

Integrating Sheep into Walnuts: Sierra Orchards



For Sean McNamara and Jeremy Shepherd, grazing sheep in orchards was a natural fit. McNamara, farm manager at Sierra Orchards in Winters, California, manages the farm's 370 acres of organic walnuts. In partnership with his childhood friend and livestock manager Shepherd, they graze sheep in Sierra Orchards' walnuts to provide a myriad of soil health benefits and move the farm towards a closed-loop system. By grazing the orchard's cover crops, Sierra Orchards has effectively reduced labor needed to manage the cover crops while realizing substantial yields. Additionally, they've seen a host of benefits: nutrient management and improvements in soil health, weed suppression, forage provision, and even pest management in the form of mummy nut reduction.

BEGINNING SHEEP-ORCHARD INTEGRATION



Sean McNamara of Sierra Orchards

photo: Anne Hamersky

When Sean became actively involved in the family's farm in 2014, started by his parents Craig and Julie in 1980, he recognized the potential to improve the orchard soil. A chord was struck when he dove into Allan Savory's work on holistic management and planned grazing, and he realized the potential to bridge livestock and orchard management. It made all the more sense to partner with Jeremy Shepherd, who also has experience in walnut production. The aptly named Shepherd, also known as "Farmer Shep", has been raising livestock for meat since 2009, and is adamant about animal welfare and proper treatment prior to slaughter.

Sierra Orchards' walnut trees range in age from 10 – 60 years old, but all blocks are managed under a no-till program that includes cover crops, compost, and grazing. The farm aims to recycle nutrients by composting all materials from the walnut huller to provide enough compost for the entire 120 acre "home ranch".

They've practiced cover cropping since the '90s, but Sean saw potential for further improvement. In 2015, Sean and Jeremy began to experiment by bringing Jeremy's sheep into the walnuts. Like

most newly introduced farm practices, there was a definite learning curve, and by working with another operation that utilized grazing, they learned what to avoid. For example, large enclosures of 10–20 acres with 200 head of sheep were difficult to manage, and they saw first hand when it was too late vs. too early to put the sheep out. This period served as a troubleshooting process, or the "experimental phase", in which they figured out the best timing for grazing in the orchards. In time, they would find a balance between optimizing grazing and minimizing compaction.



Jeremy Shepherd



MANAGING COVER CROPS AND LIVESTOCK SIMULTANEOUSLY

Today, Sierra Orchards manages its cover crops by grazing sheep in 170 acres of walnuts. What may appear to be a simple process at first glance is actually an intricate one, as cover crop management must line up with the nutritional needs and growth of the herd. In recent years, they've moved from mainly single species to mixes, planting a very diverse cover with the sheep in mind that includes clovers and Daikon. Sean would like to dial in the mix further by including a manageable grass like fescue or brome. By planting the cover crop in October, the stand has enough growth to graze as early as the end of December, provided the ground is dry enough. If the cover crop is planted on time and receives adequate rainfall or irrigation, there is often a good amount of feed by mid-January.

But before the sheep are brought out, Jeremy plans out the passes months in advance. He takes into account how much forage they can expect to see at a given time of year, and budgets for time the cover crop needs to recover between passes. There's always a need to shift to changing conditions like weather, the sheep's needs for forage, and the state of the cover crop. "It's somewhat of an intuitive process", Jeremy explains. Flexibility and reassessing the landscape throughout the seasons are integral parts of the process.

Typically, Shepherd puts the sheep on once the cover crops have grown one foot high. While the stocking density depends on the aforementioned changing conditions, he says that on a dry February day with a one-foot tall cover crop, he can expect to run 200 head of sheep per acre per day. This represents the lower end of their stocking density. Overgrazing is avoided by moving the herd once the cover crop is down to six inches. If the sheep are out during rains, he increases the fenced area to lower the stocking density and avoid compaction. Ideally, the sheep will be brought through for another pass every 30 days, which allows for regrowth and for any worms in the manure to die. All in all, the sheep are typically grazed until July 1st, and the cover crop is terminated mid-July to allow for decomposition before harvest.

