Latest Activities and Successes of Ag Field Plastic Pollution Prevention

Jazmine Mejia-Muñoz, M.S.
Ag is the dominant industry within the Monterey Bay National Marine Sanctuary watersheds.

Exposure to sun, wind, and water leads to exportation of plastic out of the fields and into the ocean.
Plastic Travels to the Ocean

Source - Pam Krone
Our Work Going Forward

- Look for opportunities to fund my continued work on plastic solutions for agriculture.
- Participate in Biodegradable Mulch Collaboration and Field Trials. Develop ways to communicate outcomes with Growers and Ag Professionals.
- Collaborate with CSUMB and MLML on continued monitoring, fate, transport and degradation of plastic
- Seek solutions for each plastic type and find ways to communicate to the ag community.
## 2020 - Assessment of Field Plastic Use In Monterey County

<table>
<thead>
<tr>
<th>Crop Type</th>
<th>Planted Acreage 2018</th>
<th>Drip Tape (lbs/year)</th>
<th>Hoop House Plastic (lbs/year)</th>
<th>Mulch and Fumigation tarp (lb/yr)</th>
<th>Total Field Plastic (lb/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artichoke</td>
<td>5,993</td>
<td>232,941</td>
<td>0</td>
<td>0</td>
<td>232,941</td>
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<tr>
<td>Cane Berry</td>
<td>905</td>
<td>11,104</td>
<td>401,765</td>
<td>85,147</td>
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<tr>
<td>Cole</td>
<td>82,175</td>
<td>2,286,960</td>
<td>0</td>
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<td>2,286,960</td>
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<td>Field Crop</td>
<td>9,583</td>
<td>142,326</td>
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<td>Grapes</td>
<td>44,924</td>
<td>3,179,945</td>
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<td>Leafy Green</td>
<td>131,683</td>
<td>3,848,480</td>
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<td>3,848,480</td>
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<td>Misc</td>
<td>50,402</td>
<td>1,764,045</td>
<td>197,109</td>
<td>55,685</td>
<td>2,016,839</td>
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<tr>
<td>Orchard</td>
<td>1,938</td>
<td>207,995</td>
<td>0</td>
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<td>207,995</td>
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<td>Strawberry</td>
<td>9,839</td>
<td>517,876</td>
<td>0</td>
<td>7,801,007</td>
<td>8,318,882</td>
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<td>TOTAL</td>
<td></td>
<td>12,191,672</td>
<td>598,874</td>
<td>7,941,839</td>
<td>20,732,384</td>
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</tbody>
</table>

Source - Krone 2020
Benefits of Plastic Use in Agriculture

- More efficient resource utilization
- Weed suppression and lower pesticide use
- Longer crop season
- Control animal entry to field-food safety
- Packaging/ transport
- Increased yields
- Grow crops in arid areas/ expand area of crop production

Source - Rivulis
Drip Irrigation in Monterey County

• Minimize water use and are used consistently on many row crops in
• Drip Irrigation Tape (DIT) is the most abundant plastic type (by weight) used in crop production
  • ~ over 12 million pounds/year
• About 60% of the types of ag plastics assessed

Source: Pam Krone
Drip Tape Use in Monterey County

• Drip Irrigation Tape (DIT) use in Monterey County has increased by 250%, from 2005 to 2019.

• DIT is mostly recyclable, but recycling services are not easily accessible to all growers

Source: Jazmine Mejia-Munoz
Solution Oriented Approach

- Involve key stakeholders to strategize and implement solutions to improve the recycling rate of DIT and reduce its leakage out

- 2021 - Hybrid Stakeholder meeting at the Monterey Farm Bureau
DIT Pilot Program at MRWMD

• The California Integrated Waste Management Act (AB 939), requires that centers divert 50% or more of the waste

• Collaboration with Monterey Regional Waste Management District and Recyclers – growers can drop off separated Drip Tape

Source: Jazmine Mejia-Muñoz
Achievements

• Report: Identifying and Communicating Ways to Increase the Recycling of Drip Irrigation Used in Agriculture in Monterey County

