

PNP

PACIFIC NUT PRODUCER

Cloned Walnut Planting Update

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Clonal Walnut Planting Follow-up

Growers Shed Light on their Experiences

By Patrick Cavanaugh, PNP Editor

Editor's Note: Last January, we reported on an August 2007 planting of a 38-acre block of clonal walnut rootstock by growers in Kings County. The potted plants were as small as four inches tall and had diameters smaller than a pencil. The growers, Don and Jeb Headrick struggled to get the plants settled in and growing before winter dormancy. This is a follow up story on how the trees are today and what the Headrick's did to get them there. We also gratefully acknowledge UC Cooperative Extension Farm Advisor Bob Beede for his contributions and help in preparing this article.

It was test of timing. When Don and his son Jeb Headrick ordered up Vlach walnut clonal rootstock from a nursery in 2007, the plants were ready for delivery in mid-August, hence their planting date was very unconventional. The young rootstocks were then hammered by hot weather, which pushed the trees to their stress limits.

With a quickly laid-out drip system and a weed control plan, the young walnuts survived the late summer heat, but grew very little above ground. They were still about four inches tall going into dormancy. Throughout the late fall and winter months, the Headricks held on for the hope of a good restart this spring.

The vernal equinox did happen and spring arrived. As 2008 temperatures warmed up, the rootstocks grew vigorously. Trunk calipers increased, leaf color was good, and branches lengthen. The trees, purchased from Duarte Nursery, reflected the hope that the new clonal rootstocks

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Don Headrick, left, and his son Jeb in their Kings County orchard



Headrick's 38-acre orchard has the promise of clone uniformity, and production.

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will be superior to standard seedling paradox.

Walnut growers know that the typical nursery tree is derived from a rootstock produced from seed and grown a full season in the nursery before being whip grafting in February of the following year. The graft then grows during the second season, and the tree is dug during winter dormancy. Growers then take delivery shortly thereafter, and plant the bareroot trees between February and March.

Duarte Nursery, located in Hughson, California, is one of several walnut propagators exploring the best management practices for clonally propagated material. Because these plants are created in a sterile laboratory environment, their hope is to avoid the conventional growing system, and sell growers small potted rootstock as soon as it can survive transplant to the field. The advantages of this system include meeting the presently high demand for walnut trees, and elimination of the possible exposure to crown gall during the standard production program. "The disadvantages to this system are that walnut growers now become nurserymen, we do not yet know the versatility of planting times for this material, there is no opportunity to rogue-out plants with poor root architecture, and cultural practices must be changed considerably to properly care



Doug Verboon, left, with Bob Beede, UC Farm Advisor, has shown that cloned plants planted at the right time, in this case late February 2008, can get to a respectable size.

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for potted plants", said Bob Beede, UC Farm Advisor for nuts crops in Kings and Tulare counties.

The excellent vigor shown by the clones this spring got the Headrick's thinking about T-budding the stocks to Chandler around June 1 to avoid the one-year delay in production associated with planting ungrafted trees. Production of June-budded walnuts is the specialty of Bonilla Walnut Nursery in Modesto, but it requires skilled budders to achieve a commercially acceptable take.

"We had Alvero Garcia, a T-budder from Kerman, Calif. with a good reputation come by and look at the trees in late May. We decided they really did not have sufficient girth to do the job in June," said Jeb. "We asked him to check back later and see if we could get it done."

By mid-July the trees were big enough for budding. So Garcia's team

came in and T-budded July 24. The results were an 80 percent take. Failed buds are destined for whip grafting in the spring of 2009.

“Two weeks after the budding we headed back the rootstock to about eight inches above the bud, and also notched the bark above the Chandler bud using a hacksaw blade. We then carefully monitored our irrigation schedule to force the bud,” said Jeb.

“We hoped the Chandler buds were going to grow an inch per day so that by the end of summer we would have a ten-foot English whip to head back in the winter. Instead, the buds remained alive but failed to grow. We were hesitant to keep suppressing the rootstock re-growth, for fear that we would weaken the trees and make them susceptible to winter kill this fall,” Jeb noted. “Had we known the difficulty we would face in pushing the Chandler buds, we would probably have forgot T-budding, and simply grown the rootstock for whip grafting this coming February. Now, we’re hoping the June buds will push this coming spring after dormancy.”

By late September, the orchard looked very stout and did not show signs of the challenging start. “The trees are uniform and vigorous with a promising

future of high production, especially since clones are less likely to be exposed to crown gall in a nursery,” said Jeb, adding, “We think the block will eventually give us four tons per acre.”

“Again, the reason we went with the clonal rootstock so early in its development is because in talking to nurseries, it was going to be 2010 before we would get conventional plant material plant, noted Don Headrick. “We were interested in the clones because of their improved genetics and we did not want crown gall in our orchards.”

The current success of the orchard block was not without new and unexpected challenges. Last fall, the Headricks planted an oat hay crop down the middles of their young trees, to generate some income from the land, which has only been demanding money. The hay crop attracted a heavy population of false chinch bug (FCB), and they descended on the young walnut trees with grand velocity after it was harvested. Chinch bug is not a typical pest on walnuts because the crop is usually planted

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False Chinch bugs caused quick death to several of the “short” walnut trees this spring at the Headrick’s operation.

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When to Plant Small Clonal Material

Time of Planting Trial Sheds Needed Light.

