

# 2025 Precision Application Survey

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Start of Block: Introduction

## T1 Survey on the Use of Targeted Pesticide Application Equipment

Greetings! Thank you for your support in this survey on the **use of targeted pesticide application equipment**. The questions in this survey are focused on growers' use of targeted spray technologies for chemical pesticides (for example, See&Spray™, Greeneye™, SmartSpray™ and others).

The survey is not focused on non-chemical pest management technologies such as laser, thermal, and electric weeders or bug vacuums. The survey will take approximately **15 minutes** to complete.

**This survey is confidential and your identity will not be linked to your responses.** We value your time and input. **Please click on the right arrow below to begin the survey.**

**About OPMP:** USDA's Office of Pest Management Policy (OPMP) was created to support U.S. growers and to help maintain grower access to effective, affordable, and environmentally sound pest management tools. OPMP collects and provides accurate pest management information to Federal regulatory agencies, including the Environmental Protection Agency (EPA), to help ensure that pesticide risk assessments and mitigation/labeling decisions are based on an accurate, timely, and realistic understanding of agricultural practices in the United States.

For more information about OPMP's mission and ways OPMP supports U.S. growers, please visit our website at: <https://www.usda.gov/oce/pest/about>. For questions, you can contact OPMP at: [sm.opmp.pesticides@usda.gov](mailto:sm.opmp.pesticides@usda.gov).

Paperwork Reduction Act Statement: According to the Paperwork Reduction Act of 1995, an agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is **0503-0026**. The time required to complete this information collection is estimated to average 15 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

End of Block: Introduction

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Start of Block: Demographic (General)

**D1** How did you receive this survey link? Select all that apply.

☐

Certified Crop Advisors (CCAs)

☐

National Alliance of Independent Crop Consultants (NAICC)

☐

National Association of County Agricultural Agents (NACAA)

☐

Other (please specify) \_\_\_\_\_

**D2** Which of the following categories describe your **specialization in agricultural production**?  
Select all that apply.

☐

I work for an academic institution (e.g., professor, researcher, Extension agent).

☐

I am a Certified Crop Advisor (CCA).

☐

I am a member of the National Alliance of Independent Crop Consultants (NAICC).

☐

I am currently an agricultural producer.

☐

I was previously an agricultural producer.

☐

Other agricultural involvement (please specify) \_\_\_\_\_

☐

None of the above

*Display this question:*

*If Specialization = None of the above*

T3 Based on your response, it appears you are **not part of the agricultural community we are trying to survey**. We are looking for respondents who are involved in outdoor agricultural production. If you are involved with outdoor agricultural production and selected "**None of the above**" in error, please press the back button and select a different response to continue the survey. Otherwise, we thank you for your time and your response has been recorded.

*Skip To: End of Survey If Off ramp (specialization) Displayed*

**End of Block: Demographic (General)**

**Start of Block: Branching (Row or Orchard)**



**B1.all** Which type of crops do you most commonly work with? Only one response is allowed. If you work with both types of crops, please select the category that you have the most experience with.  
Note: If you select Row crops, you will answer questions about targeted boom/ground sprayers. If you select Orchard/Vineyard crops, you will answer questions about targeted airblast sprayers.

- ☐ Row crops (e.g., corn, soybean, wheat, potatoes, vegetables, etc.)
- ☐ Orchard/Vineyard crops (e.g., tree fruit, tree nuts, vineyards, hops, etc.)

End of Block: Branching (Row or Orchard)

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Start of Block: Demographic (Row)



**D3.row** In the past five years, which of the following **row crops** have you worked with, either as a producer or in an advisory capacity?

Select up to five crops you work with most frequently.

