United States Department of Agriculture
Natural Resources Conservation Service

2011 Ranking Period 1

Air Quality Enhancement Activity – AIR06 – Replacing oil- and wood-fired heaters in orchards and vineyards

Enhancement Description
Replace oil- or wood-fired heaters in orchards and vineyards to reduce particulate matter emissions from frost protection.

Land Use Applicability
Cropland

Benefits
Oil- and wood-fired heaters are used in orchards and vineyards for frost protection. Oil-fired heaters (sometimes known as "smudge pots") include those burning diesel, kerosene, waste oil, and any other petroleum-based oils. Oil- and wood-fired heaters are relatively inefficient combustion sources that can produce excessive particulate matter emissions. Newer technologies for frost protection, such as fans, wind machines, and cleaner-burning heaters (e.g., propane-fired heaters) will either eliminate or greatly reduce particulate matter emissions. Additionally, the newer technologies are typically more energy-efficient, resulting in potential economic savings to the producer.

Criteria

1. Producer must provide an analysis of the frost protection needs for the orchard or vineyard. This analysis shall include, at a minimum:
   a. Examination and identification of the areas at the orchard/vineyard with the greatest potential for cold air pooling and vulnerability to freezing temperatures, including both topographical and meteorological effects, and
   b. Review of replacement devices, including the following:
      i. Type of replacement devices to be installed,
      ii. Number of replacement devices with a short description of the reasoning for the proposed number, and
      iii. Recommended locations for replacement device installation, based on the examination of areas to be protected from frost conditions.
2. Producer must install the replacement equipment with clean burning alternatives such as propane powered heaters in accordance with the frost protection needs analysis.
3. Oil- and wood-fired heaters that have been replaced must be destroyed.

Documentation Requirements

1. Frost protection needs analysis (see description in Criteria section above)
2. Numbers and types of replaced oil- and wood-fired heaters
3. Numbers and types of replacement frost protection equipment

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IDAHO ADDENDUM 2011
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The following are acceptable alternatives to smudge pots and oil or wood fired heaters:

- Fans
- Wind machines
- Propane-fired heaters
- Natural gas-fired heaters
- Microwave - radiant heating systems
- Pulse jet heaters using propane

For additional information, refer to the following documents:

FAO , Natural Resources Management and Environment Department. *Frost protection: Fundamentals, practice and economics (Volume 1), Chapter 2 – Recommended methods of frost protection.* http://www.fao.org/docrep/008/y7223e/y7223e08.htm#TopOfPage

University of Idaho Bulletin 867, *Growing tree fruits in short season gardens.* http://www.cals.uidaho.edu/edcomm/pdf/BUL/BUL0867.pdf

Wine Business Monthly (Jan 2010), *Managing the air – frost protection*. http://www.winebusiness.com/wbm/?go=getArticle&dataId=71304

This activity may NOT be used with the following enhancements: ANM21, ANM22, ANM23, SOE01, SOE03, SQL06, and CCR99.

No potential duplicate practices.