



# Arkansas Voluntary Smoke Management Guidelines for Row Crop Burning

Adapted from voluntary Arkansas Smoke Management Guidelines for Arkansas forests, from the Arkansas Prescribed Fire Council.



# BEFORE YOU BURN

## DO...



Complete Safe Burning Checklist before you burn. *See back page for checklist.*



Report your crop burn to the Department Dispatch Center at 1-800-830-8015.

## DO NOT...

**DO NOT BURN** if winds exceed 15 mph.

**DO NOT BURN** if humidity is below 20%.

**DO NOT BURN** when the wind direction could send smoke directly into roadways or communities.

**DO NOT** leave your fire unattended.

## WHY DO FARMERS BURN?

- Crop burning is helpful in managing problematic residue, which if left untouched can result in increased tillage and delayed planting in the next season.
- Crop burning eliminates pests and diseases that can be detrimental to future crops.
- Crop burning removes organic refuse after harvest, which prepares fields for the next growing season.
- Crop burning is an efficient and economical control method for insects and weed seeds.
- Burning can allow for no-till or reduced-till planting the next growing season, reducing carbon footprint in diesel use and reducing soil erosion potential.

**The use of prescribed fire in Arkansas’s cropland can be an important part of a crop management plan in row crops such as rice, wheat, corn, cotton, and soybeans. The use of prescribed fire (a pre-planned, managed fire) to accomplish specific crop management objectives — mainly the removal of stubble —is regarded as a valuable tool for farmers.**

- “Smoke management” means the conducting of a prescribed fire under fuel moisture, meteorological conditions, and firing techniques that keep the impact of the smoke on the environment within acceptable limits.
- Smoke management planning helps reduce smoke impact on roadways, nearby towns, and sensitive areas like schools, nursing homes, churches, and other facilities.
- For a cleaner burn, it is optimal to wait up to four days so that the stubble can be manipulated to reflect a lower fuel moisture.
- These guidelines help inform farmers on how to complete a Safety Checklist and create a report to the Arkansas Department of Agriculture Dispatch Center that will ensure the most optimal conditions for safe crop burns.



# BEFORE YOU BURN: CALL 1-800-830-8015

# VOLUNTARY SMOKE MANAGEMENT PROCEDURES

## Why have a voluntary smoke management program?

Using these voluntary Smoke Management Guidelines helps to assure that air quality and human health are not compromised by smoke from crop burns. In 1997, the Environmental Protection Agency (EPA) determined that the fine particles contained in smoke (commonly called PM2.5) can cause health effects when breathed at high concentrations and also contributes to the haze that sometimes interferes with visibility conditions in scenic parks and wilderness areas. For these reasons, the EPA established a National Ambient Air Quality Standard for PM2.5. Air quality around Arkansas is monitored to assure that the standard for PM2.5 is protected and good air quality is maintained.

Planning is the first step in a well-managed burn. Estimating the tons of fuel that can be burned in a given air-shed (36 square miles) depends on knowing what the weather conditions will cause the smoke do. Using these simple guidelines can help preserve air quality in the State of Arkansas.

## Determine fuel type and total available fuel loading

*Fuel loading – total amount of fuel at the prescribed burn site.*

The emission data needed by the Arkansas Department of Agriculture Dispatch Center is the consumption of “available” fuels for the entire burn. (Available fuel loading per acre x total acres to be burned = total available fuel loading for the burn.)

**Table 1: Common fuel load ranges for major crops grown in Arkansas**

FIELD CROP	FUEL LOADING RANGE BASED ON CROP YIELD	AVAILABLE FUEL (tons/acre)
<b>Corn</b>	Low (121 bu/a)	3.1
	Medium (180 bu/a)	4.7
	Heavy (240 bu/a)	6.2
<b>Cotton</b>	Low (750 lbs/a)	0.8
	Medium (1121 lbs/a)	1.1
	Heavy (1491 lbs/a)	1.5
<b>Rice</b>	Low (109 bu/a)	2.5
	Medium (163 bu/a)	3.7
	Heavy (217 bu/a)	4.9
<b>Soybean</b>	Low (32 bu/a)	2.9
	Medium (48 bu/a)	4.3
	Heavy (64 bu/a)	5.7
<b>Wheat</b>	Low (38 bu/a)	0.9
	Medium (57 bu/a)	1.4
	Heavy (76 bu/a)	1.9

