



**Statement of the
California Farm Bureau Federation**

**TO THE
UNITED STATES HOUSE OF REPRESENTATIVES
COMMITTEE ON AGRICULTURE
SUBCOMMITTEE ON CONSERVATION AND FORESTRY**

**FOR A HEARING ON
REALIZING THE CONSERVATION BENEFITS
OF PRECISION AGRICULTURE**

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**Presented By:
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INTRODUCTION

Chairwoman Spanberger, Ranking Member LaMalfa, and Members of the Subcommittee, thank you for the opportunity to appear before you today on the important topic of realizing the conservation benefits of precision agriculture. I am Don Cameron, Vice President and General Manager of Terranova Ranch located in Helm, California. I am also the owner of Prado Farms located in Fresno County, California.

In addition to farming, I currently serve as the President of the California State Board of Food and Agriculture and as an appointed member to the California Department of Food and Agriculture's Environmental Farming Act Science Advisory Panel. I also serve on the Board of Directors for the McMullin Area Groundwater Sustainability Agency and the Raisin City Water District.

I am testifying before this Subcommittee on behalf of California Farm Bureau Federation. Farm Bureau is a non-profit, voluntary membership organization whose purpose is to protect and promote agricultural interests throughout the state of California. Farm Bureau is California's largest farm organization, representing nearly 36,000 members across 53 counties, contributing to the largest agricultural economy of any state in the nation. Farm Bureau strives to protect and improve the ability of farmers and ranchers engaged in production agriculture to provide a reliable supply of food and fiber through responsible stewardship of California's resources.

ABOUT OUR OPERATION

The Terranova Ranch was established in Helm, California in the early 1980's. At that time, the prominent crops grown were upland cotton, alfalfa hay, wheat, and barley. The first vineyards were planted in 1981 and in the late 1980's and 1990's the variety of crops grown increased to include corn silage, sugar beets and pima cotton. In 1991, we began growing processing tomatoes with a little over 5,000 tons produced. At that time, our tomatoes were grown by planting seed and practicing furrow irrigation where trenches, or furrows, are dug between crop rows in a field. Today, we use transplants and subsurface drip irrigation for the 140,000 tons of tomatoes we grow each year.

I will also add that in 1993, we began farming organically with 15 acres. Presently we have over 600 acres in organic production. In 2000, we began further increasing our variety of crops grown to our present number of over 25 different crops on 6,000 acres.

In 2018, Terranova Ranch, Inc. was recognized with the state of California's highest environmental honor, the Governor's Environmental and Economic Leadership Award (GEELA), for its efforts in pioneering and expanding the practice of on-farm groundwater

recharge – intentionally flooding fields with captured floodwater to replenish depleted aquifers. Established in 1993, GEELA is awarded to individuals, organizations and businesses that have demonstrated exceptional leadership and made notable, voluntary contributions to conserving California’s natural resources, protecting and enhancing our environment, building public-private partnerships, and strengthening the state’s economy.

In 2016, Terranova conducted a study where we calculated the calories produced by our operation. Our study concluded that Terranova Ranch is able to feed 200,000 people a 2,000-calorie diet for a year just with what our operation produces. I am very proud of the safe food supply and nutrition our farm produces.

PRACTICES IMPLEMENTED ON OUR OPERATION

At Terranova Ranch, we have concentrated our attention on methods that keep our soil, water, and air quality as sustainable and healthy as possible. More specifically, we have focused on methods and techniques on water recharge, irrigation efficiency, energy conservation, energy production, and farm equipment with cleaner emissions. Our end-goal is to maintain our operation’s long-term viability with adequate water, clean air and healthy soil.

As a diversified farming operation, our techniques make certain that our soil never gets fatigued. This means that we plant a variety of different crops on our ranch that are designed to work together. We grow crops year round by replanting fields with crops that thrive in the coming seasons. This also helps stop soil erosion while keeping the ground fertile. Another advantage of diversified farming is that no single crop makes up more than a third of our income. This helps insulate our operation from poor production years, crop price reductions and disasters.