The mid-summer in-field clone planting experience of the Don and Jeb Headrick has prompted a discussion of when is truly the best time to plant this material. As it turns out, research by Bob Beede, UC Cooperative Extension, Kings County, suggests that the size of the plant material and the time of planting are important to grower success. The concerns regarding mid-summer planting of small clonal material prompted Beede to conduct a small timing study, where he compared four different planting dates: mid-August 2007, mid-October 2007, mid-January 2008, and mid-April 2008. At the Headrick ranch, Beede laid out a replicated trial of successive plantings using plant material provided by Duarte Nursery. . Common cultural practices were maintained on all plantings, leading to the following results.

Beede's study shows that the mid-August planting is comparable to the field plantings on the Headrick ranch. August plants grew very little above

ground, but survived very well over the winter. Excavation of three trees in the late fall revealed a very large root system relative to the small top. The rapid and vigorous growth the following spring suggests most of the photosynthate was going into storage and root development.

Clones planted in mid-October varied in size, with the smaller plants succumbing to winter kill. Beede said that 20 percent of the mid-October plants died due to cold injury. He said it appears that the mid-October planting were more likely to survive if their calipers were about one-quarter inch in diameter. Those plants having survived the winter grew well in the spring, but not as vigorously.

The mid-January planting also varied greatly in its success. "The principal threat to the January planting was cold injury," said Beede. "The plants that we obtained were very small-about one-eighth inch in diameter and we lost nearly 50 percent of them. This is not

to say that January plantings will not work, but rather that larger plant material having gone through dormancy in the nursery is required."

Beede said that hot capping tender dormant plants might be wise to protect them during cold nights. "The empty pots make great hot caps," Beede said.

The mid-April plantings survived very well, with growth second only to the August planting date. "It appears that April is a safe and successful planting date for the clonal rootstock.

Beede said the bottom line for this small trial is that some planting dates are better than others and initial plant size significantly affects its early growth rate and survival rate. Plantings in mid to late summer will require close management to prevent water logging or stress. Weed control is also critical and challenging with the green main shoot and low-lying foliage. "It remains to be seen how these plants will do under a furrow or localized flood irrigation method," Beede stated.



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as two year old trees with leaves far off the ground. However, the young clonal material served as an excellent host, since most of the foliage is still very

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Beede's time-of-planting trial has shown early is better than late.

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close to the ground. This Hemipteran insect is about one-fifth the size of a lygus bug, and reproduces by the thousands. Its feeding is so toxic to the plant that they kill it outright. Pistachio growers are all too familiar with the fatal mistake of not controlling London rocket and shepherdspurse weeds in the spring, since these are preferred chinch bug hosts.

While the Headricks were seeing the FCB damage, they were also spraying Surround on the trees to prevent sunburn. The added benefit is that the Surround stopped the chinch bug feeding.

The Headricks are encouraged by the good growth of the clone material this year and the early bud take of the T-Budding. They noted that 2009 should be a strong year for the orchard and will set it up for years of high production. They also hope that the additional effort associated with field planting clonal rootstock will minimize their exposure to future crown gall problems. PNP

In mid-April, Beede took delivery of VX211 clone walnuts for the fumigation trial, which did not receive winter chill, and thus did not progress well.



The Walnut Replant Trial

Clones Tested Against Fumigation

Third generation walnut grower Doug Verboon, Gold Top Ranch, Hanford, took the plunge with UC Farm Advisor Bob Beede to compare seedling paradox rootstock against VX211, a clonal paradox screened by UC researchers for nematode and root disease susceptibility.

The big question is: Can VX211 overcome the walnut replant problem without fumigation? "Time will tell," said Beede. "Doug has graciously committed 13 acres to help answer this critical question, which is especially important now that the State is making it increasingly difficult to preplant fumigate". "I subscribe to the conventional planting system," stated Verboon. "It has worked well for my family, and I know how to manage it. These tender clonal plants are a lot of extra work, and I would not have considered them if I could have gotten enough standard two-year old trees. Even with six-row corn grown in the middles, I can grow a 14-foot whip on a standard tree the first season. I was doubtful the clonal plants in the fumigation trial would get big enough to graft this coming season." In addition to standard trees, Verboon also planted a single row of Vlach clonal rootstock from Burchell Nursery as a comparison on February 28.

Beede shared Doug's concern, especially after having to replant the entire trial in early May. "The first VX211 plants we received in mid-April were only about two inches tall. I had doubts they were going to survive," he noted.

The nurseries are still trying to figure out how to best propagate VX211. The thought was that it would take off once in the field, but we later learned that they require a chilling period just like standard trees," stated Beede. "To save the trial, we acquired plants from Vitrotech in Spain through Burchell Nursery. They have grown well, since they were eight to ten inches tall upon delivery and had received their chilling requirement. However, it was early May by the time we received them, so it was a race to establish them before the corn got too tall."

"Our experience indicates that it takes about six weeks for these plants to hook up before shoot growth occurs," continued Beede. "They have to establish enough root mass first." Knowing the challenge faced with the late planting, Beede grew them using a makeshift drip system and light (but frequent) fertilization.

Weed control became a nightmare. "We could not take the risk of having the clones damaged from pre or postemergent herbicides," said Beede. "There were a lot of sweaty days with shovels and hand trowels." The hard work paid off, since most of the trees are now five to six feet high and graftable next spring. The clones are also more uniform and vigorous than the seedling paradox. Any conclusions about the value of fumigation are still premature.

"One thing is certain for me," said Beede, "The closer you plant clonal material to the traditional February timing, the more successful you will be. Look at the single row of Vlach clones Doug got from Burchell and planted next to the fumigation trial on February 28. They are 14 feet high, compared to the Vlach clones I planted as buffer trees in May, which are only five to six feet. Farming hard just will not make up for the nine weeks of spring weather lost from a late planting date." PNP

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