Instructor Presentation Plan

Course: Florida's Certified Pile Burn Manager Program
Unit Number: 1
Presentation Title: Weather Factors
Presentation Time: 1.0 hour

Presentation Objectives:
Upon completion of this presentation, the participants will:

1. Describe weather factors that impact pile burning.
2. Describe impacts on smoke dispersion.

Presentation Outline	Aids and Cues
Title Slide **Presentation Objectives** Upon completion of this presentation, the participants will be able to: 1. Describe weather factors that may impact pile burning. 2. Describe weather impacts on smoke dispersion. **Introduction** The Division of Forestry issues 115,000 – 120,000 authorizations a year under its open burning program. Of these authorizations, a significant percentage is issued for pile burning. Pile burns also make up a large percentage of smoke complaints. Excessive smoke from pile burns may contribute to accidents on adjacent roadways and lead to lawsuits against the burners. The goal of this section is to help the burners understand the weather conditions that may contribute to adverse smoke conditions from pile burns and those that may lead to unsafe burning conditions.	01-01-CPBM-PPT

Presentation Outline	Aids and Cues
Development	01-01-CPBM-PPT
1. Factors affecting pile burns include:	
a. Wind b. Temperature c. Fuel Moisture d. Humidity e. Stability	
2. Wind is defined as the horizontal movement of air. Wind may be classified into GENERAL and LOCAL winds.	01-03-CPBM-PPT 01-04-CPBM-PPT
a. General Wind: Large-scale wind associated with high and low pressure systems in the atmosphere.	01-05-CPBM-PPT 01-06-CPBM-PPT
b. Local Wind: Small-scale winds due to local temperature or topographic differences. Some examples include sea breezes, thunderstorms, slope winds and whirlwinds.	01-07-CPBM-PPT 01-08-CPBM-PPT 01-09-CPBM-PPT
c. Effects of wind on fire: (1) Wind acts as a catalyst in preheating. (2) Wind may cause spotting if fire brands are carried away from the fire and ignite other areas. (3) Can affect the intensity of the fire by focusing or removing heat.	01-10-CPBM-PPT 01-11-CPBM-PPT 01-12-CPBM-PPT
d. Air Movement (transport, dilute or trap air pollution): Air is heated by flame, expands, becomes less dense, and then begins to rise like a cork in the water. Cool, dense air moves in to replace the warm air and is quickly heated and replaced by more cool, dense air, thus setting up a circulation continuing as long as the fire burns.	01-13-CPBM-PPT 01-14-CPBM-PPT
3. Temperature	01-15-CPBM-PPT
a. Rays of the sun striking directly upon fuels raise fuel temperature	

Presentation Outline	Aids and Cues
far in excess of air temperature, thus expelling moisture contained in fuels and less fire heat required to reach ignition point. b. Factors affecting surface temperature. (1) angle of the sun (2) length of day (3) clouds/shade (4) winds (5) type of surface being heated 4. Fuel moisture determines how well the pile will burn and the amount of smoke it will produce. Fuel moisture depends upon: (1) Precipitation (2) Humidity (3) Cloud/Shade (4) Wind (5) Type of fuel 5. Effect of moisture on fire (1) Prevents the fire from receiving sufficient oxygen. (2) Has a cooling effect – part of the heat from the fire chain reaction is required to evaporate moisture from the air near the fuel. (3) Absorbed by the fuel itself thus raising the ignition point. 6. Humidity: Relative humidity is the term that indicates how much moisture is in the air as compared to how much it can actually hold. (1) Minimum relative humidity typically occurs mid-afternoon with the maximum temperature and corresponds to the time of maximum fire danger. (2) Maximum relative humidity usually occurs at the time of the minimum temperature, near dawn. 7. Dispersion: The ability of the atmosphere to remove smoke from the air. Higher dispersion results in better visibility and fewer smoke problems. Lower dispersion results in smoke being trapped	01-16-CPBM-PPT 01-17-CPBM-PPT 01-18-CPBM-PPT 01-19-CPBM-PPT

Presentation Outline	Aids and Cues
near the ground and potentially on roadways. (1) Dispersion Index (DI): Ranges from 0 to over 100 with the ideal range for burning being 35-70. (2) The Low Visibility Occurrence Risk Index (LVORI): A combination of the dispersion index and relative humidity. Indicates the likelihood of smoke and or fog forming and contributing to highway accidents. Values range from 1-10 with 7-10 indicating the highest risk and 1-3 indicating lowest risk. 8. Vortices Knowing conditions that favor the formation of vortices is of high value to the pile burner. The lifting of embers by vortices can be one of the key spotting mechanisms. The presence of dust devils or fire whirls in the area of a pile burn indicates the atmosphere is unstable and the potential exists for spotting and control problems. 9. Weather Forecast Elements (1) Daytime maximum temperature (2) Morning and afternoon wind speed and direction. (3) Daytime minimum relative humidity (4) Precipitation chance (5) Dispersion index (DI) (6) Low Visibility Occurrence Risk Index (LVORI) (7) Mixing height (8) Transport wind speed 10. Sources of weather information (1) Division of Forestry duty officer (2) National Weather Service (3) NOAA Weather Radio (4) Television and radio (5) Daily newspaper	01-20-CPBM-PPT 01-21-CPBM-PPT 01-22-CPBM-PPT 01-23-CPBM-PPT 01-24-CPBM-PPT 01-25-CPBM-PPT 01-26-CPBM-PPT 01-27-CPBM-PPT 01-28-CPBM-PPT 01-29-CPBM-PPT 01-30-CPBM-PPT 01-31-CPBM-PPT 01-32-CPBM-PPT

Presentation Outline	Aids and Cues
(6) Internet	
11. Conditions under which burning is prohibited:	01-33-CPBM-PPT
(1) Air stagnation: The existence or forecast of a stagnant atmospheric condition as advised by a National Weather Service Advisory	
(2) Air Pollution Advisory (ozone): A statement issue by local air programs in the area through the media informing the public that an exceedence has been recorded. Issuance of an advisory is mandatory with any recorded exceedence. All burning will cease until further notice by the local agency(s) who initially issued the statement.	
(3) Fire Alert	
12. It is important to continue to monitor local weather conditions throughout the burning day.	
Review Objectives	
Upon completion of this presentation, the participants will:	
1. Describe weather factors that may impact pile burning. 2. Describe impacts on smoke dispersion.	
Questions	01-34-CPBM-PPT