The multitude of sustainable development principles, practices and technologies we implement on the ranch preserves our soil and allows it to be fertile, maintaining both plants and wildlife. These practices also encourage our biological systems to be productive, beneficial and diverse. Our practices include the following:

- **Water Recharge**

For over 25 years we have been working toward recharging the underground aquifer below the ranch, our main source of irrigation water. In 2011, floodwater was applied to farm fields and documented by researchers at Bachand & Associates and UC Davis. In 2012, the Kings River Conservation District (KRCD) was granted \$5 million from the California Department of Water Resources along with \$2 million in matching funds from Terranova Ranch to build infrastructure in order to capture and

distribute floodwater to Terranova and nearby farmland for on-farm recharge. Sustainable Conservation and UC Davis have been partners in this project. Work is progressing to implement this project which, at full capacity, will be able to recharge up to 1,000 acre-feet of floodwater per day on 18,000 acres of farmland. This project will be a perfect fit with the sustainable groundwater management plan for our area and we believe it showcases our commitment to long-term sustainability goals for farming in the San Joaquin Valley.

- **Drip Irrigation**

In 2009, Terranova Ranch began irrigating with subsurface irrigation on most of its annual crops. By making this change, Terranova was able to reduce water usage by 30% while increasing yields by 25%.

- **Energy**

Terranova Ranch started with a 1-megawatt solar facility on ten acres of land. By 2016, the ranch brought an additional 1-megawatt facility online. With the completion of these solar projects, renewable energy provides one third of our electric needs while reducing greenhouse gas emissions by 3,700 tons CO² per year.

We have also upgraded our sprinkler irrigation systems from impact sprinkler heads to new water and energy saving plastic sprinkler heads. The new sprinklers use less water by having better uniformity and are more efficient. We are able to conserve water and lower our energy usage, conserving resources and the environment.

We have also achieved greater sustainability through our pump motors. The use of Variable Frequency Drives (VFD's) reduces the amount of energy needed for the pumping of water. All pumps equipped with VFD's require only the amount of energy needed for the water volume desired. This is a much-needed improvement from the old practice of running a pump at full power even when unnecessary. In addition to these changes, we have also converted from diesel to electric booster pumps at all wells with VFD's.

- **Ecosystem Services**

The California Department of Food and Agriculture's (CDFA) Science Advisory Panel defines ecosystem services in agriculture as *"the multiple benefits we gain from farming and ranching including crop and livestock production. In addition to valuable open space and wildlife habitat, the management decisions and conservation practices of farmers and ranchers also enhance environmental quality, provide recreational opportunities, and offer social benefits."*

We support goals and methods of farming aimed at maintaining a diverse habitat on the farm. Wildlife helps our farm by providing necessary pest control and

contributes to the diversity of our environment. We have partnered with the National Audubon Society to promote habitat for wildlife by placing owl boxes throughout our fields. We also maintain four acres of wildlife refuge that is a home to egret and cormorant rookeries, pond turtles, frogs, ducks, great blue herons, hawks, short eared owls and other wildlife.

We have also planted about 1 acre of milkweed on the farm to support monarch butterflies that migrate through our area. In addition, we are beginning a project to establish hedgerows of native pollinator habitat on approximately two miles of levee on the farm.

- **Air Quality**

We continue to strive to make many improvements to help keep our air clean and reduce pollution. These improvements include the conversion from natural gas motors to cleaner electric motors. We are also enrolled in the San Joaquin Valley Air Pollution Control District Incentives Program which has helped us replace older Tier 1 and Tier 2 diesel engines on our tractors with cleaner, more efficient Tier 4 engines. Today, almost all of our equipment on the farm has been converted over to cleaner Tier 4 diesel engines. We have also switched 13 All-Terrain Vehicles from gasoline power to electric.

CONSIDERATIONS FOR THE SUBCOMMITTEE

I was asked by the Subcommittee to focus my comments on precision agriculture as it relates to agricultural irrigation and water certainty. I wish to raise several items I feel are important for the Subcommittee to be aware of as you consider federal policy relative to conservation and precision agriculture.

