Jefferson County Smoke Management Pilot Balloon Observations, 2008

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Abstract

Pilot balloon (Piball) observations are a major component of the daily decision-making process used in managing open field burning of grass seed and wheat fields in Jefferson County. Piballs are used to track local wind direction and speed. Piballs are released daily from the Central Oregon Agricultural Research Center and the Culver Fire Department between 10:00 a.m. and 2:30 p.m. Piball releases allow for more accurate decisions under marginal conditions. The Piball is essential in minimizing adverse smoke impacts on the local communities.

Introduction

The Piball program that began in 1998 incorporates weather balloon information into the daily routine along with the information the Jefferson County Smoke Management Team receives from the Oregon Department of Agriculture Weather Center. The objective is to provide real-time wind pattern, wind speed, and wind direction information to assist the Smoke Management Coordinator in making a decision whether or not to allow burning. The Smoke Management Program's goal is to prevent smoke intrusion into the local communities and yet allow growers to burn their fields in a timely manner.

During the 2008 burning season there was a total of 13,492 acres burned, 5,910 acres of grass, and 7,582 acres of wheat. Emphasis is put on allowing more burning on the better burn days and not allowing burning on the marginal days, when smoke could impact the local communities. During 2008, open field burning began on July 28and ended on September 25. Due to cold spring weather the harvest was late and the fields were not ready to be burned until later in the season.

Materials and Methods

During the 2008 season, balloons were released between two to four times daily. First release was in the morning at approximately 10:00 a.m. at the Culver Fire Department, with occasional releases sent up in the afternoon. Other balloon releases occurred at various times between 10:30 a.m. and 3:00 p.m. at the Central Oregon Agricultural Research Center. On heavy burning days, the Piball was put up each hour, on-the-hour. For fields with various influences such as wind, location, and topography, balloons were released onsite at the edge of the field for accurate readings. The release times were requested daily from the Smoke Management Coordinator.

During Piball releases, wind direction and speed are determined at 1-min intervals for a period of 10 min using an observation Theodolite System and a 26-inch-diameter helium-

filled balloon. These readings go into the software program, Piball Analyzer, which analyzes the data in three different components. The first is the Piball Sounding, a spreadsheet translating the azimuth and elevation readings from the Piball into wind direction and average wind speeds. The second is the hodograph, which charts wind direction, and third is the Profile page, which graphs wind speed. The results are provided to the Jefferson County Smoke Management Coordinator, who uses this information to determine the field burning status.

Results

The Piball program is an important tool to determine real-time conditions. It is particularly helpful on marginal burn days to assist the program coordinator in making the decision whether to allow burning when conditions are either changing or hard to determine visually. Using the Piball and having it available for release prior to making the final decision has proven to be a valuable tool.