



Xerces South Coast Pollinator Mix.

Panel Explores Avocado Cover Crops

By Alli Rowe

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Cover crops in avocados? How do you select species? When do you seed? Do they even work? What benefits do you notice? What are the management issues? These were all questions addressed at an Avocado Nutrition and Cover Crop Usage field day seminar at Pine Tree Ranch in Santa Paula. Hosted by the California Avocado Commission and presented by Ben Faber and Alli Rowe from University of California (UC) Cooperative Extension, the cover crop portion of the seminar culminated in a grower panel of three cover crop veterans. On the panel was Carl Stucky, a seasoned avocado grower in Carpinteria; Mike Sullivan, an orchard manager who dabbles in both organic and conventional systems; and Chris Sayer, owner of Petty Ranch in Saticoy. So, what did we learn?

Cover Cropping History

All three of the growers on the panel had been cover cropping for more than 20 years. As Stucky put it, “Cover cropping is not new. People have been cover cropping for thousands of years.” But how and why you cover crop is completely unique. Sayer started cover cropping to alleviate soil compaction issues that were killing lemon trees. Sullivan was introduced to cover cropping by way of Valencia orange trees suffering from poor soil health and water infiltration. Stucky started cover cropping on a property that suffered from severe soil erosion and loss.

Species selection

Different cover crops can address different issues. Initially, Sayer focused on deep-rooted crops such as sugar beets and daikon radish to break up soil compaction. Recently, he has been using grasses, such as triticale, to build biomass and increase soil organic carbon. Stucky aims for a variety of rooting types and diversity of plants to keep beneficial insects around. "I look for a range of responses and benefits; it is all cumulative," he stated. All growers mentioned mixing it up, aiming for rotating diversity and using selective covers to address specific needs. Agricultural crop rotation provides benefits such as soil fertility, nutrient cycling and erosion control. A permanent tree orchard can't be rotated, yet diversity in cover crop selection allows growers to gain the benefits of crop rotation.

Benefits

Cover crops provide a multitude of benefits based on species selected. Growing cover crops can increase soil organic matter, improve soil structure, enhance nutrient cycling, aid in weed suppression, provide habitat for beneficial insects and pollinators, and build on-farm resiliency to climatic changes.

For growers in Ventura County, improving water infiltration is a noticeable benefit that everyone can relate to. All growers reported issues of runoff prior to cover cropping and have seen dramatic improvements in retaining water in the soil. For a drought prone area and sensitive avocado trees, this could be the difference in surviving a July with a 120-degree heat wave. Pack out comparisons offer subjective records of yield increases on cover cropped blocks. And notable improvement of soil structure offers a compelling case for cover cropping benefits. Using soil map data, Sayer estimates his orchard was around 2 percent organic matter prior to cover cropping. After decades of dedicated cover crops, he now brings soil samples in with



Triticale and Lamb Hoss.



Clover Medic Mix

organic matter topping 5.7 percent. That is almost unheard of in Ventura County. All of that organic matter improves soil structure, tilth, water infiltration and microbial communities to support healthy trees.

Another thing to love about cover crops is their role in nutrient management. Nitrate leaching is a problem of excess fertilizer making its way below the root zone and into water systems. Grasses and brassicas are excellent nitrogen scavengers, helping prevent nitrate leaching to groundwater. Covers of grasses and brassicas take up nitrogen and then slowly decompose, releasing that nitrogen back to the soil as a biologically available form for the cash crops to utilize. Legumes, on the other hand, work in an entirely different way to impact nitrogen. Utilizing nitrogen-fixing nodules in their root systems, legumes fix atmospheric nitrogen and exude it as biologically available nitrogen for other plants to use. With a greater level of soil nitrogen available, less added nitrogen is required for optimal crop growth.

For a long-term investment in cover crops, it can be tricky to specifically cite one benefit over the other. Sullivan spoke to the challenge of putting a line item on a spreadsheet

relating to cover crops saying, “How do you measure change in yield? Well, that is not necessarily why you cover crop. You cover crop because it makes sense.”

Management

The word of the day is management. As with anything, if you don’t manage appropriately, issues will arise. In the case of avocado groves, some of these problems can come in the form of irrigation entanglement from greedy cover crops, fat gophers snacking on your greens, thirsty cover crops sucking your water supplies, or providing a nice place for weeds you don’t like to grow. These are all considerations and managing cover crops efficiently plays into how prevalent these problems are. As with any system, it is all about trial and error and using a curious mind to manage well.

An interesting management topic is timing of seeding. Some orchards are located in frost-prone areas. Planting tall cover crops that come to maturity during the coldest days of the year can put the orchard at greater risk for frost. Carl Stucky minimized this risk by seeding low stature cover crops in January. The winter rains assist in keeping growth minimal

during those frost-prone days of February. Come March and April, a fully established cover crop provides erosion control and increased infiltration to keep rain onsite. Voila! Management problem solved.

Take Home Message

Cover cropping is a fine balance of art and science. There are guides, resources and research to inform decision making about what to cover crop and when, but there is no hard and fast answer. The success lies in choosing the right cover crops to address specific issues and managing them as they work within a unique system. Cover crops are successful when the grower is interested in feedback, experimentation and learning. This could mean manipulating seeding dates based on weather, terminating cover crops based on tree needs, or getting creative with seed mixtures that fit the orchard. At the end of the day, it is all about finding creative practices to improve the overall functioning of the orchard and being adaptable to the future ahead.

Interested in learning more about cover crops or other soil health practices? California's Climate Smart Agriculture Programs support practices that increase soil carbon sequestration, reduce greenhouse gas emissions, improve yields and efficiencies, and promote climate resilience. Nine specialists throughout the state provide technical assistance and information on how to implement best climate smart practices. Find and locate a UC Cooperative Extension climate smart agriculture specialist near you by visiting <http://ciwr.ucanr.edu/Programs/ClimateSmartAg/>. 🍌

(Alli Rowe is a community education specialist for the Climate Smart Agriculture Program of UC Cooperative Extension in Ventura County.)



Subterranean clover

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