USDA NRCS
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Natural Resources Conservation Service

Environmental Quality Incentives Program

Air Quality Initiative

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The Clean Air Act and Criteria Pollutants - What are they?

U.S. EPA has used health-based criteria to establish National Ambient Air Quality Standards (NAAQS). The U.S. EPA has developed NAAQS for six criteria air pollutants, but the primary criteria pollutants of concern for agriculture are ***particulate matter*** and ***ozone***.

Why is it important?

Air quality concerns are measured and managed within defined geographic areas. Areas designated as ***nonattainment areas***, indicate concentrations of a criteria pollutant within this locale are not in compliance with the NAAQS. Consequently, these pollutants are subject to greater regulatory scrutiny than areas that are in compliance with the NAAQS (i.e., attainment areas).

What can be done about it?

Ozone is not typically emitted directly from air pollutant emission sources. Rather, ozone is formed in the atmosphere by chemical reactions. Emissions of precursors, such as oxides of nitrogen (NO_x) and Volatile Organic Compounds (VOCs), lead to ozone formation which is regulated. Particulate Matter (PM) may be emitted directly through dust or smoke, or formed in the atmosphere from other pollutants, such as ammonia, NO_x, VOCs, and sulfur dioxide (SO_2). Agriculture does not produce significant amounts of SO_2, but reducing emissions of directly-emitted particulate matter, NO_x, ammonia, and VOCs from agricultural sources will help mitigate agriculture's contribution to concentrations of particulate matter and ozone in the ambient air.

Clean Air Act – Criteria Pollutants at a Glance

Problems/Indicators – Nonattainment area for ozone and/or particulate matter	
Causes	Solutions
• Dust emissions • Engine emissions • Ammonia release • VOC emissions	• Dust control, windbreaks • Reduce tillage operatons • Proper manure management • Proper nutrient management

USDA NRCS is an equal opportunity employer and provider.

As NRCS moves to include air quality and atmospheric change into conservation planning efforts with farmers and operators on private lands, we are currently focused on two main components of air resources --Particulate Matter and Ozone Precursors.

Particulate Matter (PM)

PM can be emitted directly (i.e., dust) or formed within the atmosphere by the chemical reaction of pollutants such as sulfur oxides (SO_x), nitrogen oxides (NO_x), volatile organic compounds (VOCs), and ammonia. Animal operations can influence PM in a variety of ways.

- Animal activity can produce dust emissions which can be carried by wind or building ventilation.
- Storage, handling, and the breakdown or decomposition of feed, bedding material, and manure can produce dust emissions as well as the emission of VOCs, ammonia, and NO_x.
- Fuel combustion, or the burning of biological material can produce fine PM as well as NO_x and VOCs.
- Manure decomposition and its application on the land can produce emissions of VOCs, ammonia, and NO_x.

Ozone Precursors

VOCs and NO_x are also precursors to ozone, meaning they are pollutants from which ozone is formed. Some ways that animal operations can contribute to VOC and NO_x formation are:

VOCs

- All living organisms (including animals) emit VOCs naturally.
- The breakdown or decomposition of biological materials such as manure or feed can produce VOCs.
- Incomplete fuel combustion or the burning of biological material can produce VOCs.

NO_x

- Fuel combustion or the burning of biological material can produce NO_x.
- The breakdown or decomposition (mainly nitrification/denitrification) of biological materials such as manure or feed can lead to NO_x formation.

For more information on the Air Quality Initiative contact your local USDA Service Center or visit the USDA NRCS web site at: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/programs/financial/air/?&cid=nrcs143_008546