Conservation Cover

Informational Packet

Foreword

Thank you for taking the time to consider trying conservation cover in your orchard.

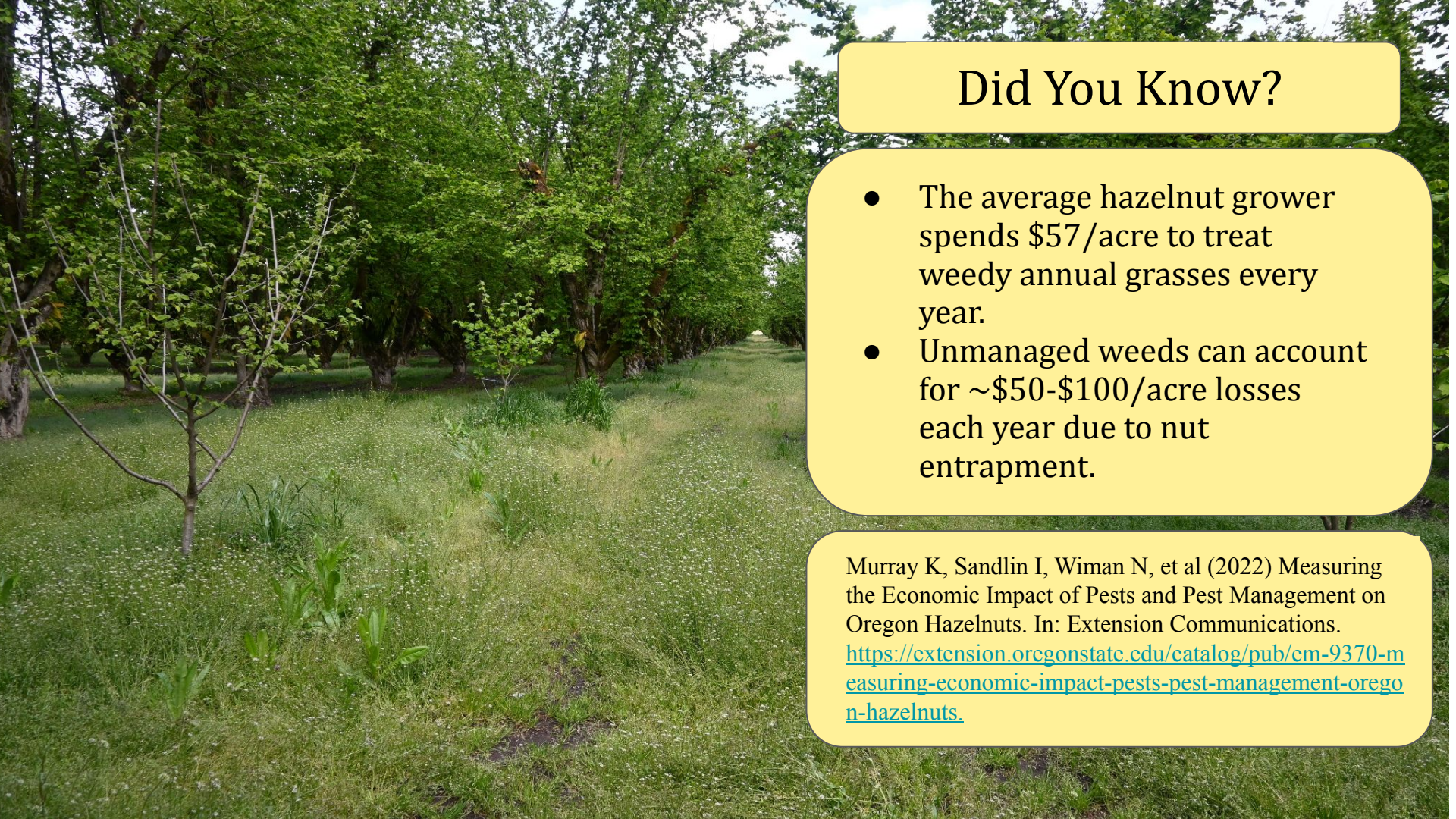
With the expansion of the Oregon hazelnut industry in the past decade, orchard health has been a target topic for growers. With conventional orchard management consisting of a bare orchard floor summer-round, cover crops have recently been suggested in practice to preserve water and soil resources. Since 2019, the Hallett Lab at the University of Oregon has been conducting cover crop trials in Willamette Valley hazelnut orchards. As a community ecology lab, we see value in conserving these resources while also being attentive to farmers' best interests. With researching this topic for the past four years, we have come to find that native cover crops, defined as "conservation cover" by the NRCS, can be an ideal cover crop for many Willamette Valley hazelnut farmers. Not only does conservation cover incorporate themes of soil and water conservation, it can also help hazelnut farmers save time and money spent on orchard floor management by reducing herbicide application, number of flail passes, and scraping year-round. Conservation cover is meant to be regenerative, with seeds only needing to be sown once, and have minimal weed control required year after year. One of the hardest parts of cover cropping in a hazelnut orchard is floor preparation to ensure that every nut can be harvested without additional effort from the grower. The native species selected for conservation cover mixes are adapted to senesce before fall, meaning orchard floors are bare in time for mechanical harvest with just a few flail mower passes. After harvest, and with the onset of the rainy season, cover regeneration takes place without any additional effort.

