

## Microbial soil inoculant tested on walnut crown gall

*Joe Grant, Farm Advisor, UC Cooperative Extension, San Joaquin County*

*Dr. Dan Kluepfel, USDA-ARS, Davis, California*

In early 2011, we became aware of the soil inoculant product Bio-S.I.<sup>TM</sup> (Bio-S.I. Technology, LLC, Justin, Texas) and heard accounts suggesting it was effective in controlling or eliminating crown gall from trees infected with this damaging bacterial disease. In May 2011, we initiated a small replicated trial in a Linden area orchard to test this product on crown gall. At that time, the test orchard was in its second year and had a very high incidence of severe crown gall infection.

In late May 2011, after air-excavating the soil around the crowns of 150 trees to expose the galls present, one of three experimental treatments was assigned at random to each tree with crown gall:

1. Surgery: Galls were removed surgically using a sharp tool and the healthy appearing bark ring around the excised gall area was “burned” with a propane torch to kill any remaining viable bacteria;
2. Intact/exposed galls were sprayed generously to run-off with a 1.25% water solution of Bio-S.I.<sup>TM</sup>;
3. Intact/exposed galls were sprayed to run-off with water (Untreated “water control”, the proper scientific comparison for Treatment #2).

Each treatment was applied to 50 trees, separated into ten five-tree plots. Treatments #2 and #3 were repeated every 14 to 16 days for approximately 1 year - a total of 26 applications.

Treatment effectiveness was evaluated in three ways:

1. By measuring tree trunk circumferences periodically to see if treatments would improve tree growth;
2. By visually inspecting trees for the presence or absence of galls at the beginning (late May 2011) and end (early August 2012) of the experiment;
3. As we had heard testimonials claiming that Bio-S.I.<sup>TM</sup> -treated galls could be expected to “decompose and fall away”, a soil penetrometer was used to measure the “resistance pressure” required to push the pointed metal probe of this instrument into the exterior surface of galls.

There were no statistical differences among the three treatments in their impact on tree growth (trunk circumference) or resistance of galls to puncturing pressure, so these results are not presented here. Bio-S.I.<sup>TM</sup> treatment did not reduce gall incidence. The

Treatment	% of trees with crown gall	
	May 2011	August 2012
After surgery	0%	84%
Bio-S.I. <sup>TM</sup>	100%	100%
Water	100%	100%

table to the right shows the incidence of crown gall at the beginning and end of treatments. Galls re-developed on a large percentage of trees where galls had been surgically removed and the intact tissue around the cut area “burned”. This is a much lower success rate for this treatment than is normally seen. We do not know why it occurred but suspect that the surgery performed did not remove all infected

tissue and/or that the torch heating was insufficient to kill all bacteria and infected cells that may still have been present after the surgery.