# VOLUNTARY SMOKE MANAGEMENT PROCEDURES

## Identify the nearest smoke-sensitive area

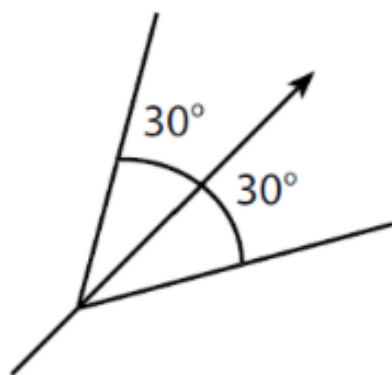
Try to keep smoke away from smoke-sensitive areas. Examples are large urban centers, airports, highways, communities, recreation areas, schools, hospitals, nursing homes, and Class I areas (areas set aside under the Clean Air Act to receive the most stringent protection from air quality degradation. Designated Class I areas in Arkansas are Caney Creek and Upper Buffalo Wilderness).

**The distance to smoke-sensitive areas ranges from 0 miles – more than 20 miles from the prescribed fire. Follow these five steps to identify smoke-sensitive areas:**

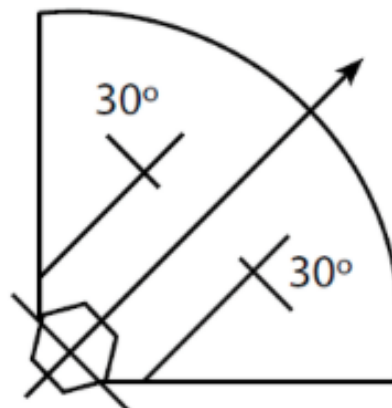
1. Locate on a map the prescribed fire and all potential smoke-sensitive areas, plus areas known to already have air pollution problems. The distance to smoke-sensitive areas ranges from 0 miles to less than 20 miles from the prescribed fire.
2. Determine the wind direction for the burn that will have the least impact on smoke-sensitive areas.
3. Draw a line representing the centerline of the smoke plume path using the wind direction chosen.
4. Determine the distance from the edge of the prescribed fire to the nearest smoke-sensitive area.
5. To allow for horizontal dispersion of the smoke, as well as shifts in wind direction, draw two other lines from the burn at an angle of 30 degrees from the centerline(s).

For a small burn (less than 1,999 acres), draw as in Figure 1.  
For a large burn (more than 2,000 acres), draw as in Figure 2.

**FIGURE 1: SMALL BURN**



**FIGURE 2: LARGE BURN**



# VOLUNTARY SMOKE MANAGEMENT PROCEDURES

## Determine Category Day

Category Day – a scale from 1 to 5 based on transport wind speed and mixing height. For smoke dispersal, 1 is poor and 5 is excellent.

Inversion – increase of temperature with height in the atmosphere.

This condition often exists in the morning and prevents smoke from rising into the atmosphere.

**The category day classification can be obtained from the Arkansas Department of Agriculture Dispatch Center or National Weather Service at <http://www.weather.gov/lzk/forest2.htm>.**

Table 2 (left) provides burning guidelines according to the Category Day classification.

### Table 2: Category Day Burning Guidelines

CATEGORY DAY	BURNING GUIDELINES
1	Daytime burning only, between 11 AM and 4 PM, maximum of 100 acres, and not before surface inversion has lifted. No burning of heavy fuel loads.
2	No burning until 11 AM and not before surface inversion has lifted. Burning should be substantially over by 4 PM.
3	Burn only after surface inversion has lifted.
4	Burn anytime.
5	“Unstable” and windy. Excellent smoke dispersal. Burn with caution.

# VOLUNTARY SMOKE MANAGEMENT PROCEDURES

## Determine Tons of Fuel Allocated to an Airshed

The fuel tonnage is figured using the Table 3. Arkansas Department of Agriculture dispatchers will notify the farmer if the tons exceed the allotment for the airshed on the day, based on conditions, and others who have reported crop burns and other prescribed fire activities that day.

Table 3 (right): The maximum tons of fuel that can be allocated to an airshed based upon the downwind distance to the nearest smoke-sensitive area and the category day.