In this document, we hope to inform you and your farming operation of the potential benefits of conservation cover in hazelnut orchards. We provide data collected through our trial research to date (2019-2023), observations our partnering farmers have made using conservation cover, what the Hallett Lab will provide to future partnering orchards, and what our goals are as researchers. We are interested in partnering with hazelnut farming operations of all kinds, looking to gain perspective of management techniques, farmer goals, and see if conservation cover can work in the context of your farm.

Thank you,

Marissa Lane-Massee

Graduate Student & Hazelnut Farmer



Did You Know?

- The average hazelnut grower spends $57/acre to treat weedy annual grasses every year.
- Unmanaged weeds can account for ~$50-$100/acre losses each year due to nut entrapment.

Murray K, Sandlin I, Wiman N, et al (2022) Measuring the Economic Impact of Pests and Pest Management on Oregon Hazelnuts. In: Extension Communications. https://extension.oregonstate.edu/catalog/pub/em-9370-measuring-economic-impact-pests-pest-management-oregon-hazelnuts.

Benefits of Conservation Cover

Measured Target Goals:

- Weed suppression
- Cost/input reduction
- Easy harvest
- Increased pollinator diversity

Observed Benefits:

- Increased water infiltration
- Reduced winter/spring erosion
- Increased organic matter

How Conservation Cover Works

Winter

Normal winter orchard management takes place.

Spring

Watch seeds grow! Aside from orchard floor management, normal activities take place.

While managing suckers, make sure to avoid spraying open flowers. To avoid this, spray suckers before and after the flowering period.

Summer

Filbertworm management takes place. Hang up pheromone rings or flail cover down to spray. Final flail as usual.

Seed mixes are designed to be flailed down in accordance to your management practices. You will know when they are ready when the seeds are dark red/brown/black and dry.

Fall

Harvest over the dormant cover crop. Your picker will spread the cover crop seeds in whichever direction you harvest.

Sow seeds (year 1)

Cover returns (year 2)

What Conservation Cover Looks Like
(year 2+)