☐

Corn

☐

Soybean

☐

Wheat

☐

Cotton

☐

Sorghum

☐

Rice

☐

Canola

☐

Dry beans

☐

Barley

☐

Oats

☐

Peanuts

☐

Sugarbeets

☐

Vegetables (fresh market)

☐

Vegetables (processing)

☐

Potatoes

☐

Pasture/Rangeland

☐

Alfalfa/Forage/Hay

☐

Fallow Agricultural Land

☐

Other (please specify) \_\_\_\_\_

☐

☒ I was not involved in the production of any of these crops

*Display this question:*

*If Crops = I was not involved in the production of any of these crops*

**T4.row** Based on your response, **it appears you are not part of the agricultural community we are trying to survey**. We are looking for respondents who are involved in agricultural production, either as a producer or advisor.

If you are involved in agricultural production, **please press the back button** and select one or more crops to continue the questionnaire. Otherwise, we thank you for your time and your response has been recorded.

*Skip To: End of Survey If Off ramp (none) Displayed*

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*Carry Forward Selected Choices - Entered Text from "In the past five years, which of the following row crops have you worked with, either as a producer or in an advisory capacity? Select up to five crops you work with most frequently."*



**D4.row** For approximately **how many years** have you been involved with the crops selected in the previous question, as a producer or advisor?

*You must answer for each crop you selected to progress to the next question.*

	Less than 2 years	2 to 9 years	10+ years
Corn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Soybean	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Wheat	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cotton	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Sorghum	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Canola	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page Break

*Carry Forward Selected Choices from "In the past five years, which of the following row crops have you worked with, either as a producer or in an advisory capacity? Select up to five crops you work with most frequently."*



**D5.row** Approximately **how many acres** of the selected crops do you produce and/or advise on?

Please provide a response for each crop you selected. Estimates are acceptable.

- ☐ Corn \_\_\_\_\_
- ☐ Soybean \_\_\_\_\_
- ☐ Wheat \_\_\_\_\_
- ☐ Cotton \_\_\_\_\_

Carry Forward Selected Choices from "In the past five years, which of the following row crops have you worked with, either as a producer or in an advisory capacity? Select up to five crops you work with most frequently."



**D6.row** Approximately **how many operations** of the selected crops do you produce and/or advise on?

Please provide a response for each crop you selected. Estimates are acceptable.

- ☐ Corn \_\_\_\_\_
- ☐ Soybean \_\_\_\_\_
- ☐ Wheat \_\_\_\_\_
- ☐ Cotton \_\_\_\_\_

Page Break \_\_\_\_\_

**D7.row** In the past five years, in **which state(s)** were you involved with production of the crops you selected? Select all that apply.

- ☐ Alabama
- ☐ Alaska
- ☐ Arizona
- ☐ Arkansas
- ☐ California
- ☐ Colorado
- ☐ Connecticut
- [Other states listed here]
- ☐ Other (please specify) \_\_\_\_\_

End of Block: Demographic (Row)

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Start of Block: Knowledge PA Tools (Row)

**T5.row** Next, we will ask about the **use of targeted pesticide application equipment** in the crops you work with.

**Targeted pesticide application** (also called **precision application**) refers to the use of pesticide sprayers equipped with cameras or sensors that detect weeds or crop canopy to direct spray only to where it is needed.

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**Q1.row** Please indicate your level of familiarity with the following types of **targeted pesticide application equipment**. Some brand names are listed below but may not include all relevant examples.

**Targeted boom/ground sprayers:** Examples include See & Spray™, Greeneye™, Weed-It™, One Smart Spray™, ARA Sprayer™

**Drone scouting and prescription weed map:** Example is SmartScript™

	Not familiar with this technology	Familiar with this technology, but not used on farms I work with	This technology is used on farms I work with.
Targeted boom/ground sprayers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drone scouting and prescription weed map	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page Break

Display this question:

*If Knowledge of PA tools = Other (please specify) [ Not familiar with this technology ]*

*And Knowledge of PA tools = Targeted boom/ground sprayers [ Not familiar with this technology ]*

*And Knowledge of PA tools = Drone scouting and prescription weed map [Not familiar with this technology ]*

**T6.row** Based on your responses, it appears you are not familiar with targeted pesticide application equipment.

Thank you for your time. Your response has been recorded.