*Example: If a smoke-sensitive area is located 1/4 (0.25) mile downwind, the maximum total available fuel loading allocated to the airshed for a Category 4 day would be 720 tons.*

**Table 3: Max Tons of Fuel Allocated to an Airshed**

DISTANCE TO SMOKE-SENSITIVE AREA (MILES)	CATEGORY DAY 2	CATEGORY DAY 3	CATEGORY DAY 4	CATEGORY DAY 5
<b>TONS OF FUEL</b>				
<b>0-0.19 (0-1,000 FT.)</b>	<b>RECOMMEND DO NOT BURN</b>			
<b>0.2-4.9</b>	<b>488</b>	<b>560</b>	<b>720</b>	<b>1,280</b>
<b>5-9.9</b>	<b>1,000</b>	<b>1,200</b>	<b>1,840</b>	<b>3,200</b>
<b>10-19.9</b>	<b>1,840</b>	<b>2,240</b>	<b>4,200</b>	<b>7,200</b>
<b>20 OR GREATER</b>	<b>2,880</b>	<b>3,280</b>	<b>6,400</b>	<b>11,600</b>



# BEFORE YOU BURN

## DO...



Complete Safe Burning Checklist before you burn.  
*See back page for checklist.*



Report your crop burn to the Arkansas Department of Agriculture Dispatch Center at 1-800-830-8015.

## DO NOT...

**DO NOT BURN** if winds exceed 15 mph.

**DO NOT BURN** if humidity is below 20%.

**DO NOT BURN** when the wind direction could send smoke directly into roadways or communities.

**DO NOT** leave your fire unattended.

**Voluntary Smoke Management Guidelines, Resources, and Additional Information Available at**

[agriculture.arkansas.gov](http://agriculture.arkansas.gov),  
or by using the QR code provided.



This document created with input from the smoke management task force and members from the following organizations:



FORESTRY DIVISION



# BEFORE YOU BURN: CALL 1-800-830-8015

The Arkansas Department of Agriculture (Department) Dispatch Center coordinates prescribed fire activities, reports fire weather, and assists with voluntary smoke management. Farmers should notify the Department Dispatch Center on the morning of the prescribed fire by calling 1-800-830-8015.

Farmers should complete a short checklist, as part of their crop management plan, before starting a prescribed fire.

**On the day of a planned prescribed fire, the farmer should provide the information below to the Department Dispatch Center. Farmers may call to report the information, or can complete an online form available at this link: [agriculture.arkansas.gov/arkansas-voluntary-smoke-management-guidelines/](http://agriculture.arkansas.gov/arkansas-voluntary-smoke-management-guidelines/)**

- Person in Charge of the Fire and Phone Number: \_\_\_\_\_
- Location of the Fire\* (\*using your smart phone: LAT/ LONG): \_\_\_\_\_
- Number of Acres to be Burned: \_\_\_\_\_
- Fuel Type (see page 3): \_\_\_\_\_
- Distance to Smoke Sensitive Area (see page 4): \_\_\_\_\_

The Department Dispatch Center will map each prescribed fire in the center of the airshed for purposes of complying with voluntary Smoke Management Guidelines. If the fuel tonnage for a single prescribed fire causes the fuel loading tonnage for a given airshed to exceed permissible limits, the Department Dispatch Center will recommend to the farmer that the plan should be altered (either by delaying the burn or reducing the acreage to be burned).

**Find all reported prescribed burns, Wildfire Danger, and active Burn Bans (declared by County Judges) listed at [www.arkfireinfo.org](http://www.arkfireinfo.org).**

**The fire weather forecast is available on the National Weather Service website at [www.weather.gov/lzk/forest2.htm](http://www.weather.gov/lzk/forest2.htm).**

## **BEFORE YOU BURN Complete a Safe Burning Checklist**

***Check (X) and burn ONLY if all items are addressed:***

- Take extra precautions for smoke sensitive areas and ensure they are not threatened (highways, residents, communities, etc.)
- Make official notifications to the Department Dispatch Center at 1-800-830-8015
- Check to be sure relative humidity is above 20%
- Check to make sure wind speed is less than 15 mph
- Be sure to follow appropriate Smoke Category Day guidelines (page 5)