Dormant cover under fallen leaves in late fall

Hazelnut harvest over dormant plots

Winter cover emerging from dormancy

Flailing down cover after seed maturation in late summer

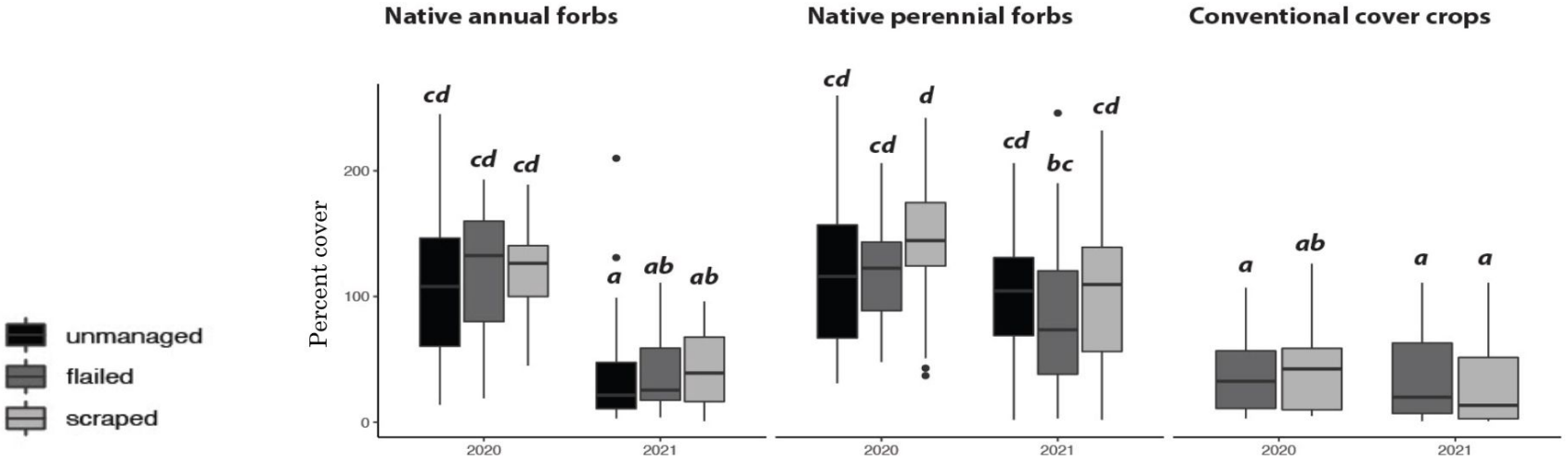
Mid-spring cover

Summer cover

Pictures from: Native Cover Trial 2022- 2023

Why Conservation Cover vs. Conventional Cover?

With native flora being adapted to the conditions of the Willamette Valley, conservation cover thrives in the understories of Oregon hazelnut orchards. These plant communities are very resilient to the pressures of flailing and scraping, especially when compared to conventional cover crops.



Native annuals and perennials maintain higher cover averages across early years of trial data when compared to conventional cover in the same years.

Figure by Dr. Alejandro Brambila, University of Oregon '22
Data from: Cover Crop Pilot 2019 - 2021
https://scholarsbank.uoregon.edu/xmlui/handle/1794/27538

Why Conservation Cover vs. Conventional Cover?

Conservation cover (here, as annual and perennial categories) suppresses spring weed cover significantly more than conventional cover across all orchard canopy cover densities. While native annuals naturally decline in year two, they still suppress more weed cover than conventional cover in year two.

