

## Great Plains Nursery

by C. J. Hohman, Master Gardener

Photos for this article are by C.J. Hohman

I have a confession to make. After we—about 25 Statewide Master Gardeners—arrived at Great Plains Nursery near Weston, Nebraska, and took note of the tidy, attractive surroundings, I realized that yes, it was hot, as befitted an August 9<sup>th</sup> morning. That's not the part that is penance-worthy...hang on... We were addressed by our hosts, owners Heather and Brian Byers, who moved to this place—at the time an old cattle farm—ten years ago. They started their farm, which would grow into Great Plains Nursery, eight years ago. At this point, my first coherent thought was prejudiced and definitely not politically correct because it was, “They don't look old enough to have done all this.” In my defense, I heard a number of other people muttering variations on the same theme. Apparently they are, because they have done.

The focus of the farm is growing native trees and shrubs. Initially they grew perennials, primarily natives, to have something to show and sell and because there were few sources for native perennials. They always wanted to focus on natively grown plants, particularly trees.

The first trees the Byers tried were oaks. Stick an acorn in a pot; how hard is that? (Don't let our hosts see that sentence; their entire operation is based on extensive scientific research.) They did actually begin sort of like that: they began growing the acorns in smooth pots (a certain kind of pot to be sure, with a specialized potting mixture, specific timing, definite fertilizer, etc., in a scientific method) but oaks do not grow well that way. So they switched to planting the acorns first in wooden trays. If they germinate, the seedlings (acorn and all) are put into plastic pots with lots of holes in the sides and bottom. The object is to get more root tips, because these are the parts of the roots that take up water and nutrients. In order to get more root tips, one wants more root branching.

Heather and Brian use a system called Root Makers® which was developed by Dr. Carl Whitcomb at Oklahoma State University. The purpose of the holes in the pots is to air-prune or air-prune the roots. When the smaller pots are full of branched roots, the plants are moved into one gallon pots, also with holes; in the case of the oaks, the trees are planted at the level where the acorn is attached. (A problem with conventionally potted-up trees is that the tendency is to plant them a little deeper each time, so by the time you, the consumer, get it, the root flare may be 6 or more inches underground instead of at ground level where the first roots should be.) Soon these “holey” pots

are full of fluffy roots and the trees are put into three gallon pots, again with holes. By this time, the object is not so much to develop height as caliper. We saw a bunch of trees that were acorns in March that are 3 feet tall and sturdy, healthy looking little bur oaks. A 5-foot red oak seeded in March is in a three gallon pot that is not quite full of roots. Trees get most of their root branching in the first few months of their lives. A potting compound is made especially for them. They use a special formula of fertilizer on new trees, but not after August (just as we are told in the real world). One reason the trees are so tall this year is because it was so hot. Many of these trees are still in the greenhouses, not because they are delicate...in fact, growing conditions imitate nature when possible...but because of the likelihood of wind knocking them over.

They will remove the plastic in mid-August to begin shutting them down for the winter. By the way, these bur oak acorns are from a stand near the chalk mine in Doniphan, Nebraska.

As a rule, the trees are big girls and boys by Fall of the year in which they were sown and go into 7-gallon containers. These are not pots but are grow bags or root trapper bags. These bags are set into pots in the ground. Theoretically, the bag is porous enough that the roots get air to continue to prune them, but sufficiently impervious that the roots do not grow through the fabric. In actuality, they do grow through a little bit, but not nearly in such numbers that one needs to worry about girdling roots. The bags can be put directly into holes in the ground but then one has to be a bit more careful removing them. If

one is too exuberant digging a bag out of the ground it's easy to accidentally pierce the bag and 1) cause root damage which is why you are growing it in the bag in the first place, and 2) you can't reuse the bag (let's be practical here—bags cost money). They do not limb up the trees at this point because they feel that baby trees in windy Nebraska do better with more leaves and branches: they grow to a larger caliper more quickly. They also do not stake the trees except in rare instances because they “like them to have some character”. The whole process of moving trees from one pot size to another is enormously more complicated than it sounds and is based on years of research by Dr. Whitcomb and his colleagues. The Byers have tried several kinds of root pruning systems and feel that this has the most scientific backing and has given them, by far, the best results.

