

Soil-Biodegradable Mulches: *Workshop*

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Presenter Notes

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Synopsis:

Sociology allows us to explore perceptions, experiences, and adoption of BDMs as a new technology.

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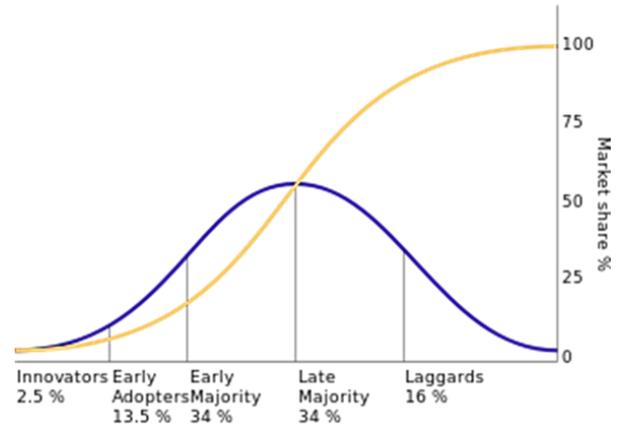
Sociology – Perceptions and Experiences with Soil-Biodegradable Mulch

This workshop series provides slide presentations on soil-biodegradable mulches (BDMs). These notes provide additional information for presenters. Numbers in the text correspond to the slides in each presentation. Information in this document was summarized from publications listed in the Reference section.

1. This presentation provides information on perceptions and experiences of growers with soil-biodegradable mulch (BDM), and associated barriers and bridges for adoption.



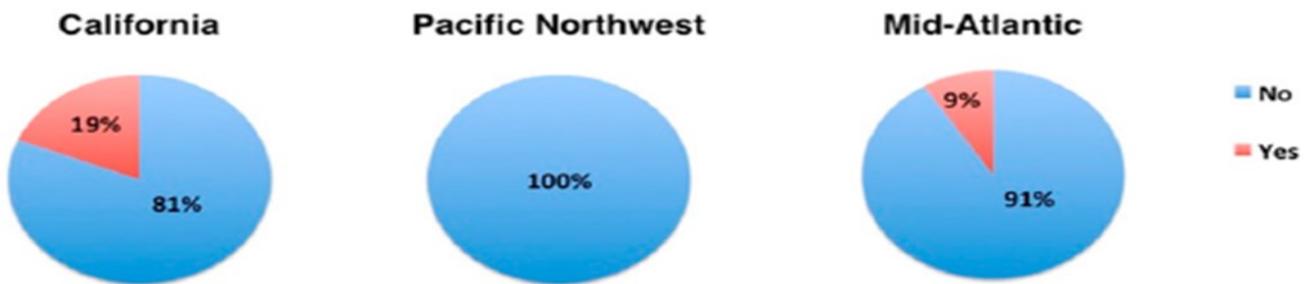
2. Sociology is the study of society, human behavior, and relationships. It allows us to explore perceptions, experiences, and adoption of new technologies or innovations. BDMs are a new technology. There are five established adopter categories: innovators, early adopters, early majority, late majority, and laggards. The majority of the population tends to fall in the middle categories. People in the 'early majority' category need to see evidence of the innovation's effectiveness while people in the 'late majority' category will only adopt an innovation after it has been tried by the majority.



3. In a survey of 227 US strawberry growers in 2016, growers' perceptions and experiences with plastic mulches were assessed. 52% of respondents agreed that BDMs are environmentally friendly. 41% of respondents agreed they are interested in using biodegradable plastic mulch films.

State	Frequency	Percentage
CA	32	14
NY	41	18
OR	30	13
PA	88	39
TN	8	4
WA	28	12
TOTAL	227	100

4. In their study, they asked growers if they have ever used BDMs in their strawberry production. Nearly one-fifth of California respondents, and 9% of Mid-Atlantic respondents had used BDMs in their strawberry fields while none of the respondents in Pacific Northwest had used BDMs in their strawberry fields.



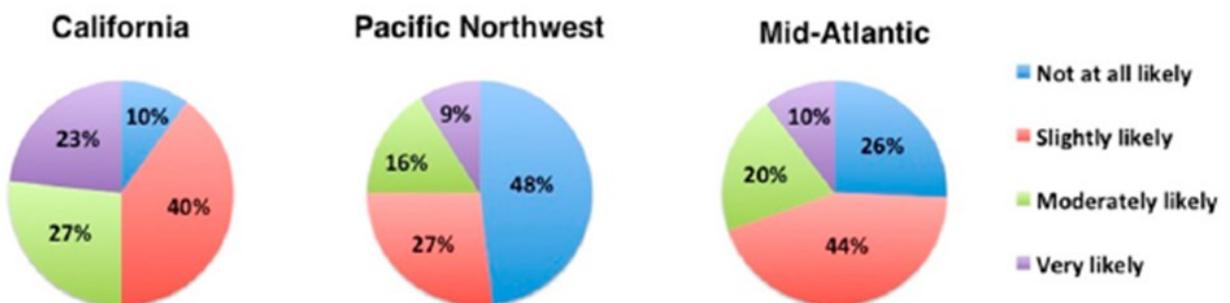
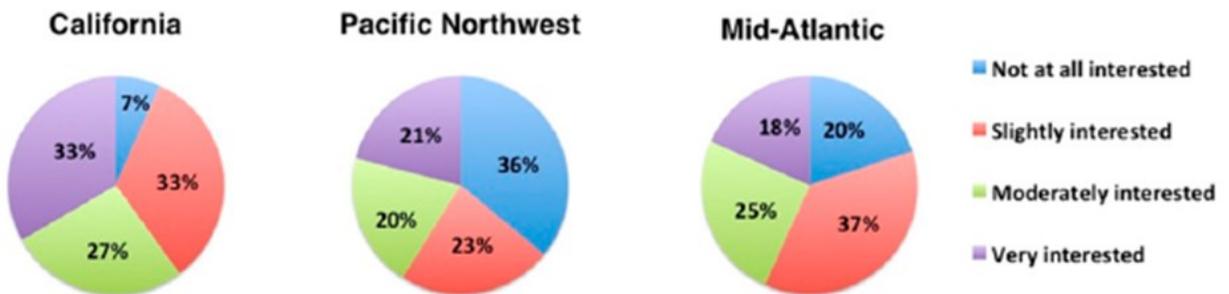
5. Respondents were asked about their opinions on BDMs in the survey. When asked what they liked most about using BDM in their strawberry fields, 33% of survey respondents mentioned the lack of need to remove/dispose of the mulch films, 20% mentioned about healthy/clean plants, 13% mentioned weed control, and 13% men-