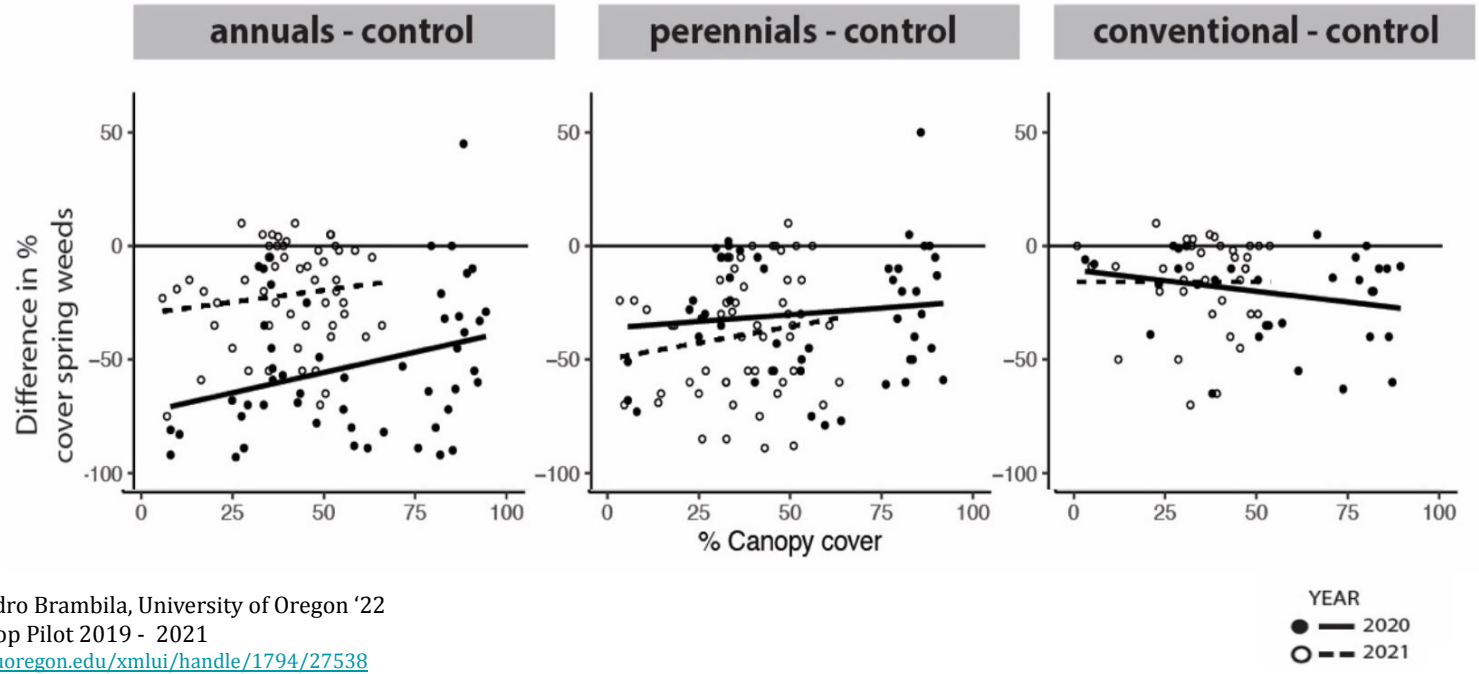


Figure by Dr. Alejandro Brambila, University of Oregon '22
Data from: Cover Crop Pilot 2019 - 2021
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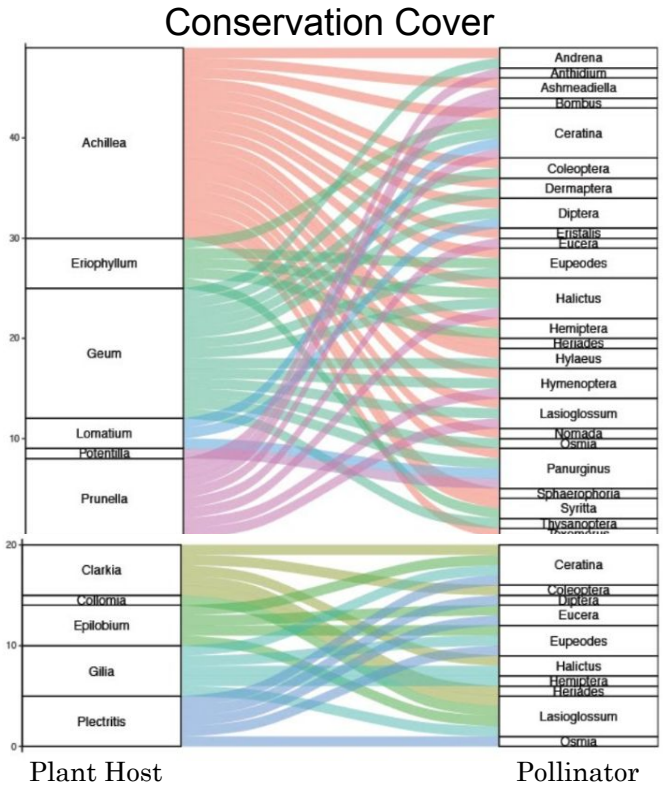
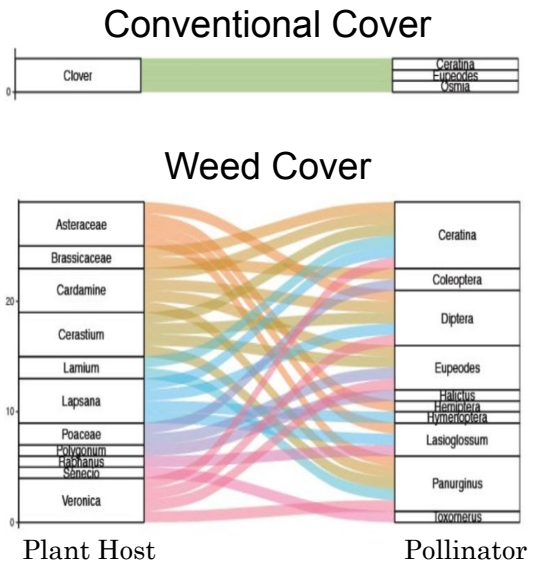
Why Conservation Cover vs. Conventional Cover?

