

SUMMARY OF THE 2001 FIELD BURNING SEASON

Prepared By

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Natural Resources Division
Smoke Management Program**

Introduction

This summary is developed at the end of each field burning season and is used to report season conditions as well as the amount of acreage registered and burned.

Weather Summary

June was generally cooler and wetter than normal, mean monthly temperatures were mostly 1-4 degrees below normal. Even with the above-normal rains, the state continued to face significant water problems. July was a generally pleasant summer month, with near-normal temperatures. Precipitation totals were typical of July, which is historically the driest month of the year. August was a warm summer month, much warmer than June or July. Most of Oregon was relatively dry in August, although some big storms late in the month brought significant precipitation to parts of western Oregon. During the latter half of August, and continuing into September, the Willamette Valley was often under an inversion, which made for difficult field burning conditions. September was a warm month in most of Oregon, and generally drier than average. Most monthly temperatures were 1.5-4 degrees above normal. The water year ended as one of the driest ever; drought conditions continued across the entire region.

Acreage Registered and Open Field Burned

The 2001 burn season marked the fourth year of the last step of the acreage phase down instituted by the 1991 Legislature, with 40,000 acres allowed to be open field burned and another 25,000 acres available for steep terrain and identified species open field burning. Research has identified some species of grass seed that cannot be profitably produced without thermal sanitation. Also, there are areas in the Willamette Valley where it is extremely difficult to apply alternatives to open field burning because of a lack of available equipment that can be used on steep terrain.

Open Field Burning

In the 2001 burn season 79,756 acres were registered for open field burning compared to 76,561 acres in 2000. Registration included 57,477 acres of regular open field burning, 789 acres of steep terrain, and 21,490 acres of identified species. Growers exceeded the regular limitation of 40,000 acres, therefore, the regular open field burning allocation rate

for 2001 was 72%. The allocation rate for identified species and steep terrain for 2001 was 100%.

A total of 52,934 acres were open field burned during the 2001 burn season (33,810 regular limitation, 462 steep terrain, and 18,662 identified species). By comparison, 50,801 acres were burned in 2000, 49,999 acres were burned in 1999, 46,299 burned in 1998, and 56,878 burned in 1997.

Overall, open field burning was concentrated into a very few days. There were 18 open field burning days authorized in 2001 in which more than 300 acres were open field burned. This compares to 17 days in 2000, 19 days in 1999, 21 days in 1998, and 20 days in 1997. During 2001, an average of approximately 2,787 acres were open field burned each authorized day. That compares with 2,726 acres per day in 2000, 2,303 acres per day in 1999, 2,205 acres per day in 1998, and 2,844 acres per day in 1997.

2001 Open Field Burn Crop

Species	Burned	% of Total
Annual Ryegrass	25,252	47.70%
Chewings Fescue	10,944	20.67%
Creeping Red Fescue	6,059	11.45%
Perennial Ryegrass	5,501	10.39%
Tall Fescue	2,227	4.21%
Highland Bentgrass	1,659	3.13%
Cereal Grain	835	1.58%
Orchardgrass	196	0.37%
Fine Fescue	251	0.47%
Kentucky Bluegrass	10	0.02%
Total	52,934	99.99%

Propane Flaming

The maximum allowable acreage to be propane flamed is 37,500 acres (as set by the 1995 Legislature). In 2001, growers registered about 8% (2,965 acres) of the allowable acreage for propane flaming and burned 4% (1,627 acres) of the limitation. This compares to 8% (2,875 acres) registered and 6% (2,124 acres) burned in 2000, 10% (3,575 acres) registered and 5% (1,939 acres) burned in 1999, 17% (6,494) registered and 11% (4,033 acres) burned in 1998, and 8% (6,027 acres) registered and 4% (2,921 acres) burned in 1997. (Note: The statistics for propane flaming prior to 1998 were developed from the 75,000 acre limitation.)

2001 Propane Flame Burn Crop

Species	Burned	% of Total
Perennial Ryegrass	816	50.15%
Tall Fescue	302	18.56%
Annual Ryegrass	151	9.28%
Chewings Fescue	120	7.38%
Highland Bentgrass	67	4.12%
Kentucky Bluegrass	79	4.86%
Creeping Red Fescue	92	5.65%
Total	1627	100%

Stack Burning

Stack burning does not have an imposed acreage limitation nor is registration required. Growers are obliged to secure an air quality permit containing the responsible party's name, location of the burn, and acreage represented by the accumulated residue prior to ignition. As of October 27, 2001, growers stack burned 691 acres. Previous years are as follows:

Year	Interim	Final
	Oct. 27 th	March 31st
1996/97	2,757	7,535
1997/98	4,310	7,628
1998/99	4,116	5,021
1999/00	3,120	3,825
2000/01	921	1,050
2001/02	691	Not Applicable