*Skip To: End of Survey If Off ramp (Have not heard of PA) Displayed*

Display this question:

If Knowledge of PA tools = Targeted boom/ground sprayers [ This technology is used on farms I work with. ]

Or Knowledge of PA tools = Drone scouting and prescription weed map [ This technology is used on farms I work with. ]

Or Knowledge of PA tools = Other (please specify) [ This technology is used on farms I work with. ]

**Q2.row** Do farms you work with use targeted pesticide application through **custom applicators** or do they use their **own precision sprayers**?

	Custom applicators	Own precision sprayers	Both (Custom applicators and own sprayers)
<div>Display this choice:</div> <div>If Knowledge of PA tools = Targeted boom/ground sprayers [ This technology is used on farms I work with. ]</div> <div>Targeted boom/ground sprayers</div>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<div>Display this choice:</div> <div>If Knowledge of PA tools = Drone scouting and prescription weed map [ This technology is used on farms I work with. ]</div> <div>Drone scouting and prescription weed maps</div>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<div>Display this choice:</div> <div>If Knowledge of PA tools = Other (please specify) [ This technology is used on farms I work with. ]</div> <div>Other (please specify)</div>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

End of Block: Knowledge PA Tools (Row)

Start of Block: Demographic (Orchard)



**D3.orch** In the past five years, which of the following **orchard/vineyard crops** have you been involved in, either as a producer or in an advisory capacity? Select all that apply.

- ☐ Tree Fruit Orchards (non-citrus)
- ☐ Citrus Groves
- ☐ Tree Nut Orchards
- ☐ Vineyards
- ☐ Other (please specify) \_\_\_\_\_
- ☒ I was not involved in the production of any of these crops

Page Break

*Display this question:*

*If Crops = I was not involved in the production of any of these crops*

**T4.orch** Based on your response, **it appears you are not part of the agricultural community we are trying to survey**. We are looking for respondents who are involved in agricultural production, either as a producer or advisor.

If you are involved in agricultural production, **please press the back button** and select one or more crops to continue the questionnaire. Otherwise, we thank you for your time and your response has been recorded.

*Skip To: End of Survey If Off ramp (none) Displayed*

Page Break

Carry Forward Selected Choices - Entered Text from "In the past five years, which of the following orchard/vineyard crops have you been involved in, either as a producer or in an advisory capacity? Select all that apply."



**D4.orch** For approximately **how many years** have you been involved with the crops selected in the previous question, as a producer or advisor?

*You must answer for each selected use site to progress to the next question.*

	Less than 2 years	2 to 9 years	10+ years
Tree Fruit Orchards (non-citrus)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Citrus Groves	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tree Nut Orchards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Vineyards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Page Break

Carry Forward Selected Choices - Entered Text from "In the past five years, which of the following orchard/vineyard crops have you been involved in, either as a producer or in an advisory capacity? Select all that apply."



**D5.orch** Approximately how many acres of the selected crops do you produce and/or advise on?

*Please provide a response for each crop you selected. Estimates are acceptable.*

- ☐ Tree Fruit Orchards (non-citrus) \_\_\_\_\_
- ☐ Citrus Groves \_\_\_\_\_
- ☐ Tree Nut Orchards \_\_\_\_\_
- ☐ Vineyards \_\_\_\_\_
- ☐ Other (please specify) \_\_\_\_\_

Carry Forward Selected Choices - Entered Text from "In the past five years, which of the following orchard/vineyard crops have you been involved in, either as a producer or in an advisory capacity? Select all that apply."



