride (54 mg fluoride) per 5" pot would induce scorch in two weeks (two weeks before buds could be felt) and increase greatly by week seven. The effect of nitrogen source was studied by applying 15-0-15 (2 calcium nitrate:1 potassium nitrate) or 16.5-0-24 (1 potassium sulfate:1 ammonium nitrate) at approximately 300 ppm N weekly. The nitrogen source did not affect scorch when fluoride was applied but without fluoride some scorch appeared three weeks before flowering when ammonium nitrate was used.

Widmer, Magaas and Wilkins (1976) found that excessive limestone induced tip burn. This is contrary to the literature. But analysis of their limestone disclosed high boron and manganese levels which could cause a tip burn in contrast to the half-moons which develop an inch or so back from the tip in typical scorch.

It is generally recognized that high calcium levels reduce fluoride toxicity in soils (Tizio and Seeley, 1976). This concurs with the standard commercial practice of incorporating sufficient limestone to raise the pH to 6.5-7.0. According to Tizio and Seeley (1976), it would seem that this reduction in phytotoxicity is marginal and that high fluoride levels can override the effect.

Seeley and Monroe (1976) found that applications of sodium fluoride ranging from 40 to 160 mg (in 50 ml water) per 5" clay pot induced scorch. This is a rather high rate. We wondered if chronic applications at lower rates would produce similar results.

A test was initiated 11 weeks before flowering applying 0, 4, 8, 12 and 16 mg fluoride ion in 237 ml (8 oz.) of water per 6" pot weekly. The 4 mg rate (8.98 mg sodium fluoride) in 237 ml contains 16.9 ppm fluoride. The lilies were fertilized with 19-5-24 (51%  $\text{NO}_3\text{-N}$ ) at 344 ppm N weekly until fluoride applications began. No scorch appeared until the eighth week after treatment during bud elongation. Even then it appeared only on a few plants treated with 8 mg fluoride or higher. Not all plants, even at the rate of 16 mg/pot/week exhibited scorch. This scorch was of the typical half-moon variety and was not a simple tip burn such as is generally exhibited by a toxicity such as boron or manganese.

This concurs with a lack of symptoms in another test in which high levels were applied to *Plectranthus* to duplicate reported fluoride phytotoxicity.

It would appear that fluoride phytotoxicity may not be as severe a problem in Connecticut as has been reported in other areas. This could be correlated

with the high rates of low fluoride limestone (over 20 lbs./cu. yd. at times) generally used to raise and maintain the pH above 6.5.

### References

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