

**ORCHARD HILL FARM/ORCHARD SPRAY PROGRAM  
FARMER/GROWER GRANT FINAL REPORT  
FNE01-370**

2. The goal of the Orchard Hill Farm spray program was to demonstrate a safe, effective, and alternative control of the pest plum curculio (*Conotrachelu nenuphar*) by the use of kaolin based spray instead of a chemical based spray.

3. No significant changes have occurred;

4. Our collaborators for this project were the following: Deborah Hinnman with the Natural Resource Conservation District, Chesire County and Ron Desrosiers with NRCS/USDA. Deborah Hinnman assisted with outreach and promotion of our demonstration day and Ron Desrosiers acted as an advisor for our application.

5. Orchard Hill farm was successful in accomplishing the goals of the grant. As stated in the grant application, in late fall, we concluded a detailed orchard sanitation project, laying of compost beneath the trees, maintaining a rock mulch at base of trees, and we completed a wood mulch under 50% of the orchard. In spring through summer the farm manager conducted 8 weekly sprays of the orchard with 'Surround' kaolin spray, starting in early may, a break of two weeks, then concluding in late July. 50 pounds of clay to 100 gallons of water was used in the first 6 sprays, with a concentration of clay at half for the final sprays in late July. Fish emulsion and kelp were added to the first 3 sprays to increase foliar nutrient intake and early growth in the spring. Orchard Hill Farm did not buy pyramid traps, but maintained visual inspection of orchard for pest occurrence and consulted an apple grower web site for latest information on pest movement and emergence. This fall, we expect to finish the mulching of the orchard and begin the sanitation project anew.

6. Our initial findings of the project are as follows:

- Due to an unusually wet, early spring more applications of kaolin spray were necessary to maintain an effective barrier on the trees;
- In the apple trees over 10 feet, it was difficult to effectively coat the tops of trees with the kaolin spray, and necessitated use of a handgun attached to our sprayer;

- The spray was effective in keeping plum curculio damage down or equal to levels experienced using two applications of Imidan in previous years; a count of 4 scarred fruit per hundred in a random sampling.
- The kaolin spray was effective in deterring, pear psylla, and even may have helped in holding down scab infections in the orchard; there was lighter scab pressure than usual this growing season.
- Initial yield estimates seem to show higher quality, better color than that of the 2000 season; improved weather conditions are at least partly responsible but higher percentage of fruit free of pest damage is a clear sign of Surround's effectiveness.
- Style of pruning has a definite affect on the coverage of the kaolin spray (i.e. a heavier foliated tree makes for a difficult even application, whereas a more defined, pruned tree receives more even coverage);
- Initial customer response to the clay on the apples seems to be positive, given sufficient information and education on kaolin based sprays; the remaining residue was light, visible but easily removed by washing or rubbing off.
- The kaolin spray proved **very effective** in preventing pear psylla damage in pears; our pears were the cleanest and best finish we've seen in years.
- Varietal choice of apple trees is **extremely important** in overcoming pest and disease problems;

7. Heavy weekly rains caused the need for extra sprays early in the season, and slower buildup of Surround on the foliage and fruit than expected.

8. We found that using the kaolin spray was more costly in dollars and in manager time than doing nothing or using chemical. Part of this observation was due to the need for extra applications due to the heavy rains. Also, upon talking with 'Surround' representatives, some orchards are using a lower concentration spray later in the season, which would also decrease costs. While the costs of labor might increase, it is a necessary compromise to using chemicals and their long-term side effects. Another potential increase in costs is effects of the clay on equipment. The clay is fine and can work its way into equipment parts and joints possibly causing problems.

9. We would like to compare our findings with someone using the kaolin spray in a dryer climate. There would be a significant difference in application rate and labor costs. Also, we are interested in exploring how the kaolin spray might be effective in preventing damage to apples from apple maggot, codling moth, and apple scab. Our next step will be to use the kaolin spray for a couple of years to see how pest populations balance out, and to try less concentration of kaolin spray later in the season to reduce costs.

10. Yes we will continue to use the kaolin spray as we feel the long term costs of using chemicals is greater than the short term costs of using the kaolin spray. Additionally, the clay is much simpler to use than the chemical alternative and safer for all concerned.

11. Our outreach included a demonstration day (see photos), a picture journal, and reports sent to area conservation districts, new farmers clubs, and NOFA/NH.

Anton C. Elbers

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