Sheet Mulching Using Cardboard & Nitrogen Fixing Trees (NFTs)

by

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This project was funded by Western SARE Farmer/Rancher Grant ‘Sheet Mulch Using Cardboard and NFTs’ – Grant Number FW19-348.

SARE GRANT PROJECT

- Grant topic was inspired through experiences on the farm with family, working for the college, and eventually independently farming.
- Weed management – most problematic
  - Labor intensive
  - Costly to hire (including hired hands not invested)
  - Competition for water & nutrients
- Long term soil quality – challenging for fallow periods
  - No other land to farm

Objectives:

1. Research the cost analysis and production of farmed crops with and without sheet mulch

2. Establish perimeter windbreak of Nitrogen Fixing Trees

3. Design a field layout to have row plots of beds with and without sheet mulch

4. Mulch planted rows with proper amounts of cardboard NFTs – Objective modified due to delay in NFT establishment

Establish perimeter windbreak of Nitrogen Fixing Trees

- Delay due to pandemic (UOG – Provided); Sesbania
- Wind protection and biomass for mulch amendment

Design a field layout to have row plots of beds with and without sheet mulch

- 9 rows planted
- Middle row (5) not mulched row
- 4 rows covered with grass (roadside)
- 4 rows covered with shredded paper (calamansi side)

- I primarily focused on the pepper field as yield data would be available

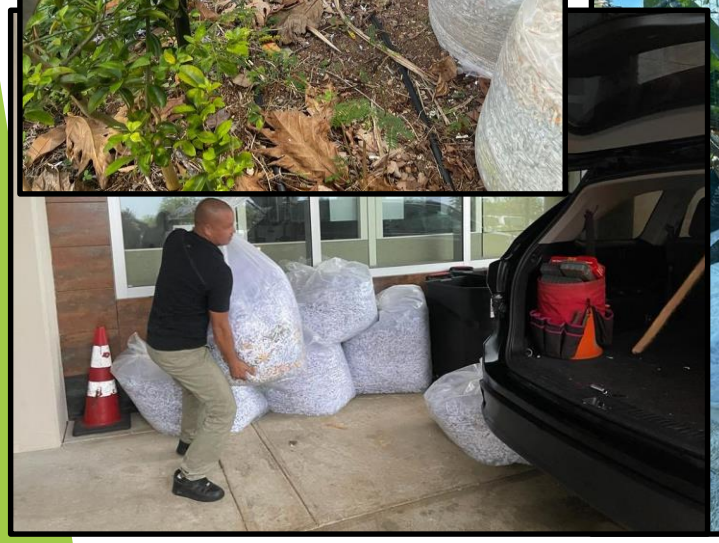
Mulch Collection & Types

Shredded Paper

- Coast 360
- UOG/Mark Acosta
- PDN

Grass

- Self Made
- School Service



Cardboard – to be collected from near by stores and schools

- Idea was to contribute to by RRR
- Weed suppression – reduce labor costs and labor intensive maintenance
- Load up carbon for long term soil build up

Day of Planting
9/11/21 – Peppers (Guåfi)

Install Cardboard and Mulch

3 weeks after planting (October 2nd)
Row 5 (requires weeding out)

1 month later – Nov 6th

- Mulched rows took 1 person 10 minutes
- Non mulched row took 1 person 2 hours

Following Day (Nov 7th)

Numbers with Regular Maintenance
3 week later – Nov 30th

Research the cost analysis and production of farmed crops with and without sheet mulch

- I'd like to express at this point that values reflected may differ with your area and other external factors. These numbers are from my field and my experiences during this time frame. Exact day to day numbers I have available.

- Initial labor input – Depending on which is most applicable to you
  - Gather cardboard from nearby stores – 2 full truck loads – 1 hour each
  - Install cardboard and shredded medium – 1 hour/row
- Mulch varied depending on shredded medium
- Shredded paper can be delivered (no time allotted)
  - Pick up can take up to an hour per trip (depends on vehicle and amount needed)
  - 80 ft row required 5 full bags of shredded medium (5 truck loads)
- Grass can be acquired through grass maintenance
  - About 4 hours of cutting grass was able to make 27 large bags

- **Approximate cost at max value – 16 total hours**
  - **@9.25/hr - $148.00 vs. $0.00**

Mechanical Weeding

- Field left to 1 month of no weeding
- 1 person - 2 hours to weed out 1 complete row (no mulch)
- If maintenance were scheduled this way, weeding maintenance = 18 hours of weeding each time
- This will have occurred 5 times-present = 90 hours of weeding
- 10 minutes to weed out 1 complete row (mulch) = 7.5 hours of weeding

- Regular maintenance will be every 2.5 weeks
- 1 person - 30 minutes to weed out 1 complete row (no mulch)
- If this method was used from the beginning this value becomes = 40.5 hours of weeding
- 1 person – 5 minutes to weed out 1 complete row (mulch) = 6.75 hours of weeding

- Approximate Costs:
  - Monthly maintenance @ $9.25/hr = $832.50 labor costs ($69.37 for mulched rows)
  - Regular maintenance @ $9.25/hr = 374.63 labor costs ($62.43 for mulched rows)

Production Values

- Data was cut short due to thieves damaging crops – Values only reflect the first 2 months of harvesting (peak was not reached)
- Design: Rows 1 and 9 were used as border plants – not used for data (still took data)
- Row 5 was the designated middle most row for non mulch
- Row 4 was randomly selected to compare data (although all rows of data were collected at each harvest)
- Each row also had 5 randomly selected plants for data taking as well
- Row 4 was significantly higher than row 5
  - Note: all rows actually had significantly higher yields
- All rows were increasing while row 5 became stagnant in production
- As yield was still increasing each harvest, thieves damaged at least 25% of crops (data taking was ceased)

Key Takeaways:

- Conservation practices proved to be practical and economical (Joe and Mark)
- Positive correlation showing between higher yields and mulched row
- Mulched rows shows to be less labor intensive and less costly over the life of the crop
- Soil health and quality will be further reported on after termination of the crop – (initial and post soil test results comparison)
  - Nutrients and organic matter %
- Irrigation: much less water needed to maintain fields (compared to typical past farm fields:
  - After the initial 3 weeks after planting irrigation supply was not turned on
  - September - December 26th irrigation from city line was not turned on (except fertigation)

- More to learn from in the future!
- Thank You all for attending and hopefully this time has been beneficial to you!