

## Lethal Paradox Canker sampling begins again in Tulare County



Photo Caption: Dr. Greg Browne samples a Tulare County walnut orchard for lethal paradox canker.

Last week, Dr. Greg Browne, Research Plant Pathologist, USDA ARS, and I visited Tulare County walnut orchards affected with lethal paradox canker (LPC). The cause of LPC is yet unknown. Although it is commonly thought that the disease is caused by a microorganism, a causal agent has not yet been resolved. Because the cankered tissues have not yielded consistent putative causal agents in culture, Dr. Browne's research group is exploring new techniques to investigate the cause of the cankers. Research conducted by Dr. Hossein Gouran, a post-doctoral associate in Dr. Browne's laboratory, is examining LPC samples using metagenomics approaches. Metagenomics is the study of genetic material recovered directly from environmental samples.

Early symptoms of LPC may include small bleeds on the rootstock and a general canopy decline, but the canker may eventually envelope the rootstock, girdling the tree and causing mortality. In Tulare County, the most recent reports of LPC have been in 'Tulare' and 'Chandler' blocks, and generally in orchards ranging from approximately 10-15 years old. Disease incidence has reached approximately 6% in some affected orchards but is typically less than 1%. Because the disease is observed in mature orchards, shade from neighboring trees can complicate replacement of LPC-affected trees. Also, although trees used to replace LPC-affected trees have not been observed to express the disease, the replacement trees are subject to disease caused by replant pests such as plant parasitic nematodes.