2012 SCRI MATCHING FUNDS Minigrant Proposal

**Title:** Alternative chemicals for psyllid control  
**Program Focus Area:** Pest Management  
**PI:** John Trumble, Department of Entomology, University of California, Riverside  
**Collaborators:** G. Kund and B. Gonzalez (UC Riverside)  
**Research Location:** University of California's South Coast Research and Extension Center, Orange Co., CA  
**Funding Period:** approximately February 2012 - December 2012

Need: We currently rely very heavily on a select group of insecticides. There is a need to reduce the expense of pest control as well as to provide growers with as wide a range of insecticidal choices as possible. At the recent meeting in San Antonio we reported on a comparison of Platinum and Admire Pro using 'in furrow' application at planting. The results of the 'in furrow' application were so variable that it was apparent that alternative application methods would likely increase the effectiveness and longevity of these materials. We are proposing to test several different application strategies and measure concentrations of the major compounds and key metabolites in the foliage. In addition, we will conduct more extensive field trials with alternative strategies such as repellents. As reported at the last SCRI Annual Meeting, repellents appear to offer promise for incorporation into IPM programs. The experiments examining repellents will provide critical information on how to repel adult psyllids before they land and transmit the ZC pathogen as well as potential interactions with pesticides.

Objectives:
1. Determine if the efficacy and longevity of soil applied Platinum and Admire Pro can be extended by changing from 'in furrow' applications to other application strategies.
2. Determine the potential field value of repellents based on smell (sprayable wax formulation with repellents). The most successful materials lab trials will be incorporated into an IPM program.

Approach:
Objective 1. Platinum and Admire Pro will be applied 1) 'in furrow' at planting, 2) as a seed treatment, 3) through the drip line approximately one week prior to plant emergence, and 4) using a surface banding approximately one week prior to plant emergence. Foliage will be collected at 2 week intervals for at least 6 weeks and analyzed for Platinum (thiamethoxam and key metabolites) and Admire Pro (imidacloprid and metabolites) using a published ELISA program. All field trials will have treatments arranged in a randomized block with four replications. Statistical analyses will be conducted with ANOVA followed by an appropriate ad-hoc test.

Objective 2. In our preliminary studies a commercial sprayable wax formulation impregnated with a repellent reduced landing by as much as 90%. We will test the top three repellents from our lab trials in field trials with and without an IPM program. All field trials will have treatments (including an untreated control) arranged in a randomized block with four replications. Weekly or bi-weekly samples will be taken for numbers of psyllids based on the sampling program published by Butler and Trumble (2012). At the conclusion of the experiment the presence of ZC
in tubers will be determined with real-time PCR as well as frying. Statistical analyses will be conducted with ANOVA followed by an appropriate ad-hoc test. A partial budget economic analysis will be used to determine the economic return from the use of the repellents alone, the IPM program alone, and the IPM program in conjunction with the application of repellents.

Expected Outcome: If successful, the employment of the alternative strategies will reduce production costs, minimize the need for pesticide use, and reduce the potential for resistance development to pesticides. If the repellents alone prove useful, this could be used during the late season to reduce transmission, and in organically produced potatoes. The test of repellents with and without pesticides will provide critical information on the interaction with pesticides.

Requested Funding: I am requesting $34,982 for this research (with no IDC). This will cover the planting costs, field costs (irrigation, fertilizer, weed control, etc.), pesticides, and costs of ZC analyses and ELISA kits for determination of pesticide concentrations in foliage.

**Budget**

**Wages**

30,471
- 3.5 mo. of salary plus benefits for Mr. G. Kund for oversight of planting, field applications of pesticides (he has a CA Applicator's Certificate), sampling, and data recording = $23,587
- 2 mo. of salary for B. Gonzalez (lab helper) = $6,884, help with all aspects of the project except pesticide application

**Equipment**

0

**Supplies**

3,500
- Elisa kits for determining concentrations of pesticides in foliage, drip lines, PCR analyses, pesticides

**Travel**

0
- not requesting funding for this category

**Other**

1,000
- Cost of research plots and water at the UC South Coast Research and Extension Center

**Total**

34,971