

## Managing Magnesium in Turf

While specific research on magnesium use in turf management is very limited, we can make some general recommendations based on information derived from plant nutritional and biochemical studies. What follows are a few such ideas which may be of value and

*Clipping removal depletes magnesium more rapidly than other nutrients because it is translocated to young leaves where it is built into chlorophyll molecules. Remove clippings and your remove magnesium.*

which may prompt some badly needed research on the subject.

1. Include magnesium in your fertilizer program. If applying lime for pH adjustment, use dolomitic limestone which contains from 5-20 percent MgO equivalent. This may cost a little more but it will do much to offset any negative impact adding calcium might have on magnesium uptake.

2. If you are on a turf tissue analysis program, have magnesium included in your analysis and be warned if the magnesium content is consistently less than 2.5 ppm. Such values are not uncommon but may indicate an incipient deficiency especially during periods of rapid turf growth. Remember that most nutrient deficiencies retard growth and plant metabolism before any visual symptoms can be seen. In the case of magnesium deficiency, this may result in secondary effects (weak rooting, drought injury, excessive disease incidence) which are not obviously linked with insufficient magnesium.

3. If magnesium is called for and pH adjustment is not required, consider using Epsom salt ( $MgSO_4 \cdot 7H_2O = 16\% MgO$ ). An annual application of 2-3 lbs Mg per 1000 sq-ft should correct any incipient magnesium deficiency problems.

4. On sand based putting greens, magnesium leaching may be a problem because of

the limited cation exchange capacity. Here a slower release magnesium source would be preferred such as those suggested by Garrett (1996). More frequent lower application rates would be best with a total annual application of about 4 lbs Mg/1000 sq-ft.

5. Excessive magnesium can be a problem because of the fairly critical content required within cells. Also, it is important to retain a proper balance between magnesium and calcium. The trick is to maintain a ratio of Ca:Mg close to 5:1. If tissue analysis calls for magnesium additions, consider the calcium level and try not to deviate from the 5:1 ratio.

6. Organic composts or top dressings will contain some magnesium and these may be sufficient to maintain proper levels once they have been established. Such materials are also not likely to create an improper ratio of magnesium to other nutrients.

7. Clipping removal will deplete the site of magnesium more rapidly than it will other nutrients. Because much magnesium is translocated to young leaves where it is built into chlorophyll molecules, it is lost when these leaves are cut and transported off site. By comparison, calcium is less mobile and comparatively less is present in new leaves and lost in clippings. Retain clippings on the turf and where this is not practical (putting greens and tees) compost them and return as top dressing.

8. When turf is grown on soil with a reasonable cation exchange capacity, magnesium is not likely to become limiting especially if a Mg-containing lime is used. On sandy sites or sand-based greens, the cation exchange capacity will be low and cation retention within the soil profile will not be great. Cation leaching is likely to occur and retaining sufficient basic nutrients in the proper balance becomes more of a problem. Under these conditions, the suggestions offered above are most likely to be useful.