Conservation cover significantly increases native pollinator forage compared to conventional cover and weeds.

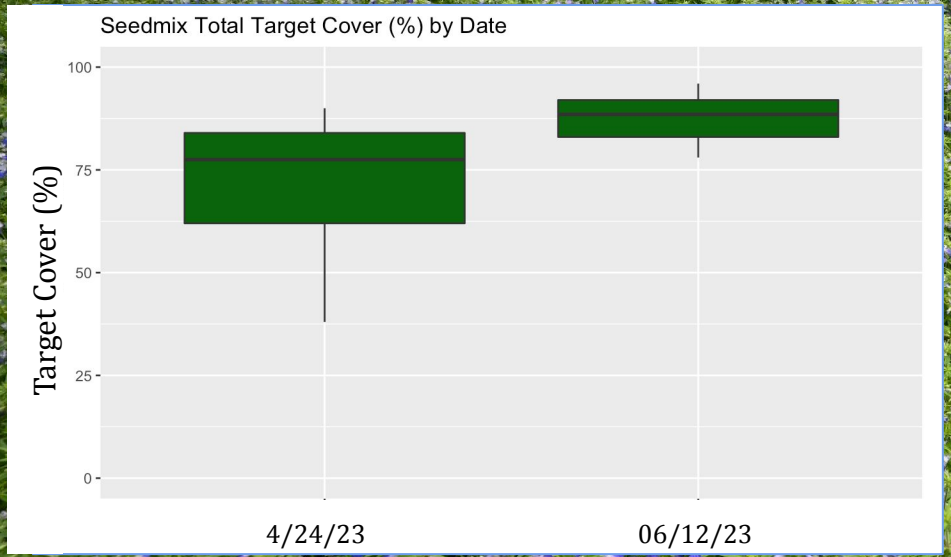


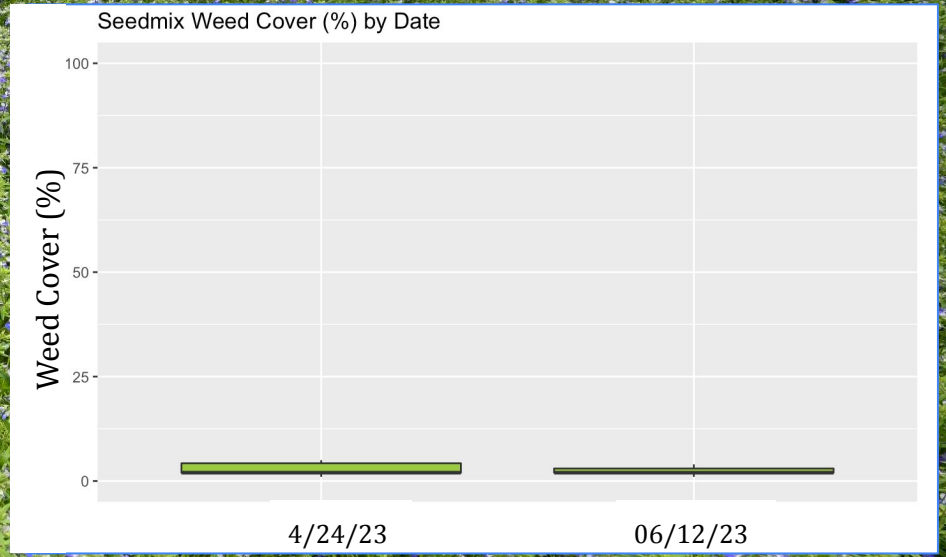


Figures by Ari Brown, University of Oregon 2022
Data from: Cover Crop Pilot 2019- 2021

Trial Data

Weed Suppression





Trial seed mixes average 87.51% target cover throughout the duration of the summer months, while maintaining an average of 4.16% weed cover, 5.03% bare ground, and 3.3% litter cover.

