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Production Research:
An Investment in the Future

About five years ago, the California Avocado Commission (CAC) began the process of revamping its approach to investing in production research. The size of the Production Research Committee (PRC) was reduced and they were tasked with reviewing projects based on strategic needs and for increased returns to growers. To this end, the CAC Board defined a set of imperatives in 2011 — a grower-driven research management system, effective grower education, increased average per-acre production, achieving and sustaining critical industry mass, and maintaining a premium quality product.

One of the challenges with production research is that there is often no immediate return on investment in the form of increased grower profitability. Rather, production research is an investment in the future that results in maintained or increased profitability down the road. Ideally, the production research program will lead to improvements in productivity — reduced cost of production, increased yield — and provide the technical support for marketing messages.

In recent years, one of the biggest tasks of production research has been overcoming crises, specifically shot hole borers and Fusarium dieback. The PRC has been diligent in seeking information about this pest-disease complex — seeking consultations with researchers from Israel, sending researchers to Southeast Asia — and allocating resources in challenging economic times. Although the investment in shot hole borer research has been large, more than $2 million since 2012, the cost of not attacking this problem head on would be far greater.

The challenge in dealing with a crisis is how to maintain and even expand existing research to address other challenges faced by the industry — Phytophthora and salinity for example — while addressing the crisis. This has been the dilemma faced by the PRC and CAC Board over the past couple of years. CAC has been diligent in pursuing grant opportunities, wherever they exist, to help offset the costs of shot hole borer research as well as maintain other research priorities. We have been successful in garnering Federal farm bill support for two years for shot hole borer survey and monitoring work. In addition, we have recently forged an unprecedented partnership with the Asociación de Productores y Empacadores de Aguacate de México (APEAM AC) to help address the shot hole borer crisis.

Effective grower education was one of the imperatives put forth by the Board in 2011. Since then many efforts have been made to improve grower outreach and education. One of the biggest efforts has been the development of the Pine Tree Ranch demonstration grove in Ventura County. We have hosted six field days there since spring 2014 and the feedback from growers has been very positive. We recently submitted a grant proposal for a new demonstration project at the site to educate growers about the use of soil moisture and irrigation sensors to deal with the drought by improving irrigation management. The site has also proved invaluable for shot hole borer pesticide research. The testing of unregistered pesticides to develop the needed efficacy data to apply for registration requires crop destruction. Traditionally, we would have sought grower cooperators for this work who would need to be compensated for the destroyed fruit, increasing the cost of the research. By doing these trials at Pine Tree Ranch, we have been able to avoid these additional costs. The decision to take on the demonstration grove was not an easy one, but it has proved to be a worthwhile one.

Another imperative put forth was to increase average per-acre production. One of the ways in which this imperative has been addressed is by revamping the plant breeding program. Inarguably, the two greatest

limitations to productivity in California avocado production are salinity and Phytophthora. To address these issues, CAC made the difficult decision to suspend funding for an active variety breeding program and refocus our efforts on rootstock breeding. This change came about in part as a result of a change of research leadership at University of California, Riverside (UCR). In January 2015, Dr. Patricia Manosalva came on board at UCR as the lead researcher on the rootstock breeding program. CAC has worked closely with Dr. Manosalva to develop the goals and objectives for the revamped program and has committed to providing her with the necessary resources to develop a modern, productive program. Although no longer funding active variety breeding, CAC recognizes the value of the germplasm material that has been built up over many years by Dr. Mary Lu Arpaia and her predecessors. We are continuing to fund the maintenance of that material and are supporting Dr. Arpaia's efforts to secure other funding sources for the variety breeding program.

One of the biggest changes made to the production research program was the decision to provide multi-year contracts to the researchers so they could have some assurance of continued funding for a long term project. There is no better example of this change than Dr. David Crowley's Decision Support Tools project. This project was a seven-year project totaling close to $1 million. Dr. Crowley provided a preliminary report on this project in the Fall 2015 issue of *From the Grove*. In that article he provided revised leaf nutrient concentration recommendations for avocados and guidelines for irrigation water salinity levels. The next step for this project, as it nears completion in December 2016, will be to develop the final Decision Support Tools website. CAC has recently submitted a grant proposal seeking funding to help us achieve this goal and bring this project to its full potential.

Production research is not always the easiest line item to run a cost benefit analysis on. Many of the projects take several years to complete and completion is just the first step. No real value may be realized until the results of that research are communicated to growers and changes in practices start to happen. Recognizing the steps of this process and putting the necessary pieces in place is the first step to realizing the full value of production research. CAC has put those pieces in place with the current production research program, grower outreach and education plans.