**D6.orch** Approximately **how many operations** of the selected crops do you produce and/or advise on?

*Please provide a response for each crop you selected. Estimates are acceptable.*

- ☐ Tree Fruit Orchards (non-citrus) \_\_\_\_\_
- ☐ Citrus Groves \_\_\_\_\_
- ☐ Tree Nut Orchards \_\_\_\_\_
- ☐ Vineyards \_\_\_\_\_
- ☐ Other (please specify) \_\_\_\_\_

Page Break \_\_\_\_\_

**D7.orch** In **which US state(s)** were you involved with production of the crops you selected in the past five years? Select all that apply.

☐

Alabama

☐

Alaska

☐

Arizona

☐

Arkansas

☐

California

☐

Colorado

[Other states listed here]

☐

Other (please specify) \_\_\_\_\_

End of Block: Demographic (Orchard)

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Start of Block: Knowledge PA Tools (Orch)

**T5.orch** Next, we will ask about the **use of targeted pesticide application equipment** in the crops you work with.

**Targeted pesticide application** (also called **precision application**) refers to the use of pesticide sprayers equipped with cameras or sensors that detect weeds or crop canopy to direct spray only to where it is needed.

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Page Break \_\_\_\_\_

**Q1.orch** Please indicate your level of familiarity with the following types of **targeted pesticide application equipment**. Some brand names are listed below but may not include all relevant examples.

**Targeted airblast sprayers:** Examples include Smart Apply™, Weed-It Quadro™

	Not familiar with this technology	Familiar with this technology, but not used on farms I work with	This technology is used on farms I work with.
Targeted airblast sprayers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page Break

*Display this question:*

*If Knowledge of PA tools = Targeted airblast sprayers [ Not familiar with this technology ]*

*And Knowledge of PA tools = Not familiar with this technology*

**T6.orch** Based on your responses, it appears you are not familiar with targeted pesticide application equipment.

Thank you for your time. Your response has been recorded.

*Skip To: End of Survey If Off ramp (Have not heard of PA) Displayed*

**Q2.orch** Do farms you work with use targeted pesticide application through **custom applicators** or do they use their **own precision sprayers**?

	Custom applicators	Own precision sprayers	Both (Custom applicators and own sprayers)
Targeted airblast sprayers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



**Q3.all** How important are each of the following **reasons for adopting** targeted pesticide application equipment?

*Note: ESA strategies refers to Endangered Species Act strategies released by the Environmental Protection Agency, including the Herbicide Strategy and Insecticide Strategy.*

	Very important	Somewhat important	Not important	Don't know / Not sure
Chemical cost savings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reduced water usage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
More effective weed/pest control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Crop safety (reduced crop injury)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Delay weed/pest resistance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Labor savings	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Conservation (e.g., reduce runoff and/or drift)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Points for ESA strategies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use of data for field management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>





**Q4.all** Please rank the following **reasons for adopting** targeted pesticide application equipment from most to least important with **most important = 1**. Note: Only answers selected as "very important" or "somewhat important" in the previous question appear here.

Display this choice: **(Same logic applies to all answer choices)**

*If Reasons to adopt = Chemical cost savings [ Very important ]*

*Or Reasons to adopt = Chemical cost savings [ Somewhat important ]*

- ☐ Chemical cost savings
- ☐ Reduced water usage
- ☐ More effective weed/pest control
- ☐ Crop safety (reduced crop injury)
- ☐ Delay weed/pest resistance
- ☐ Labor savings
- ☐ Conservation (e.g., reduce runoff and/or drift)
- ☐ Points for ESA strategies
- ☐ Use of data for field management
- ☐ Other (please specify)

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Page Break



**Q5.all** How important are each of the following **barriers to adopting** targeted pesticide application equipment?

	Very important	Somewhat important	Not important	Don't know / Not sure
Cost of purchasing equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Access to financing to purchase equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Recurring costs (e.g., annual / per acre fees)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Operation size too small to see positive returns	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Uncertain return on investment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of skilled operators	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of service support to repair equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Increased complexity of pesticide decisions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Insufficient broadband access	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lack of interoperability with other equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Terrain/slope not compatible with equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cannot operate in low light conditions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page Break



**Q6.all** Please rank the following **barriers to adopting** targeted pesticide application equipment from most to least important with **most important = 1**. Note: Only answers selected as "very important" or "somewhat important" in the previous question appear here.

