What Went Wrong?
By Marge Grimes-Martinovic, Kingman Area Master Gardener

You had such high hopes for your garden this year. You thought you were doing everything right, but for some reason, your plants are not living up to your expectations.

Let's see what could have happened. Overwatering or under watering can be the source of your disappointment. Symptoms are quite similar for both these conditions. Yellow leaves that drop fast may be the result of improper watering.

But let's assume that you are following the correct watering procedures. Let's back up a little and check if the plants were planted correctly.

Was the plant planted as soon as you brought it home? If you could not plant it immediately, did you put the plant in its heat absorbing black plastic container in the shade until it could be planted later? Was the hole dug about three to five times the diameter of the root ball prior to taking the plant out of the container? If the soil was really hard, did you make sure the water would drain from the hole, when filled, in a few hours?
Was the soil from the new hole mixed with compost and starter fertilizer? Was this amended soil used for backfilling around the root ball of the new plant? Did you remove the plant from the container by not pulling it out by the stem?

Did you make sure the hole was wet before you put the root-ball in the hole and buried it? Did you plant it so that the top of the root-ball was at the same soil depth as it was in the container?

Did you water in the plant with the backfill as you were planting it so that air pockets were removed and hot, dry soil was kept away from the root-ball? Did you make a basin around the plant to hold water and then hand water daily for the first week? Did you do this even though the plant would be watered automatically? If you used rock mulch, did you keep the mulch from burying the root-ball and the main stem of the plant?

If you have done all these things, and your plant is not thriving, perhaps the reason may be that it is planted on caliche. What in the world is caliche, you may be wondering. Caliche is a layer of soil in which the soil particles have been cemented together by lime (calcium carbonate.

Caliche is usually found as a light-colored layer in the soil or cream-colored lumps mixed with soil. The layers will vary in thickness from a few inches to several feet. There may be more than one caliche layer in the soil.

Caliche causes three problems in the yard or garden. First, plant roots are unable to penetrate it. Consequently, the plants have only the soil above the caliche to use as a source of nutrients. Normal root development is restricted.
Second, the same conditions that restrict root penetration also reduce water movement. Water applied to the soil cannot move through the soil if a caliche layer is present. Therefore, inadequate root aeration and accumulation of salt in the soil can result. Obviously, this reduces the vigor of the plants.

The pH (acidity or alkalinity) and the free calcium carbonate in caliche soil are high enough to cause iron to be unavailable for plants. The symptoms of iron deficiency are a yellowing of the plants leaves while the veins in the leaves remain green. Iron deficiencies are aggravated by water saturation of the soil.

How can we garden if caliche is present? Try to keep plant roots out of the caliche zone. Put a decorative boulder there. Perhaps a fountain would look wonderful in that spot. A bird feeder may be a delightful addition there.

If you have your heart set on that plant in that spot, it can be done. But first you must remove the caliche and replace it with soil. How do you remove the caliche? You may need an auger to penetrate the layer. In extreme cases you may even need a backhoe. Some people use vinegar to soften the caliche and then dig it out. There are different methods for different depths of caliche.

Once the caliche has been removed, make sure the hole for planting is large enough to accommodate the root-ball of the mature plant. It should be dug completely through the caliche layer so that water will drain form the hole.
If it is not practical to dig through the caliche zone, dig a chimney drainage hole through the remaining layer of the caliche. Partially fill the hole with water and check to see if the water level drops four inches in four hours. If this is the case, the drainage should be adequate. The planting hole can then be filled with a mixture of good soil and compost. Discard the removed caliche.

Have you spotted something in this article that has helped you to produce lush, healthy plants?

**Good Luck!**

For more information contact The University of Arizona Mohave County Cooperative Extension at 101 E. Beale Street, Suite A, Kingman or telephone 928-753-3788.