

# The Most Frequent Question: How To Improve Irrigation Water Quality

I have received many questions recently regarding irrigation water quality. The most frequent question concerning irrigating water quality concerns the staining of plant foliage, concrete or home siding. Often the culprits in well water causing the stains are compounds of iron or manganese. These minerals cause reddish-brown or black stains on clothes, household fixtures, concrete, plant material, or an other thing that the water contacts. If consumed, these minerals will not harm you but will often impart an unpleasant smell or taste to the water. Iron and manganese compounds are generally not found in public drinking water because most public water supplies are treated to remove these minerals. The Environmental Protection Agency regulates the amount of these contaminants allowed public water supplies.

The four forms of iron commonly found in drinking or irrigation water are ferrous, ferric, organic and iron bacteria. Ferric and organic forms of iron will color water when first exposed to air. Ferric iron precipitates or settles out of the water, creating reddish-brown, solid particles that then settle out as ferric oxide.

In well water, insoluble iron oxide is converted to a soluble form of ferrous (dissolved) iron. Ferrous iron is colorless but when in contact with the air, it oxidizes to solid particles that then settle out as ferric oxide. This is the "stuff" in your irrigating water that turns your sidewalk, house, trees, leaves or whatever brown!

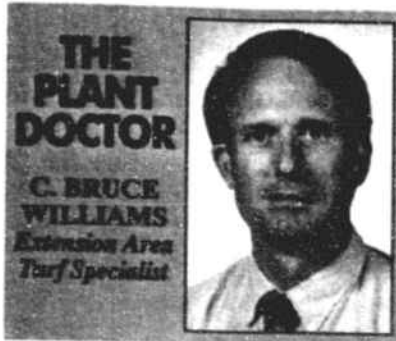
Manganese is similar to iron but forms a brownish-black precipitate and stain. Organic iron does not settle out but tends to turn the water rusty-reddish brown.

Iron bacteria are harmless bacteria that occur in soil, groundwater, and surface water. Iron bacteria appear as a mucous-like substance suspended in fresh water and may be colored brown, red or white. These normally brownish-slimy bacteria can usually be found on the inside surface of nearly any toilet tank or underneath any dripping outdoor faucet.

If you have well water that is causing severe staining, a water analysis should be done to detect the source and scope of the problem. Special steps must be taken to properly sample drinking water, so it is good idea to consider a reputable water treatment company for testing dissolved or oxidized iron or manganese.

North Carolina Cooperative Extension with the N.C. Department of Agriculture offers an irrigation water testing for \$4. Call your county extension office for more information. The extension home economist in your county can give you additional information about water testing and treatment if this is a problem in your home.

Treating irrigation water for iron or manganese can be very expensive. In general, five treatments are generally recognized for water treatment for removal of iron and manganese contaminants. The treatments are water softeners, aeration, oxidizing filters, chlorination and filtration, and complexation. A water softener (cation exchange), oxi-



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or lawn irrigation. These systems are fine for treating household water needs but are often impractical landscape irrigation.

Aeration is the process in which air is mixed with water in such a way to cause the iron or manganese to precipitate out of the water. Farmers have long known that well water containing high concentrations of iron or manganese is best directed to a pond or open holding tank before it is pumped through the irrigation system to the crop.

Dissolved iron and manganese in the well water are easily oxidized to a solid form by mixing with air. This

method adds no chemicals to the water and is most effective in warm climates.

For additional information on water quality, contact your county cooperative extension office for the

publication "Your Water Supply—Well Construction and Protection-AG-469" or "Iron and Manganese in Household Water-HE-394." Send a self-addressed stamped envelope if requesting information or a reply.

Send your gardening or comments to the Plant Doctor, P.O. Box 109, Bolivia NC 28422.



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