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## Properly Applying Hydrated Limestone to Raise Substrate pH

*When substrate pH drops below 5.4, corrective action is required to adjust or raise substrate pH between the optimal range of 5.8 to 6.2 for most species. Hydrated limestone is one method to quickly adjust substrate pH, and this Alert outlines the proper procedure to do so.*

In the northern US, greenhouse growers are busy growing and finishing crops for spring sales while many southern US growers have finished or are holding bedding plants in wholesale or retail greenhouses. Regardless, as plants mature, water and fertility demand increases, limestone reactivity declines, leaching occurs and residual limestone in the substrate is reduced, resulting in substrate pH drop. Certain crops, such as geraniums, can also reduce the substrate pH by acidifying the substrate by root respiration. To prevent substrate pH drop and thus, iron and/or manganese toxicity, growers should monitor substrate pH and soluble salts [referred to as electrical conductivity (EC)] by easily performing in-house 1:2 Dilution, Saturated Media Extraction (SME), or PourThru procedures. To learn more about nutritional monitoring procedures, refer to e-GRO's [fertdirtandsquirt.com](http://fertdirtandsquirt.com).

Corrective action is required to adjust or raise substrate pH between the optimal range of 5.8 to 6.2 for most annual bedding plant crops. To raise substrate pH within this range, growers can use flowable dolomitic lime, hydrated lime [Ca(OH<sub>2</sub>)], or potassium bicarbonate (KHCO<sub>3</sub>). While on a recent greenhouse visit, low pH of zonal geranium (*Pelargonium × hortorum*) was documented and observed. The grower acted and applied hydrated

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Figure 1. Hydrated limestone applied as a dry topical application. Photo by: W. Garrett Owen

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limestone as a dry topical application (Fig. 1) instead of dissolving and applying the hydrated limestone solution through an injector. As a result of the topical application, the hydrated limestone clumped when irrigation water was applied, making it ineffective in raising substrate pH. Therefore, if one chooses to raise substrate pH by using hydrated lime, please follow this procedure:

1. Mix 1 pound of hydrated lime in 3 to 5 gallons of WARM water (Fig. 2).
2. Mix twice (Fig. 3).
3. Let solution stand and allow the insoluble portion to settle to the bottom (Fig. 4).
4. Decant or carefully pour the clear liquid without disturbing the insoluble solid portion (Fig. 5).
5. Apply the clear liquid through injector at 1:15.

Please note, hydrated lime is caustic (able to burn organic tissue by chemical action), therefore, rinse foliage before it dries (Fig. 6) and avoid skin contact. Results may be erratic. Hydrated lime only supplies calcium (Ca) but not magnesium (Mg) though one should not rely on limestone amendments to provide Ca and Mg nutritional requirements.

For more nutritional monitoring of greenhouse crops, read e-GRO Alert 7-02: [Corrective Procedures for Modifying Substrate pH and Electrical Conductivity \(EC\)](#) and to download a free corrective procedures poster (11" × 17"), refer to "[Corrective procedures for high and low substrate pH and electrical conductivity](#)".



Figure 2. Mix 1 pound of hydrated lime in 3 to 5 gallons of WARM water. Photo by: W. Garrett Owen



Figure 3. Mix hydrated lime and warm water together. Photo by: W. Garrett Owen

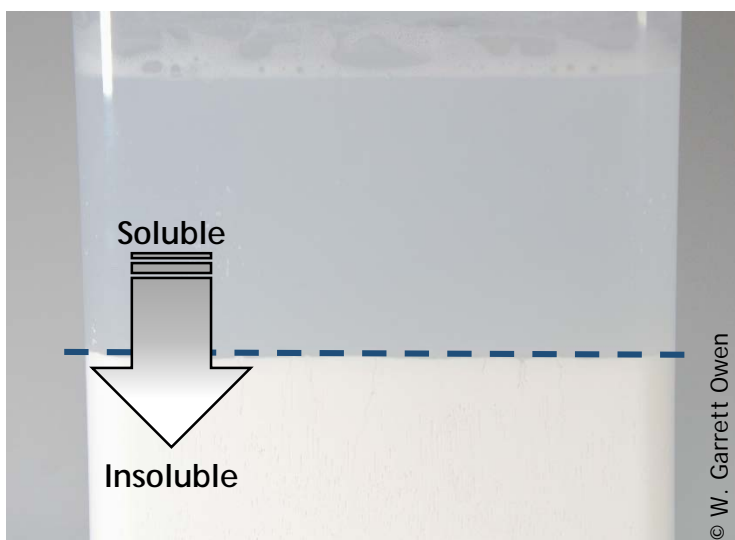


Figure 4. Let solution stand and allow the insoluble portion to settle to the bottom. Photo by: W. Garrett Owen



Figure 5. Decant or carefully pour the clear liquid without disturbing the insoluble solid portion.  
Photo by: W. Garrett Owen



Figure 6. Example of dissolved hydrated lime residue on geranium leaves. Photo by: W. Garrett Owen.

The [American Floral Endowment](http://www.americanfloralendowment.org) is gratefully acknowledged for funding to create [fertiandquirt.com](http://fertiandquirt.com) and establish all available materials.



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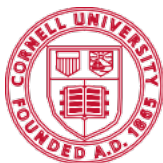
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