California Department of Food and Agriculture
2013 Specialty Crop Block Grant Program

Plant Health and Invasive Species Impact Mitigation

California Department of Food and Agriculture ***$285,896***

Title: Biological Control of the Brown Marmorated Stink Bug

Abstract: To provide a sustainable, cost effective management tool for control of the brown marmorated stink bug (BMSB), a new, invasive pest to California. This pest was introduced from Asia to the Mid-Atlantic States in the mid 90s. It is now established in Oregon, Washington, and has been reported in 7 cities in southern California, and one site in northern California. The BMSB has the potential to spread throughout most of the growing regions in California and has a wide host range, including fruit crops, vegetable and field crops, and woody ornamentals. BMSB's piercing, sucking mouthparts discolor fruit, which in turn makes them unmarketable. State-wide surveys will include early detection of BMSB, their spread, host plant associations, and any natural enemies found attacking them. California Department of Food and Agriculture will release newly discovered parasitoids from China, once host range tests conducted at UC Riverside are completed.

The Regents of the University of California, Berkeley ***$277,387***

Title: Release of a promising natural enemy for biological control of olive fruit fly

Abstract: Olive is a unique California specialty crop. Olive fruit fly (OLF) is the most destructive olive pest; current management strategies rely on frequent insecticide applications targeting adult flies. This increases farmer costs and may result in the development of insecticide resistance. Moreover, insecticide effectiveness is limited by the presence of abundant ornamental or landscaping olive trees that act as reservoirs for OLF populations. To develop sustainable, area wide management strategies, with previous Specialty Crop Block Grant Program funds the Regents of the University of California, Berkeley (UC Berkeley) imported and evaluated OLF natural enemies, becoming a recognized world-leader in OLF bio-control. UC Berkeley demonstrated, for the first time, establishment of an introduced parasitoid (Psyttalia lounsburyi). Here, UC Berkeley proposes to build upon this success through production and release of P. lounsburyi in California olive regions where it is most likely to thrive. This will ensure the parasitoid's establishment, and provide an opportunity to determine its economic impact.

The Regents of the University of California, Davis ***$392,309***

Title: Mechanisms, distribution and invasion potential of glyphosate-resistant junglerice in tree and vine cropping systems

Abstract: This project addresses California tree and vine industry concerns about rapidly evolving weed management issues related to known or suspected glyphosate-resistant (GR) summer grass weeds. The research team, which includes University faculty, a Cooperative Extension Specialist, University of California Cooperative Extension (UCCE) Farm Advisors, and supporting scientists, has significant experience in herbicide-resistant weed research. During this project focused on GR junglerice, multiple scientific approaches ranging from the lab to the field will be used to develop new information on the distribution, biology, physiology, mechanisms of resistance, and invasion potential of emerging GR summer grass weeds. The overarching goal of this project is to develop practical weed management practices that enhance the productivity and sustainability of California orchard and vineyard cropping systems.

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The Regents of the University of California, Davis ***$349,817***

Title: Development and implementation of a strategy for durable resistance to lettuce downy mildew in California.

Abstract: The Regents of the University of California, Davis
will determine the variation and variability of downy mildew, the most important pathogen of lettuce in California, using high throughput DNA sequencing. This information will be used to identify effective new resistance genes that will be bred into advanced breeding lines suitable for California. This will provide a strategy for durable disease resistance than minimizes dependency on chemical protectants and aids organic farmers.

USDA, Agricultural Research Service ***$201,342***

Title: Characterization of resistance in cantaloupe and honeydew to Cucurbit yellow stunting disorder virus and sweetpotato whitefly

Abstract: Cucurbit yellow stunting disorder virus (CYSDV) and its vector, the sweet potato whitefly (SPWF), have virtually eliminated fall season production of cantaloupe and honeydew melons in the lower desert of California. Three non-sweet, vegetable type melons (NSVM) have high-level host plant resistance (HPR) to CYSDV; two of them have low-level HPR to SPWF. More than 12 putative new sources of HPR to CYSDV were identified from 2009 to 2011. Five of them were confirmed in 2012. Three of them have higher-level SPWF resistance and several have fruit characteristics of sweet melons and are more similar to cantaloupe and honeydew than NSVM, and may be better donors of CYSDV and SPWF resistances. The best sources of resistance to CYSDV and SPWF will be determined and used to breed CYSDV and SPWF-resistant cantaloupe and honeydew. These sources of resistance to CYSDV and SPWF may also be used for development of melons for California niche markets (Hami, Korean and central Asian melons).