- Precision agriculture provides optimal benefits when executed at scales that recognize the limitations and capabilities of tools to effectively manage a full array of connected variables including, but not limited to, topography, biological demands, agronomics, and natural environment conditions. Therefore, it is essential that farms have the opportunity and flexibility to try new ways of farming that might improve conservation.

For example, on our farm, we have had success simply trying out new approaches in order to conserve water, improve air quality, and reduce energy consumption. We research a new opportunity, trial a new practice for a determined amount of time, test things on small plots in a controlled manner in order to measure the results. If proven successful, we are able to ramp up production on a larger test plot and ultimately adopt the practice across the farm. While we have had great success in

some areas, we have not had success in all areas. The adoption process can also be extremely costly and time consuming. Additionally, practices that work for our operation do not necessarily work for a neighboring operation or another farming region.

- California’s farmers and ranchers are at the ready to adopt new technology and precision agricultural practices, but it is critical that these technologies and practices are readily available, scientifically trialed and affordable for the operation and crops being grown. In the area of irrigation, the most common irrigation methods used in California are gravity (furrow or flood) irrigation, sprinkler irrigation and drip irrigation. Farmers choose their method of irrigation based on a series of factors including, but not limited to, soil type, topography, and the crop.

California agriculture has experienced a great level of adoption of pressurized irrigation systems such as surface drip irrigation or sprinklers. These pressurized irrigation systems generally apply water at a slow and accurate rate providing the farmer an immense amount of control. However, these systems are much more costly to install and operate than furrow irrigation techniques and may not be economically feasible for every crop or operation. Additionally, such technologies and systems may rely on a skill sets not readily available and additional investments in training or certifications must be made.

Regardless of irrigation method, all irrigation systems have the potential to be operated inefficiently. For that reason, a producer focusing on an irrigation management plan that is efficiently operated, rather than irrigation method, is most important.

- Scientific irrigation scheduling is an important component in California’s modern farming operations. To prevent this, farmers use a variety of tools to help them determine when to irrigate including, but not limited to, the weather, soil moisture, and the plant’s stress level. In California, farmers have the ability to utilize the California Irrigation Management Information System (CIMIS), a network of more than 145 automated stations across the state that gather weather data. Managed by the California Department of Water Resources, this system assists farmers with gauging the amount of water their crops need.
- It is essential that there is an understanding of the difference between “water conservation” and “water use efficiency”. These terms are often used interchangeably but to agricultural water users they are very different things.
 - Water conservation is generally perceived as an activity that reduces the amount of water used to do something, such as wash a load of clothes or

take a shower. High efficiency washing machines and low-flow showerheads *conserve* water that can then be used by another user or at a later time.

- Water use efficiency is when a water user does things to achieve more using the same (or less) water. For example, a farmer who changes their irrigation system so that water is more efficiently used by the crop, producing more saleable, higher quality crop on roughly the same amount of water. The *efficiency* is what is gained in crop production.
- While there are many advantages to implementing precision agriculture via efficient irrigation practices, we must also be cognizant of trade-offs and unintended consequences that can exist with resource decision-making. Water and energy are tightly linked. Installation and use of industrial pumps and motors, on-demand pressurized drip lines, tailwater recovery and recirculation of water for reuse can result in increased energy demand. Additionally, some producers could experience a time-shift on when energy demands occur. For example, soil moisture and plant stress monitoring can shift energy use to daylight/peak-time demand away from off-peak.

It is common knowledge that California continues to experience water uncertainty. Therefore, California's farmers and ranchers must be careful stewards of the water utilized to produce food and fiber. Though precision agricultural practices have assisted agricultural producers with reducing their consumptive water use, the unintended consequence has been less water returning to the system. In some areas, this has resulted in dramatic impacts to underlying groundwater supplies, which do not receive adequate recharge resulting in overdraft and subsidence.