Total Annual Thermal Sanitation

Burn Type	2001	2000	1999	1998	1997
Open Field Burning	52,934	50,801	49,999	46,299	56,878
Propane Flaming	1,627	2,124	1,939	4,033	2,921
Stack Burning	1,200*	1,050	3,825	5,021	7,628
Total Sanitation	55,761	53,975	55,763	55,353	67,427
Percent Change	+03%	-03%	+01%	-21%	-21%

* Estimated Stack Burn Acreage

Enforcement

The 2001 burn season marked the fifth year that the Department has performed the enforcement function of the Smoke Management Program (as stipulated under a Memorandum of Understanding with the Department of Environmental Quality, pursuant to Oregon Revised Statutes 468A.585).

There were 10 enforcement contacts during the 2001 season, resulting in 14 violations. This compares with three contacts during the 2000 season, resulting in five violations, four contacts during the 1999 season, resulting in four violations, and 26 contacts during the 1998 season, resulting in 26 violations.

After evaluating the factors involved in each case during the 2001 season, there were three informal warnings issued, six letters of warning issued, and five civil penalties pending.

Three informal warnings were issued for property damage. Letters of warning were issued for two improper training fires, two fire safety watch violations, burning contrary to burn schedule, and a water truck violation. Civil penalties were issued for no water trucks, two improper fire safety watches, no burn permit, and improper registration. The aggregate civil penalty assessment was \$14,250.

Smoke Impacts and Complaints

In general, smoke intrusions into populated areas result from a simple unexpected shift in winds, or from a combination of meteorological factors, which have the effect of reducing both vertical rise and horizontal dispersion of smoke. This may occur when the atmosphere is becoming more stable, such as after the passage of a storm front or an upper level trough, which is not always easily observed. When this happens, the mixing height of the atmosphere (altitude to which smoke will freely rise) lowers, sometimes trapping smoke below. Wind speeds at the transport level may drop off dramatically, often with no sustained direction, allowing smoke from three or four thousand feet to mix back to the surface. This often occurs 10 to 20 miles downwind from open field burning areas and can be aggravated by differential heating, turbulence, and channeling that develops along the Cascade foothills.

The intrusions in 2001 occurred on 21 days, (16 hours of light impact and one hour of moderate impact occurred on four of these days when less than 300 acres were burned) compared to eight days in 2000, six days in 1999, six days in 1998, and two days in 1997. The number of hours of significant* smoke impact in cities monitored for smoke in 2001 were: Lyons (11 hours), Sweet Home (2 hours), and Oregon City (2 hours). Light** smoke impact occurred in Lyons (56 hours), Sweet Home (5 hours), and Oregon City (2 hours). Portland, Salem, Eugene, Springfield and Corvallis recorded no days of smoke impact.

Open field burning complaints received from Willamette Valley residents by the Smoke Management Program totaled 608 for the 2001 season. (The high number of open field burning complaints this season is attributed to abrupt weather changes during the later half of August.) That compares to 477 complaints in 2000, 249 complaints in 1999, 282 complaints in 1998, and 373 complaints in 1997.

Significant hours of smoke impact are defined as resulting in hourly nephelometer measurements exceeding 1.8×10^{-4} B scat above the prior 3-hour background.

***Light** hours of smoke impact are defined as resulting in hourly nephelometer measurements exceeding 1.0×10^{-4} B-scat above the prior 3-hour background.

2001 Comparative Annual Open Field Burning Data

	2001	2000	1999	1998	1997
Acres Registered	79,756	76,561	75,382	80,630	89,187
Acres Burned	52,934	50,801	49,999	46,299	56,878
Most burned in one day	7,958	10,391	7,217	8,157	9,893
Burn days accounting for 75% of total acres	9	6	9	9	7
Weekend burn days allowed	0/28	0/26	0/24	0/22	0/20
Number of Burn Days					
300 – 1,000 acres	5	8	7	12	7
1,000 – 5,000 acres	10	6	9	7	9
5,000 – 10,000 acres	3	2	3	2	4
10,000 or greater	0	1	0	0	0
Total Burn Days	18	17	19	21	20
Smoke Impact Hours					
*total/heavy/mod./light (#days)					
Portland	0/0/0/0	0/0/0/0	0/0/0/0	0/0	0/0
Salem	0/0/0/0	0/0/0/0	0/0/0/0	0/0	0/0
Corvallis	0/0/0/0	0/0/0/0	0/0/0/0	0/0	0/0
Lyons	11/0/11/56(17)	4/0/4/5(5)	5/0/5/0(3)	7/1(4)	15/0(2)
Sweet Home	2/0/2/5(3)	5/0/5/2(3)	4/1/2/0(1)	9/1(2)	0/0
Eugene	0/0/0/0	0/0/0/0	2/0/0/2(1)	0/0	0/0
Springfield	0/0/0/0	0/0/0/0	2/0/0/2(1)	0/0	0/0
Oregon City	2/0/2/2(1)	0/0/0/0	0/0/0/0	0/0	0/0
Total	15/0/15/63(21)	9/0/9/7(8)	13/1/7/4(6)	16/2(6)	15/0(2)
Smoke Complaints					
Open Field Burning					
Portland/Salem	31	33	3	9	18
Albany/Corvallis	11	18	4	7	5
Lebanon/Sweet Home	55	75	45	57	28
Eugene/Springfield	274	239	144	54	117
Other (North Valley)	112	47	18	36	41
Other (South Valley)	125	65	35	119	164
Total Complaints	608	477	249	282	373