Display this choice: **(Same logic applies to all answer choices)**

*If Barriers to adoption = Cost of purchasing equipment [ Very important ]*

*Or Barriers to adoption = Cost of purchasing equipment [ Somewhat important ]*

- ☐ Cost of purchasing equipment
- ☐ Access to financing to purchase equipment
- ☐ Recurring costs (e.g., annual/ per acre fees)
- ☐ Operation size too small for positive returns
- ☐ Uncertain return on investment
- ☐ Lack of skilled operators
- ☐ Lack of service support to repair equipment
- ☐ Increased complexity of pesticide decisions
- ☐ Insufficient broadband access
- ☐ Lack of interoperability with other equipment
- ☐ Terrain/slope not compatible with equipment
- ☐ Cannot operate in low light conditions
- ☐ Other (please specify)

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Page Break



**Q7.all** What would provide greater **incentive for adopting** targeted pesticide application equipment?

	Large incentive	Some incentive	No incentive	Don't know / Not sure
Ability to use higher "single" application rates of registered pesticides	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to use higher "annual" application rate of registered pesticides	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to use a new pesticide active ingredient not registered for traditional application	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Retrofit kit for existing equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
More information on the actual cost savings from adopting this equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
More information on efficacy of targeted application vs traditional broadcast/airblast	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
More information on Best Management Practices for resistance management when using targeted sprayers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accessible technical support information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Accessible service and repair information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other (please specify)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



**Q8.all** Please rank the following **incentives for adopting** targeted pesticide application equipment from most to least important with **most important = 1**. Note: Only answers selected as "very important" or "somewhat important" in the previous question appear here.

Display this choice: **(Same logic applies to all answer choices)**

*If Incentives to Adopt = Ability to use higher... [ Very important ]*

*Or Incentives to adopt = Ability to use higher... [ Somewhat important ]*

- \_\_\_\_\_ Ability to use higher single application rates of registered pesticides
- \_\_\_\_\_ Ability to use higher annual application rate of registered pesticides
- \_\_\_\_\_ Ability to use a new pesticide active ingredient not registered for traditional application
- \_\_\_\_\_ Retrofit kit for existing equipment
- \_\_\_\_\_ More information on the actual cost savings from adopting this equipment
- \_\_\_\_\_ More information on efficacy of using this equipment vs traditional broadcast/airblast
- \_\_\_\_\_ More information on Best Management Practices when using targeted sprayers
- \_\_\_\_\_ Accessible technical support information
- \_\_\_\_\_ Accessible service and repair information
- \_\_\_\_\_ Higher resale value for equipment
- \_\_\_\_\_ Other (please specify)

Page Break

**Q9.all** Do you have any other information you wish to share about **barriers to adoption** or **incentives for adoption** of targeted pesticide application equipment?

☐ No

☐ Yes (please specify) \_\_\_\_\_

*Skip To: End of Survey If Add'l information = No*

*Skip To: End of Survey If Add'l information = Yes (please specify)*

Page Break

**T7.all** **You have completed the survey! Your responses have been recorded.** OPMP thanks you for sharing your time and expertise with our office. Your cooperation and input to this survey helps our office advocate for growers' needs in discussions with regulators working on ecological risk assessment and mitigation.

If you have other general thoughts you would like to share with us, please reach out to our office at: [sm.opmp.pesticides@usda.gov](mailto:sm.opmp.pesticides@usda.gov). To learn more about OPMP's mission and how our office supports U.S. growers, visit our website at: <https://www.usda.gov/oce/pest/about>. Thank you again!

End of Block: Main (All)