Initially, Sierra Orchards relied on contract grazing. Today, they've moved to a system that incorporates contract grazing, while grazing Jeremy's herd on an additional 40 acres. In their experience, contract grazing comes with a unique set of benefits and challenges. Overall, bringing in a contract grazer has offered the convenience of not having to manage the herd, and has been fairly affordable. In many cases, less time and resources like labor and capital are required to contract graze compared to grazing with one's own livestock. On the other hand, it can be challenging to find a balance between the livestock manager's desire to minimize labor and move the herds at the optimal time. If the sheep are left on too long, compaction can become an issue, as well as the cover crop failing to reseed. For those who can balance the time, land, and labor requirements, having one's own herd for grazing can allow for a much finer tuning of crop-livestock integration, Jeremy and Sean emphasize.



photo: Anne Hamersky

FINE-TUNING THE SYSTEM

Always in search of ways to optimize, Sean and Jeremy have had a crash course in the art and science of grazing sheep to meet their production goals while playing into the natural biological cycles of the farm. There are a number of goals they continuously work toward:

- **Weed management:** Aim to reduce the weed seed bank in the long term while maintaining a reseeding cover crop in the short term. This is done through cover crop mix selection and timing of grazing
- **Predator control:** By using electric netting, Sierra Orchards has eliminated coyote predation, and no guard dogs are needed.
- **Labor savings:** Sheep eliminate hundreds of hours in weed eating and mowing, freeing up time for the crew to help manage the sheep. This includes managing fencing, repairing any sprinkler damage, etc.
- **Food safety:** Sheep that are moved daily have been tested negative for *E. coli*.

ON CROP AND SOIL HEALTH

By intentionally managing the sheep's grazing with cover cropping, the two practices can synergistically provide benefits to the soil quality and fertility. "The cover crops grow extremely well, and the trees produce good yields, with good nut size", Sean notes. Their goal is to achieve sustainable, long term yields, so investing in the soil is a priority. To provide additional organic matter, they apply compost to the tree rows that is made on-farm or sourced from the huller. The result: biologically active soil that breaks down the manure faster, and better nutrient availability than was previously seen on the farm.

LESSONS LEARNED AND BEST MANAGEMENT PRACTICES

Integrating a new practice on the farm came with a learning curve to navigate. Sean and Jeremy share lessons and observations they have picked up along the way:

1 Avoiding food safety issues:

Removing sheep at least 120 days before harvest for crops that touch the ground is recommended. Ultimately, it's up to your processor to approve this.

2 Irrigation damage:

When sheep are managed properly, irrigation damage is less prevalent. Finding the right stocking density and moving the sheep at the proper time will prevent damage.

3 Copper toxicity:

In organic systems, work with your shepherd in advance to ensure that copper applications do not impact health of the herd.

4 It's all connected:

Integrating sheep affects the farm's natural ecosystem. Birds use wool for their nests, coyotes are less abundant, and changes in small mammal populations have been observed.

LOOKING FORWARD

In the future, Sierra Orchards looks to build up their herd to manage the entirety of their walnuts and better control the timing of grazing and stocking density. They aspire to increase the herd to five hundred ewes and pasture them on hill land with semi-permanent fencing to reduce management time. But the concerns associated with a larger scale grazing operation are also at the front of mind, like the economic risk and possibility of labor shortages. In the long term, the farm strives to minimize stress levels, attain more holistic management, and minimize disease. By incorporating holistic management principles in line with their cover crop management, the combination has paid off so far.

RESOURCES

Sierra Orchards' [website](#) and [Instagram \(@Sierra_Orchards\)](#)

Jeremy Shepherd on [Instagram \(@farmershep\)](#)

CAFF's [Integrated Crop and Livestock webpage and resources](#)

[Targeted Grazing Contractors List](#) from UC Cooperative Extension

[Targeted Grazing Directory](#) from California Wool Growers Association

[Producer Directory](#) by Fibershed

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