This is highly relevant in the context of California's Sustainability Groundwater Management Act, which is expected in coming years to dramatically reduce the amount of groundwater that can be relied upon for irrigation in time of drought or reduced surface water deliveries. This will place a premium on efficient use and management of available water through means including new and existing technologies. At the same time, it will require expanded recharge and capture of excess flows in times of abundance. A complete solution, therefore, requires both improved management of both demand and supply sides of the equation.

RECOMMENDATIONS FOR THE SUBCOMMITTEE

In light of the considerations offered above, I offer the following recommendations to the Subcommittee for consideration:

- **Continued Investment in Voluntary Cost Share Programs for Producers**

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We are very appreciative of the many improvements that were made by this Committee in the conservation title of the last Farm Bill. Of the conservation title programs, the Environmental Quality Incentives Program (EQIP) is by far the most utilized program in California assisting producers in achieving greater conservation goals. We particularly thank you for including funding for air quality incentives, which has been incredibly important to farmers in California who face strict air standards. EQIP has assisted farmers in making great strides in the areas of air quality and water conservation and we believe there is more to come.

- **Continued Investment in Technical Assistance**
Financial resources for Natural Resources Conservation Service technical assistance staff at levels commensurate to the voluntary financial assistance are essential for assisting producer adoption.
- **Flexibility**
It is important to recognize that there is no one-size-fits-all approach for precision agriculture practices. In California alone, there are over 400 commodities grown. Each field, crop and operation will have different conservation and economic needs to factor in and we need to realize that, in some circumstances, the practices that have been promoted and validated in one field might not make sense for the next. We must be cautious in making value judgments and use our motivation and resources to identify the proper mix of new or alternative practices or technologies that work in each unique circumstance.
- **Limited Control**
Farmers have only so much control. California's farmers and ranchers continue to farm amidst great uncertainty when it comes to reliable water supplies. Despite recent improved water conditions, periodic drought is a fact of life in California. The severe 2012-2015 drought followed by the wet years since has illustrated what both extended drought and extreme rainfall cycles look like with inadequate water infrastructure. If longer and drier droughts coupled with powerful floods are the future of California's possible larger climate trend, it means we must do a better job of investing in water infrastructure and capturing water resources when they are available. This in itself is a way of maximizing efficient use of limited water resources across different year types.
- **Federal Investment/Innovative Finance Tools**
Water infrastructure investments should be made more attractive and affordable for non-federal interests. For that reason, Farm Bureau has been supportive of expanding federal financing mechanisms. We believe the combination of federal funding and common sense financial tools, such as the creation of the Reclamation Infrastructure Finance and Innovation Act (RIFIA) loan program, would greatly aid

western water managers with the construction, rehabilitation and improvement of surface and groundwater storage projects, conveyance, as well as water recycling and desalination projects. The Natural Resources Conservation Service Regional Conservation Partnership Program (RCPP) is also an excellent program.

- **Broadband**

A critical component to implementation of precision agricultural technologies is access to broadband. Despite our apparent proximity to Silicon Valley, there are many areas, myself included, of rural California that do not have sufficient access. Many rural areas either lack the initial infrastructure or have fallen behind in terms of speed and availability. It is critical that investments are made and unfortunately, in our experience, many providers are skewing their data, which creates inaccurate maps of dead zones.

Technology can provide many benefits and increase efficiency in agriculture—but only if its available to agricultural regions and our rural communities. We recommend that Congress work with the U.S Department of Agriculture and the Federal Communications Commission to fund programs to solve these critical rural broadband problems. Access to broadband will help ensure availability of on-demand regional, statewide, and national weather resources that are foundational for irrigation scheduling & other on-farm decision-making.

CONCLUSION

California's farmers and ranchers are water stewards, using water to grow the crops that feed and clothe us. California's 77,500 farms and ranches produce 50 percent of the nation's fruits, nuts and vegetables; twenty percent of the milk; and more than 400 different agricultural commodities. California's farmers have long been early adopters of new and innovative technologies that can help produce food and fiber more efficiently and that tradition continues today.

Farm Bureau appreciates the time and attention that this Subcommittee has given to this important topic today and I am happy to answer any questions. Thank you for the opportunity to testify.