

Oregon
Department
of Agriculture

SUMMARY OF THE 2011 FIELD-BURNING SEASON

**Oregon Department of Agriculture
Natural Resources Division
Smoke Management Program**



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Summary of the 2011 Field-Burning Season

Prepared By

The Oregon Department of Agriculture
Natural Resources Division
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1. Introduction

This summary is prepared annually by the Oregon Department of Agriculture (ODA) Smoke Management Program staff to report the statistics for each field-burning season.

2. Weather Discussion - Prepared by the Oregon Department of Forestry Weather Office

Predicting weather patterns that will promote the lifting and evacuation of smoke out of the Willamette Valley, and away from populated areas, is vital to the efficient operation of the Smoke Management Program. This complex process is further complicated by limited weather data, rapidly changing weather conditions, errors in computer model forecasts, and unpredictable eddies of smoke down-mixing.

This was the second summer open field burning was limited to the Silverton Hills region of the northern Willamette Valley. The summer of 2011 was noted for a lack of days with favorable atmospheric conditions to ventilate field-burning smoke from the Willamette Valley. There were few days conducive to the burning of large acreages. However, enough marginal burning opportunities were utilized to open field burn a total of 11,806 acres, before the season ended on September 29.

JUNE and JULY

Cool and occasionally damp conditions persisted through June and into the first half of July (See Figures 1 and 2). A rare rainstorm dumped between one-half and one inch of rain across the Willamette Valley on July 16 and 17, which lead to delays in the grass seed harvest. Weather conditions turned more summer-like during the last week of July. No open field burning was conducted in June or July.

AUGUST

Temperatures remained below normal until the second half of August. There were no “heat-waves” during the month. The Salem Airport recorded a high temperature of 96 degrees on August 20, which turned out to be the warmest day of the entire summer. In stark contrast to the spring and early summer, August was a dry month in the Willamette Valley. The Salem Airport recorded measurable precipitation of eleven-hundredths of an inch on August 26.

During the first three weeks of August, weather patterns were not conducive to burning large amounts of acreage, but dry conditions did allow for burning small amounts of acreage.

On August 1, there were 96 acres open field burned; on August 2, 154 acres were burned; and on August 4, 519 acres were burned. No smoke impacts were recorded on area nephelometers.

During the second week, light westerly flow aloft allowed for several days of minor burning. August 8, 9, and 12 allowed for a total of 183 acres to be burned. A more significant day of burning on August 10 allowed 406 acres to be burned. Again, no smoke impacts were registered.

During the third week of August, afternoon mixing heights were high, but mostly northerly transport winds limited burning, and only allowed for a total of 41 acres of open field burning August 15, 16, and 18. Transport winds turned northwesterly to allow 298 acres to be burned on August 17. No smoke impacts were registered for the week.

Warmer-than-normal conditions dominated from August 20 through August 28. Westerly transport wind directions were favorable on August 22, but burning was limited to 143 acres due to marginal atmospheric lift. There were no smoke impacts. On August 23, atmospheric lifting allowed for the burning of 296 acres with 1 hour of light and 1 hour of moderate smoke impact in Lyons. Northerly transport winds during the remainder of the week allowed for 89 acres of preparatory burning on August 25. Unfavorable transport winds limited burning to 69 acres on August 29 and 99 acres on Tuesday, August 30 with no smoke impacts registered.

A cool, but dry upper-level trough on August 31 produced the most favorable burning conditions of what had been a very difficult month for smoke evacuation. With 1 hour of light and 1 hour of moderate smoke impacts recorded in Lyons, 2,283 acres were burned.

SEPTEMBER

September started off unseasonably warm and dry, but without any scorching hot days. The Salem Airport recorded high temperatures in the 90s on eight of the first eleven days, with a maximum of 95 degrees on September 10. No field burning was conducted during the first eleven days in September.