The Byers feel that, esthetically, the young trees need to have a central leader; so if one does not develop naturally, they subordinate a competing branch by cutting off just a small amount



▲ Heather Byers discussing a potted oak. Photo by Cj Hohman.

- continued on p. 5 -



## Great Plains Nursery, from p. 4

of it. Making a competitor just a few inches shorter than the leader not only gets the leader used to leading, it decreases the caliper of the subordinate branch. This may need to be done more than once. Trees grow most rapidly in their first five years, which is another argument in favor of planting small trees vs. large ones. Their 7s (trees in 7-gallon pots) are the most popular selling size tree, and they have the best top/root ratio.

Great Plains Nursery is a wholesale nursery, but they do sell some retail to special people such as Master Gardeners and people who want a few thousand trees for their multi-county lawn. They sell to Fuller Landscape and Nursery in York, Nebraska, as well as to a couple other retail garden centers. They also are growing trees for a project with the City of Omaha this Fall at Spring Lake Park.

Heather and Brian also encourage tree buyers to question their local sources about such things as whether the tree/shrub under consideration is native to the area where it will be planted, what the seed source of the plant is, and where the plant was grown. Some nursery personnel can actually answer those questions or at least don't look at you like "What ratabaga did he just crawl from under?" As more people question, and refuse to buy if the answer is not satisfactory, the more the suppliers will be encouraged to stock what we want. Now there's a thought. And the Byers reiterate: don't be afraid to LOOK AT THE ROOTS of a plant you want to buy. Would you buy a car without looking under the hood? I'll risk belaboring the point by repeating:

- If the seed source is tropical and the tree was grown in the red earth of Tara, chances are it will not thrive in Nebraska.
- Native plants generally thrive in native conditions, and are better for pollinators and native birds and animals.
- If the roots are unhealthy or dead before you buy the plant, they aren't likely to make a miraculous recovery, unless your yard is in Lourdes.
- Girdling roots won't spontaneously ungriddle, nor can they be coaxed. It's not like getting a curly-hair-relaxing lotion. Nor can they be beaten into

submission.

- If a tree has no roots on one side, it will eventually fall over.
- Fall planting is best for a tree — any time from the end of August until the end of October. March is also OK, if spring has been "normal". Anyone know what Nebraska Normal is?

We also had a tree planting demonstration. Have the hole-digging fairies dig a hole the depth you want to plant the tree and about three times as wide. Stand in the shade and let someone else do the heavy lifting in the sun. Go have lunch.

Speaking of lunch, since this was a statewide MG event, Terri James, the State MG Coordinator, fixed a tasty lunch and provided entertainment. Well, she didn't *eggsactly* do the entertainment. The Byers have a couple of pretty roosters which are either friendly or aggressive, depending on how you feel about roosters, and they both have groupies, and that's no yolk! Some diners egged them on, while others had their feathers ruffled and scrambled for the rear.

Let me fill in some background gaps. The Byers's whole purpose in growing trees is to get healthier, longer-lived trees. To that end, they grow their trees from seeds collected all over the state (including red oak seeds from Hanscom Park in Omaha), and they keep records of the parentage of the trees they grow. They do much of their own seed collecting, beginning in September. The Byers have two young daughters and make family trips, going to native wild stands if possible, hiking or backpacking when necessary. Seeds gathered directly from the tree are usually of better quality than those on the ground, and champion trees or those with specific resistances or great qualities are desirable. They work with Bob Henrickson from the Nebraska Statewide Arboretum, and with land owners and homeowners if they see something worth perpetuating. If this sounds like something you would like to do, remember, as Henrickson always says, "Ask permission. The worst they can do is say no." (He must be forgetting about the shotgun, the vicious dog and the attack iguana.)

Once the seeds are collected, they should be cooled as soon as possible. The Byers take picnic-type coolers with them, and have a walk-in cooler at the farm. If



▲ Seedlings in this greenhouse are protected from being knocked over by wind. The pots have holes in their sides to air-prune roots.