tioned about biodegradability. When asked what they liked least, 53% of respondents mentioned that the mulch films break down too quickly, 20% mentioned that BDMs degrade unevenly within fields or season-to-season, and 20% mentioned that BDMs are expensive.

6. When asked about their interest in learning more about BDMs for US strawberry production, a majority of respondents in all three regions expressed an interest in learning more about BDMs for strawberry production. A higher percentage of respondents in the Pacific Northwest (36%) and the Mid-Atlantic (20%) expressed no interest com-

pared with California respondents (7%). Nearly half (48%) of respondents in the Pacific Northwest were not at all likely to consider using BDMs in their strawberry fields in the next 5 years, compared with smaller percentages in California (10%) and the Mid-Atlantic (26%).

Pros*	Cons
No need to remove/dispose mulch (33%)	Breaks down too quickly (53%)
Healthy/clean plants (20%)	Degrades unevenly within fields or season-to-season (20%)
Weed control (13%)	Expensive (20%)
Biodegradability (13%)	



7. In an online Qualtrics^{XM} survey of strawberry growers in six counties in California, there were 43 respondents, which constituted about 24% of the strawberry acreage of California in 2018. The respondents included owners, partners, lessees, or hired managers of the farm. The size of farms ranged from 0 to 463 hectare among respondents with an average of 81 hectare.
8. 5% of respondents used BDMs in all of their fields and 10% of respondents used in some of their fields. Among them, only one grower was satisfied with the BDM performance. 77% of respondents reported BDMs to be an unproven technology. Respondents expressed their concern regarding durability, degradation before the next crop rotation, compatibility with soil fumigation, cost and color of BDM.

9. Barriers and bridges to adoption were explored in surveys and focus groups conducted between 2009 and 2012 with growers, extension agents, agriculture input suppliers, mulch manufacturers, and other stakeholders. Barriers of adoption were found to be 1) insufficient knowledge; 2) high cost, and unpredictable breakdown of BDM. Bridges to adoption were noted to be 1) reduced waste; 2) environmental benefits; and 3) interest in additional knowledge of growers.
10. On-farm trials with watermelon, winter squash, and cut flowers achieved good crop quality and yield with BDMs. BDMs visibly degraded. Farm owner and operators, who were concerned about BDM fragments looking like non-biodegradable plastic when tilled down in the fall, were pleased with how the BDMs had broken down in the following spring. They found few scraps remaining in the soil. Plastic BDMs were preferred over PE and paper mulch, and were considered more environmentally friendly. Growers were concerned about aesthetics of plastic BDMs (which look like PE mulch), soil health over time, and fear that customers may have negative connotations to the word “plastic” even if it’s biodegradable.

Likelihood of using BDMs in the future [percentages, rounded (%)]			
Not at all	Slightly	Moderately	Very
40	35	15	10



Resources

These information resources provide background information and additional information to help you have a more thorough understanding of this topic. We encourage presenters to view each one so as to be better prepared for your presentation.

Barriers and Bridges to the Adoption of Biodegradable Plastic Mulches for US Specialty Crop Production

<https://pdfs.semanticscholar.org/a05a/6b56fdoeb8ad3d162ef1587cf3b33acf6ea1.pdf>

On-Farm Biodegradable Mulch Case Studies

Winter squash <https://ag.tennessee.edu/biodegradablemulch/Documents/CaseStudyFactsheet-Omache-9-14-18FINAL.pdf>

Watermelon <https://ag.tennessee.edu/biodegradablemulch/Documents/CaseStudyFactsheet-Cloudview-9-14-18FINAL.pdf>

Cut flowers <https://ag.tennessee.edu/biodegradablemulch/Documents/CaseStudy-Boxx%20Berry.pdf>

Polyethylene and Biodegradable Plastic Mulches for Strawberry Production in the United States: Experiences and Opinions of Growers in Three Regions

<https://doi.org/10.21273/HORTTECH04393-19>

Use of Plastic Mulch Films in US Strawberry Production

https://ag.tennessee.edu/biodegradablemulch/Documents/Strawberry_Grower_Survey_Summary_Report-February2017.pdf

What Is the Technology Adoption Working Group and Why Is It Necessary?

<https://ag.tennessee.edu/biodegradablemulch/Documents/Fact-sheet-TAWG-FINAL.pdf>