On September 12, more seasonal weather returned and continued for the remainder of the month. Open field burning was conducted on September 12 with 640 acres burned; September 13, 41 acres were burned; and on September 14, 107 acres were burned. Area nephelometer readings were already elevated due to wildfire smoke; nevertheless, 1 hour of light and 1 hour of moderate smoke impacts were registered in Lyons, and Sweet Home recorded 3 hours of light smoke impacts on the afternoon of September 13. However, these impacts may have been due to wildfire smoke. Lyons also registered 1 hour of moderate smoke impact on September 14.

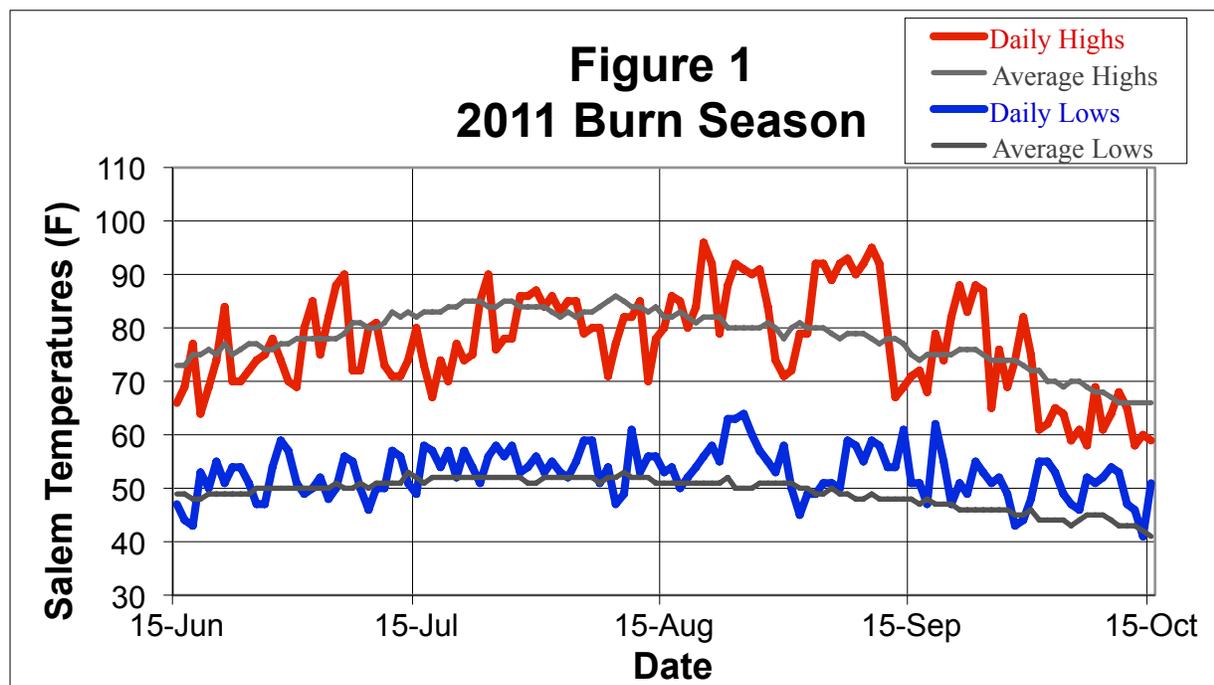
A trace of rain fell each day from September 14 through September 20, as a strong upper-level ridge of high pressure moved east of the state. A weak cold front provided favorable burning conditions on September 15. A total of 3,513 acres were burned with 6 hours of light smoke impacts in Lyons. On September 16, in the wake of the cold front, an upper-level trough allowed for the burning of another 1,433 acres. The nephelometers in Lyons registered 2 hours of moderate and 1 hour of light smoke impacts from open field burning.

Very light rain fell across the northern Willamette Valley September 18-19, but rainfall totals were generally less than one-tenth of an inch. On September 22, transport winds turned onshore due to a dry, increasing southwesterly flow, and allowed for 726 acres to be burned without creating smoke impacts. Lyons registered 1 hour of light and 1 hour of moderate smoke impacts on September 23, as a result of burning 566 acres. Damp weather prohibited any burning September 25-27. September 25 was the only day with more than one-tenth of an inch of rain (.16" at the Salem Airport). Light south-southwesterly transport winds allowed for the burning of all remaining ready fields totaling 69 acres on September 29 with no smoke impacts registered.