▲ Brian Byers and employee Kendra Bretschneider demo the assembly line for moving seedlings from 1 gal. to 3 gal. pots.

the seeds get too hot, begin to germinate and the radicle dies, the seed is cooked, in more ways than one. Each year they try to get 100 to 200 pounds of seed to keep over the winter to plant the next spring. Of course, some years they get nothing, in which case they play gin rummy all spring. Some seeds, such as yellowwood and tuliptree take more work. They also collect seeds from shrubs or do cuttings from them.

A couple of us were asking about particular types of trees, so an employee,

- continued on p. 6 -



## Great Plains Nursery, from p. 5

Brian Bale, gave us a golf cart tour of the various tree areas. (This is too weird: half the full time employees of Great Plains are named Brian B. Well, there are only 4 full-time employees, but still...I can't leave anyone out—the other full-timer is Kendra Bretschneider. Apparently one's last name has to begin with B.) On the regular tour, I got the impression that the



▲ Overview of the growing fields.

majority of the trees were oaks of various types. Wrong. We saw many different kinds of oak, to be sure, but also catalpa, aspen, tuliptree, redbud, yellowwood, willow, maple, sycamore, serviceberry, pawpaw, osage orange, hickory, elm, black gum, a limited selection of evergreens, and a number of shrubs.

We did get a tree planting demonstration. Dig the hole as described. This tree was in a grow bag, so peel the bag back enough to get the tree and root ball out. (If you can do this and save the bag, all the better.) Fluff the roots a bit, and put the tree in the hole. Put the soil back (the same soil you dug out—no amendments). Use the extra chunky sod or big clods to make a berm outside the planting area to catch rain. Plant the tree a bit high to allow for mulch; the soil level of the tree as it was in the ground or pot should be the ground level that it ends up. **Do not:** place it at the correct level in the

soil and then pile 3 inches of mulch on top, or heaven forbid, the dreaded mulch volcano. **Do:** Water the tree and add soil if the level sinks. **Do not:** stomp the soil around the tree, hit it (tree or soil) with the shovel, or drive your pickup over it. At Great Plains, as I said, they generally do not stake trees; if it is in a windy area, stake in order to keep the root ball from moving—we want the top to move. Use something flexible to attach tree and stake and remove stake and whatever you put around the tree within one year.

Do as I say, not as I did. Years ago, I staked a tree in a windy area and faithfully removed the stake. The old nylon I tied around the tree, however, was the same color as the bark and I did not even notice when the bark grew around it. It was a dark and stormy night when the whole top half of the tree blew away, cut off as neatly as an axe by that strangling piece of legwear. ■

## MG POP QUIZ

by Mary Anna Anderson, Master Gardener

**TOPIC:** Symptoms of disease and insect damage of plants. (Often confused with signs of disease and insect damage.)

**HINT:** Refer to UNL Extension EC1270 "Signs and Symptoms of Unhealthy Plants", online at <http://extensionpublications.unl.edu/assets/pdf/ec1270.pdf>

- The symptom of "window paning" on a leaf is typically caused by:
  - a chemical injury to the leaf surface.
  - stippling from white flies.
  - ring spot disease.
  - damage from sun exposure.
  - sawfly feeding or early stage of caterpillar feeding.
- A plant has a symptom of "bottle brushing." This is:
  - major roots of a plant with numerous short, stubby secondary roots.
  - branches with stubby leaves whorled around twigs.
  - the symptom of tip blight in pine trees.
  - flowers of a grass plants that have thickened, tight seeds.
- Chlorosis is a yellowing symptom of leaves that usually indicates:
  - early fall coloration.
  - an over-abundance of nutrients.
  - a nutrient deficiency.
  - insect activity.
  - aphid damage.
  - This is not a symptom. It is a sign.
- The thickening and cupping symptom of leaves on a redbud can be due to a virus, but the most common cause is:
  - excess rain or overwatering.
  - heat damage.
  - herbicide exposure.
  - too much direct sun.
  - This is not a symptom. It is a sign.
- Sand-blasting is a symptom of:
  - strong, dry winds causing dust abrasions on leaves and stems.
  - insect mouth parts superficially scraping plant leaf surfaces.
  - a viral disease.
  - a bacterial disease.
  - phytotoxicity.



▲ Leaves of a redbud, *Cercis canadensis*, showing cupping. ...

### Answers:

- e
- a
- c
- c
- b

