

NATURAL RESOURCES CONSERVATION SERVICE
INTERIM CONSERVATION PRACTICE STANDARD
PRECISION PEST CONTROL APPLICATION

(Acres)

CODE 718

DEFINITION

The use of technologies that allow substantially improved control of pesticide application rate or post application fate. For example, sensing and control systems on pest control application equipment that can adjust spray output to focus deposition on targets, compensate for variable environmental conditions, alter the application rate in accordance with prior knowledge of the crop or other target, and utilize non chemical pest control.

This primarily consists of technologies and strategies where broadcast application of agrochemicals is replaced by targeted application, control of the application based on sensing of environmental conditions, use of VOC inhibiting techniques, and/or use of non-chemical pest control applications.

PURPOSE

This practice is applied as part of a conservation system. Precision pest control systems shall be used to better ensure applications only strike on and adhere to their targets for any of these purposes:

- Improve air quality by reducing the generation of volatile organic compounds—VOCs, a key precursor to ground-level ozone—through targeted spray applications or other means known to effectively reduce VOC emissions.
- Minimize chemical drift away from the intended target
- Minimize water quality impacts associated with sprayed chemicals reaching water bodies

CONDITIONS WHERE PRACTICE APPLIES

Wherever chemical sprays or soil fumigants are applied in natural and agricultural settings.

CRITERIA

General Criteria Applicable to All Purposes

Precision pest control shall be integrated into applicable conservation plans, as warranted.

All chemical application activities must comply with Federal, State, and local regulations, including compliance with the Food Quality Protection Act (FQPA), Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), and the Worker Protection Standard (WPS).

Where precision pest control includes the use of pesticides, clients will be instructed to pay special attention to all environmental hazards and site-specific application criteria listed on pesticide labels and contained in Extension and Crop Consultant recommendations.

Precision pest control application technologies acceptable for use shall include one or more of the following:

- Near-infrared-based weed sensing systems
- Map-based/GPS variable rate application
- Sonar-based vegetation sensors
- Computer controlled spray nozzles
- Hoods and shields to direct applications
- Wicks
- Backpacks
- Remote sensing, GIS, or other spatial information system
- Steam desiccation systems

Conservation practice standards are reviewed periodically, and updated if needed. To obtain the current version of this standard contact your Natural Resources Conservation Service [State Office](#), or download it from the [electronic Field Office Technical Guide](#) for your state.

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- Fumigant delivery with drip irrigation
- Fumigant soil retention using precision water application after injection.
- Other precision technologies, as approved by NRCS

Application of this practice requires documentation of reductions in pesticide use or VOC before and after application of precision application.

Spray pesticides during periods with light winds and/or lower temperatures to reduce droplet volatilization and amount of time spray droplets are in the air

Many precision pest control systems will utilize a combination of technologies to more precisely apply chemicals. Where applicable, design of multiple technology systems shall follow state extension service, county agriculture commissioner, or other state or local entity guidelines.

Application equipment shall be properly calibrated before utilizing precision applications to reduce chemical drift and minimize VOC production.

Additional Criteria Applicable to Reduce the Total Mass of Chemical Used in a Spraying System

Applicator shall not reduce rates below those prescribed in the product label.

When using wicks to apply a herbicide, all chemical label recommendations and requirements must be followed

Additional Criteria Applicable to Reduce the Generation of VOCs

Document the reductions in VOCs achieved by multiplying the VOC content of the chemical by the reduction in chemical usage, or refer to regulations, label, or peer reviewed literature documenting or recommending techniques used to reduce VOC emissions when reduction in total pesticide application amount is not the objective.

Include an assessment of current weather conditions when evaluating a precision spray

application to reduce generation of VOCs and mitigate off-site drift.

Apply pesticides during periods of higher humidity to reduce evaporation to the air, where higher humidity is regionally specific and above the daily mean for that time of year.

When applicable, apply pesticides in split applications to reduce the amount of chemical applied at one time, which will reduce the potential to generate VOCs from the pesticide application.

Additional Criteria Applicable to Minimize Chemical Drift Away from the Intended Target

Utilize accepted spray droplet size management to provide the largest droplet sizes possible, in conjunction with precision application techniques, to minimize chemical drift.

Include an assessment of current weather conditions when evaluating a precision spray application to reduce chemical drift.