OCTOBER

An abrupt switch to cool and wet weather began on October 1, ending the 2011 field-burning season.

Figure 1
2011 Burn Season Temperatures



Definitions

Type: Open Field Burning

- **Identified Species:** Research has identified some species of grass seed that cannot be profitably produced without thermal sanitation. These identified species are Chewings Fescue, Creeping Red Fescue, and Highland Bentgrass.
- **Steep Terrain:** Fields located in the Willamette Valley where grass seed or cereal grain is grown; however, because of the steepness of the terrain, it is extremely difficult to apply alternatives to open field burning.

Type: Propane Flaming

- The process of sanitizing (burning) fields planted in regular or identified species with a propane flamer: a mobile, fire-producing, sanitation device.

4. Enforcement

The 2011 field-burning season marked the fourteenth year that ODA has performed the enforcement function of the Smoke Management Program. This is stipulated under a Memorandum of Understanding with the Oregon Department of Environmental Quality, pursuant to Oregon Revised Statutes 468A.585.

There were five enforcement contacts during the 2011 field-burning season. Two resulted in Letters of Warning. One resulted in a Notice of Non-compliance, and the other two resulted in Civil Penalty Assessments.

5. Smoke Impacts

It is the goal of the ODA Smoke Management Program, with the cooperation of the Willamette Valley grass seed and cereal grain growers, to reduce and/or eliminate smoke impacts in all populated areas. The combination of accurate weather prediction for open field burning, ODA field personnel observations, and grower experience all contribute to alleviate smoke impacts; however, smoke impacts still occur. Unexpected wind shifts; changes in mixing heights, transport wind speed, and wind direction; along with inefficient lighting techniques, can all contribute to the occurrence of impacts.

The number of hours recorded for smoke impacts in cities monitored for smoke intrusions in 2011, are outlined in Figure 4.

Figure 4
2011 Open Field Burning Impacts*

Date	Acres Burned	Impact Hours			Location
		Heavy	Moderate	Light	
August 23	296		1	1	Lyons
August 31	2,283		1	1	Lyons
September 13	41		1	1	Lyons
September 13	41			3	Sweet Home
September 14	107		1		Lyons
September 15	3,513			6	Lyons
September 16	1,433		2	1	Lyons
September 23	566		1	1	Lyons

6. Complaints

Open field burning complaints received from Willamette Valley residents by the Smoke Management Program, totaled 125 for the 2011 field-burning season. Figure 5, identifies the number of field burning complaints originating from individual cities for the 2011 field-burning season.

Figure 5
2011 Open Field Burning Complaints by City

Albany	1	Southern	
Detroit	0	Willamette Valley	0
Eugene/Springfield	0	Salem/Keizer	3
Idanha	1	Scio	4
Lebanon	0	Silverton	10
Lyons/Mehama	52	Stayton	30
Mill City/Gates	12	Sublimity	4
Other	6	Unknown	2
Portland Metro	0	Total	125

*As defined in Oregon Administrative Rule (OAR) 603-077-0105, cumulative hours of smoke impact result in hourly nephelometer measurements that exceed 1.8×10^{-4} b-scat above the average prior 3-hour background levels. For the purposes of this report, “heavy” hours of smoke impact are 5.0×10^{-4} b-scat or more above background (equivalent to visual range of 5 miles or less); “moderate” hours of smoke impact are 1.8×10^{-4} to 5.0×10^{-4} b-scat above background (equivalent to visual range of 12 miles or less); and “light” hours of smoke impact are 1.0×10^{-4} to 1.8×10^{-4} b-scat above the background. “Light” hours of smoke impact were not recorded before the 1999 season. The terms “light,” “moderate,” and “heavy” as used in relation to smoke impacts, are not defined in OAR, but are used by ODA to quantify the level of smoke impact on residents of the Willamette Valley. Nephelometers are located in Carus, Eugene, Lyons, Portland, Salem, Silverton, Springfield, and Sweet Home.

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