*Total includes hourly nephelometer measurements exceeding 1.8×10^{-4} B-scat above prior 3-hour background; equivalent to visual range of 12 miles or less.

“Heavy” hours are 5.0×10^{-4} B-scat or more above background; equivalent to visual range of 5 miles or less. (One hour of heavy smoke impact is equal to two hours of moderate smoke impact.)

“Moderate” hours of smoke impact are defined as resulting in hourly nephelometer measurements exceeding 1.8×10^{-4} B-scat above the prior 3-hour background; equivalent to visual range of 12 miles or less.

“Light” hours of smoke impact are defined as resulting in hourly nephelometer measurements exceeding 1.0×10^{-4} B-scat above the prior 3-hour background. “Light” hours of smoke impact were not recorded prior to the 1999 season.

**Open Field Burning Complaints and
Wind Direction Correlation (over 300 acres)**

Date	Location	Acres	Wind Direction/ Degrees	F/P/S/G*	Smoke Impact Hours **total/heavy/mod./light	
7/16	Linn, Marion	2,678	NW/300	5/0/0/0		
7/17	Linn, Marion, Clackamas	2,941	NW/300	12/0/0/0	Lyons	0/0/0/3
7/18	Linn, Marion	502	NW/310	3/0/0/0	Lyons	0/0/0/2
7/20	Linn, Marion, Lane	6,357	NW/310	45/0/0/1	Lyons	0/0/0/1
8/1	Linn, Marion	7,958	W/260	36/0/0/0	Lyons Sweet Home	0/0/0/2 1/0/1/3
8/2	Linn, Marion, Clackamas	4,359	W/260	25/0/0/0	Lyons	2/0/2/3
8/3	Linn, Marion, Clackamas, Yamhill	3,995	W/250	8/0/0/0	Lyons	0/0/0/1
8/6	Linn, Marion	836	W/290	8/0/0/0		
8/20	Linn, Marion, Lane, Clackamas, Yamhill, Benton	4,250	W/290	71/0/0/0	Lyons	3/0/3/6
8/21	Linn, Marion, Lane, Clackamas, Yamhill	5,595	S/190	87/0/0/0	Lyons Sweet Home Oregon City	2/0/2/6 0/0/0/2 2/0/2/2
8/30	Linn, Marion, Polk, Clackamas, Benton	1,679	NW/320	4/0/0/0	Lyons	0/0/0/2
8/31	Linn, Marion, Yamhill	2,133	NW/300	16/0/0/0	Lyons	3/0/3/5
9/4	Linn, Marion, Benton	761	N/340	0/0/0/0	Lyons	0/0/0/1
9/6	Benton, Marion	552	E/70	31/0/0/0		
9/7	Linn, Marion, Benton	1,751	SE/150	99/0/0/0		
9/20	Linn, Marion, Lane	2,285	N/360	3/0/0/0	Lyons	0/0/0/5
9/24	Linn, Marion	1,168	SE/150	3/0/0/0	Lyons Sweet Home	0/0/0/3 1/0/1/0
10/5	Linn, Marion	372	W/280	1/0/0/0		

*F/P/S/G are complaints pertaining to open field burning/propane flaming/stack burning/general air quality.

**Total includes hourly nephelometer measurements exceeding 1.8×10^{-4} B-scat above prior 3-hour background; equivalent to visual range of 12 miles or less.

“Heavy” hours are 5.0×10^{-4} B-scat or more above background; equivalent to visual range 5 of miles or less. (One hour of heavy smoke impact is equal to two hours of moderate smoke impact.)

“Moderate” hours of smoke impact are defined as resulting in hourly nephelometer measurements exceeding 1.8×10^{-4} B-scat above the 3-hour background; equivalent to visual range of 12 miles or less.

“Light” hours of smoke impact are defined as resulting in hourly nephelometer measurements exceeding 1.0×10^{-4} B-scat above the prior 3-hour background. “Light” hours of smoke impact were not recorded prior to the 1999 season.

Note: For the 2001 season light impacts occurred on four days where less than 300 acres were burned.