Figures by Marissa Lane-Massee
Data from: Native Cover Trial 2022- 2023

Trial Data - Input Reduction for Ground Management

Input	Conservation Cover	No Cover
Broadcast Herbicide Application	0 passes annually (optionally once prior to initial establishment)	1 - 3 passes annually
Flailing	2 - 3 passes annually	4 - 6 passes annually
Scraping	0 - 1 passes annually	1 - 2 passes annually

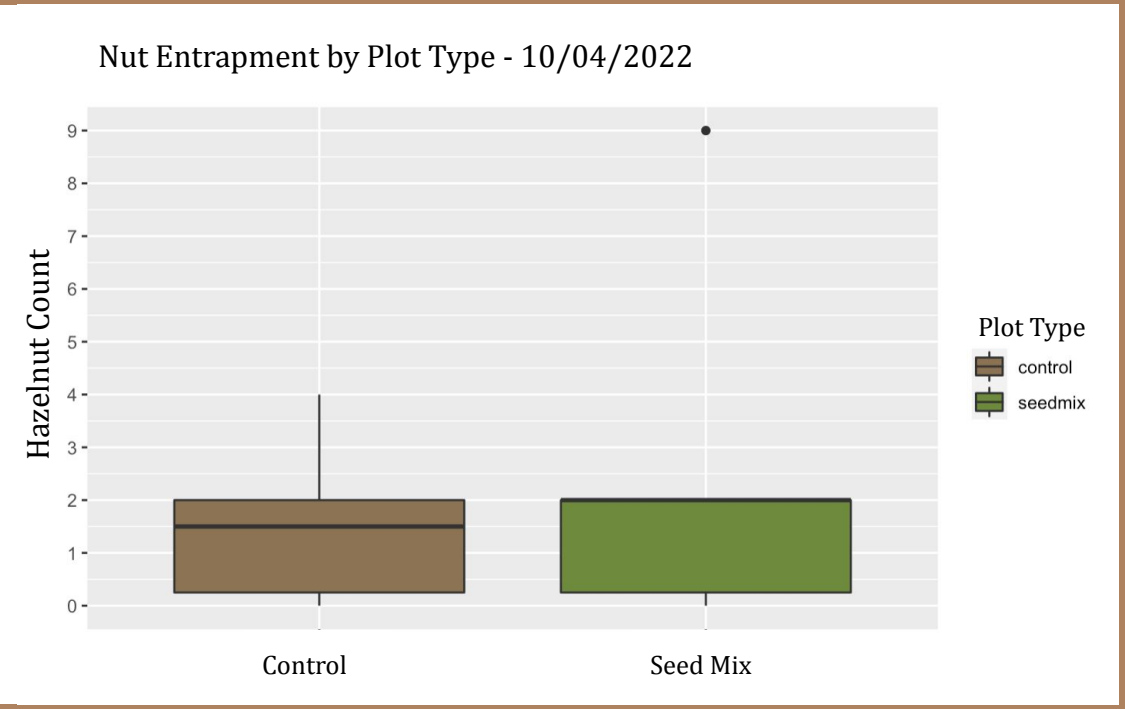
Data from: Native Cover Trial 2022- 2023

Observed Benefits of Conservation Cover

Increased organic matter breaks down easily and doesn't end up in tote bins!

Pictures from: Native Cover Trial 2022-2023

Trial Data - Harvest Nut Entrapment



Cover does not significantly increase the amount of nuts left on the ground by a standard hazelnut picker (for our trials, we use a Weiss-McNair 836)

Figures by Marissa Lane-Massee
Data from: Native Cover Trial 2022- 2023

Observed Benefits of Conservation Cover

Winter Erosion Control

Two passes with a tractor + pak tank combination (filled and empty)

Pictures from: Cover Crop Pilot 2019-2021

A Custom Seed Mix for Your Operational Goals

Conservation cover mixes can be tailored to suit the needs of your farm by selecting native plant species for your orchard age, your desired cover crop height, and the management practices you use on your farm.

Orchard Age / Canopy Cover

Cover Height

Management Practices

Pictures from: Native Cover Trial 2022-2023

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