• Outreach Events and Material – Ag Plastic Conference San Diego, Eco Farm, Ag Expo, ALBA, Upcoming National NRCS meeting (April 19)

Source: Jazmine Mejia-Muñoz
100% of Separated Drip Tape arriving to MRWMD is now being Recycled!
Polyethylene Mulch

• 7.9 millions pounds of plastic mulch are used per year in Monterey County

• Benefits – weed control, moisture retention, soil temp modification, etc

• Existing local Solution: Completely remove the mulch plastic from the fields including all the small fragments and take to landfill

Source: Jazmine Mejia-Muñoz
Soil- Biodegradable Mulch (BDM)

• Alternative to PE Mulch, tilled in to the soil at the end of the season.

• Eliminates plastic waste and Disposal Challenges

• Ocean Trials – How does BDM behave in marine systems?

Source: Jazmine Mejia-Muñoz
BDM Trials

- In 2021 - we had five BDM trials of biodegradable mulch in strawberry production on the Central Coast
- PSE Monitoring, Interviews, and Post Tillage monitoring
- Challenge – Need a faster Decomposition Rate

Source: Jazmine Mejia-Muñoz
Best Practices!

1. At the end of the season separate, clean, and bundle plastics used in agriculture fields
2. Collect stray pieces of plastic that are left behind
3. Recycle your plastic whenever possible
4. Purchase agricultural products made with recycled content or use alternative products

Source: Jazmine Mejia-Muñoz
Moving Forward

- Chemical Recycling - Pilot Program for recycling Mulch in Monterey County
- Expand BDM trials to include other colors, counties, crops, substrates to increase degradation, and ocean trials.
- Seek Funding for additional funding to support Ag Work
  - NOAA’S Marine Debris Prevention Grant, SCRI Grant
- Look at end of life solutions for other ag field plastics.
- Establish long term monitoring of Ag Plastic - Collaborate with beach clean up/ marine debris prevention groups to better understand the escape of Ag Plastics.
Stay Connected!

• Agriculture Water Quality Alliance- www.awqa.org/
• You Tube Channel – California Marine Sanctuary Foundation
• Social Media as CA Marine Sanctuary Foundation
  o Instagram
  o TikTok
  o Facebook
Thank you Ag Community Stakeholders!

<table>
<thead>
<tr>
<th>Allan Company</th>
<th>American Recycling</th>
<th>ALBA</th>
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<tbody>
<tr>
<td>Bedford Enterprises</td>
<td>Boutonnet Farms:</td>
<td>Andros Engineering</td>
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<tr>
<td>Cal Giant</td>
<td>California Strawberry Commission</td>
<td>Braga Fresh</td>
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<td>CMSF</td>
<td>D'Arrigo</td>
<td>CMP</td>
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<td>Gonzales Irrigation</td>
<td>Driscoll’s</td>
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<td>Flipping Iron</td>
<td>Huntington Farms / Natures Reward</td>
<td>Farmhouse Communication</td>
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<td>Miguel Ramos</td>
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<td>Measure to Improve</td>
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<td>MPWMD</td>
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<td>Rebecca Bozarth</td>
<td>Open Farm Tours</td>
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<td>Rivulis</td>
<td>RCD- San Mateo</td>
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<td>Salinas Tarp Pullers</td>
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<td>Taylor Farms</td>
<td>USDA</td>
<td>SWIX</td>
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<td>UCCE</td>
<td>Monterey National Marine Marine Sanctuary</td>
<td>Toro</td>
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<td>Yolo County- Waste Reduction</td>
<td>Washington State University</td>
<td>Others that I might have missed!</td>
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</table>
Thank You!

Pam Krone
Bridget Hoover
Robert Mazurek
Danielle Brown
Karen Grimmer
Dawn Hayes
Lisa Wooninck

MONTEREY BAY NATIONAL MARINE SANCTUARY

The Nature Conservancy

CMSF CALIFORNIA MARINE SANCTUARY FOUNDATION
Questions?

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References


