SURVEY REVEALS TRAINING NEEDS FOR AIRBLAST SPRAYER OPERATORS

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Abstract:

Context and purpose of the study – In California, little training in sprayer calibration or pesticide drift management is required to apply pesticides. Yet, there is a need to maximize pesticide efficacy and minimize drift. Therefore, our team is developing a training course on airblast application best practices. We distributed a survey to identify current practices and used importance-performance analysis to interpret responses to the importance of spray related topics and satisfaction with previous training.

Material and methods – In 2018 we solicited survey replies, receiving 219 responses from winegrape and orchard industry members. Respondents rated 18 spray topics using a Likert-type scale. Topic categories included sprayer calibration, weather, techniques to reduce drift, and applicator attitude. Respondents rated 1) how important each topic is to them and 2) how satisfied they are with the quality of training they had previously received; or "no training received". Results were calculated by topic as the mean importance (y) and satisfaction with training (x), and graphed using (x,y) as coordinates. The overall importance and performance means were used to define graph quadrants; the resulting topic placement in the quadrants prioritized training needs. We also asked: "Do you change your sprayer set up?", "What steps do you take to calibrate?" and "Have you experienced a pest control failure that could have been related to a poor spray application?"

Results – Checking spray coverage ranked the most important topic while improving safety ranked highest for satisfaction. Topics fell into quadrants: 1.-high priority: checking coverage, selecting nozzles, reducing costs, and measuring flow; 2.-less emphasis: measuring application rate, measuring speed, improving safety, checking wind speed, reducing drift, and checking pressure; 3.-low interest: reducing spray loss to the ground, adjusting air flow, determining droplet size, checking temperature, determining if an inversion exists, using the low-drift technique "Gear up, Throttle down", and checking relative humidity; 4.-low priority: checking wind direction. Responses to "What steps do you take to calibrate?" included measuring speed (44.9%), spraying out the tank to a known area (35.6%) and checking nozzles (34.7%). Only 8.1% of respondents check coverage and 5.9% admitted not calibrating or not often. 38% do not change their sprayer set-up once the season begins. Over half experienced a pest control failure they suspect was due to poor application; grape powdery mildew had the highest perceived failure. Respondents understand drift is undesirable but assign less importance to practices to reduce drift incidence, possibly due to lack of training received by 6-23%. Our course will focus on high priority topics; and checking weather and equipment to minimize drift.

Keywords: Airblast sprayer, calibration, training, survey

1. Introduction.

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Introduction & Objective

In California, pesticide applicators and/or their supervisors routinely complete pesticide safety training; but little training in sprayer calibration and drift management is required. This is problematic for maximizing pesticide efficacy and managing drift in the millions of acres of winegrapes and tree nuts grown in California and sprayed by air-assist (airblast) sprayers.

To address this need, our team of University of California Agricultural and Natural Resources (UC ANR) advisors, faculty, and statewide academics along with private industry leaders are developing a training course on best practices for airblast applications. **To inform our training program, we developed a survey to identify current practices and critical airblast spray application training needs**.

Methods

Our survey asked respondents to rate 18 spray-related topics using a Likert-type scale (Likert, 1932) and we evaluated their responses using an importance-performance analysis (IPA). IPA asks survey respondents to rate 1) how important each topic is to them and 2) how satisfied they are with their experience or performance of each topic (Martilla and James, 1977). Respondents had the option of checking NA for either "don't know" or "no training received".

We also asked: "Do you change your sprayer set up?", "What steps do you take to calibrate?" and "Have you experienced a pest control failure that could have been related to a poor spray application?" to help us better understand current spray practices.

The survey was distributed to northern CA winegrape and orchard industry members. We received 219 responses from applicators, their supervisors, growers and Pest Control Advisers.

38% of respondents said they do **not** change their sprayer set-up once the season begins.

Results

Topics fell into the following IPA quadrants:

1-high priority: checking coverage, selecting nozzles, reducing costs, and measuring flow;

2-less emphasis: measuring application rate, measuring speed, improving safety, checking wind speed, reducing drift, and checking pressure;

3-low interest: reducing spray loss to the ground, adjusting air flow, determining droplet size, checking temperature, determining if an inversion exists, using the low-drift technique "Gear up, Throttle down", and checking relative humidity;

4-low priority: checking wind direction.

Respondents understand drift is undesirable but assign less importance to practices to reduce drift incidence, possibly due to a lack of training received by 6-23%.

Importance-Performance Analysis results: graphical presentation of all response means
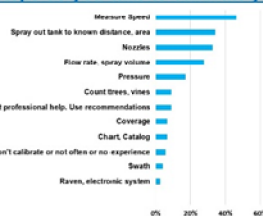
Over half of the respondents experienced a pest control failure they suspect was due to poor application. Grape powdery mildew had the highest perceived failure.

"What steps do you take to calibrate your sprayer"?

Measure Speed
Spray out tank to known distance, area
Nozzles
Flow rate, spray volume
Pressure
Count trees, vines
Get professional help. Use recommendations
Coverage
Chart, Catalog
Don't calibrate or not often or no experience
Swath
Raven, electronic system

Checking spray coverage was the number 1 rated important training topic.

References

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