Additional Criteria Applicable to Eliminate Negative Water Quality Impacts Associated with Sprayed Chemicals Reaching Water Bodies

Maintain appropriate, prescribed setbacks (as delineated by local, state, and/or federal statutes) to minimize risk of contamination to water bodies and sources. These setbacks shall be identified on the operator's property maps and included in the operator's conservation plan.

CONSIDERATIONS

Consider utilizing windbreaks around areas where chemicals are being applied to complement the reduced drift potential from precision application.

Use low-drift nozzles and/or lower pressure on chemical spray equipment to further reduce the potential for chemical drift.

Use proven chemical adjuvants to further reduce the potential for chemical drift and associated environmental risks.

Use field scouting and target applications to “hot spots” for overall pesticide application reductions.

Where applicable, this practice should be utilized as part of, and incorporated into, an Integrated Pest Management (IPM) plan on the farm or ranch to which it is being applied.

Use an approved pest forecasting system for application of chemicals to help identify the best times to precisely apply pesticides and reduce chemical drift and VOC generation.

Where applicable, utilize pesticide granules or powders rather than emulsifiable concentrates to reduce VOC generation from the applied pesticide.

When possible, selecting pesticides with low volatility to be used in conjunction with precision application to further reduce VOC emissions from the applied pesticide.

Applying pesticides at night can reduce the potential for VOC production from volatilizing chemicals.

Drip chemigation precisely delivers pesticides directly to their target, and can reduce VOC production by using less pesticide and reducing the volatilization of that pesticide.

Consider using crop rotations to break pest cycles, and reduce the need for chemical applications.

Sprinkler apply water in quarter inch increments with specified number and frequency after injection of soil fumigants.

Cultural Resources Considerations

NRCS policy is to avoid any effect to cultural resources and protect them in their original location. Determine if installation of this practice or associated practices in the plan could have an effect on cultural resources. The National Historic Preservation Act may require consultation with the California State Historic Preservation Officer. <http://www.nrcs.usda.gov/technical/cultural.html> is the primary website for cultural resources information. The California Environmental Handbook and the California Environmental Assessment Worksheet also provide guidance on how the NRCS must account for cultural

resources. The e-Field Office Technical Guide, Section II contains general information, with Web sites for additional information.

Document any specific considerations for cultural resources in the design docket and the Practice Requirements worksheet.

Endangered Species Considerations

If during the Environmental Assessment NRCS determines that installation of this practice, along with any others proposed, will have an effect on any federal or state listed Rare, Threatened or Endangered species or their habitat, NRCS will advise the client of the requirements of the Endangered Species Act and recommend alternative conservation treatments that avoid the adverse effects. Further assistance will be provided only if the client selects one of the alternative conservation treatments for installation; or with concurrence of the client, NRCS initiates consultations concerning the listed species with the U.S. Fish and Wildlife Service, National Marine Fisheries Service and/or California Department of Fish and Game.

PLANS AND SPECIFICATIONS

Specifications for installation of Precision Pest Control Application shall be prepared for each site or planning unit according to the criteria. Specifications shall be recorded using State-developed specification sheets, job sheets, practice requirement sheets, narrative statements in conservation plans, or other acceptable documents.

As a minimum, the plans and specifications shall provide the following:

1. Identification and description of the type of precision technologies to be used
2. List of items to include in weather assessment.
3. Layout and description of any spatial configuration being used (e.g. GPS mapping)
4. Documentation of benchmark chemical use and means of documenting chemical use with precision pest control application methods.
5. List of criteria to follow during application (e.g. apply during light or no winds, during periods of high humidity, use of large droplets).

6. List of things to consider during application (e.g. using higher volumes of water, use of crop rotations, application of chemicals during night, use of low volatility chemicals).

OPERATION AND MAINTENANCE

A plan for operation and maintenance (O&M) of the precision pest control application shall be prepared. The plan shall be consistent with the purposes of the type of precision technology chosen, intended life, safety requirements and design criteria. The plan shall contain requirements including but not limited to:

1. Continued use of precision spray technology after the first year.
2. A description of the normal operation, safety concerns and maintenance requirements, including periodic inspection, cleaning and maintenance requirements of precision technology equipment (e.g. GPS equipment, hooded sprayers).
3. Repair procedures.
4. Documentation requirements for annual chemical use.

REFERENCES

NRCS National Air Quality and Climate Change Technology Development Team, National Technical Support Center, Portland, Oregon