

Liquid Fertilizer and Water Quality

Many different minerals are dissolved in our water supply, whether from a private well or a public water system. Water with a high concentration of minerals is often called “hard water.”

When hard water combines with the phosphorus in liquid fertilizer, the two combine to form calcium phosphate, a very strong chemical bond which is very difficult to “un-bond.” This makes it very difficult for the plant to absorb the nutrients in the liquid fertilizer.

It’s easy to see the effects of hard water. For example, a heavy concentration of iron leaves red stains that are hard to remove, particularly if a faucet is constantly dripping. Also, excessive calcium in the water will form a white “ring” of little crystals in water faucet aerators and these crystals can totally close a pipe over time. Excessive minerals in the water is a problem when mixed with liquid fertilizer for use in foliar applications.

Hard water is also a problem when mixed with liquid fertilizer for soil applications as it will keep phosphorus locked up and unavailable to the plant roots. This is a problem for the plant because phosphorus is very important for root growth, flower and fruit production and creating ATP (plant energy).

You can have your water professionally tested to see how hard your water is, but here’s a simple test you can do for a quick result.

- Get a 16 oz. clear bottle that has a cap, and fill it 1/4 full of the water you want to test.
- Add 10 drops of dish detergent (do not use dish washer detergent).
- Put the cap on the bottle and shake vigorously for 30 seconds.

If the water turns a cloudy white color, the water is hard. If the water foams up quickly with suds, the water is not hard, it is “soft water.”

Cost Effective Correction for Hard Water

If you know how hard your water is, you can use the following chart to correct your water to achieve results for mixing with a liquid fertilizer. Of course, you can make small adjustments using this chart, then do the test described above until you get lots of suds quickly.

Soft water will keep your spray equipment from clogging and, most important, you will know that the phosphorous you purchased will be available to the plants. For the most part, softer water makes most foliar-applied nutrients more absorptive.



Hardness		Recommendation	
Grains	Parts per Million	Vinegar	Citric Acid
0 - 5	0 - 87	No Softening Required	
5 - 25	87 - 435	1 Qt per 200 gal	1/4 lb per 1000 gal
25 - 50	435 - 870	1 Qt per 100 gal	1/2 lb per 1000 gal
Over 50	Over 870	Sulfuric Acid - 2 Cups per 400 gal	