Photo by Chase Brooke

Brush Pile Burning

RAY HINNANT

Let's start at the beginning

- You have pushed or hand cut brush and created a pile to burn
- The pile could be burned almost any day of the year
  - You might luck out
  - Or you might not!
- For sure you don't want to get the VFD or the TAMUFS involved
- Might create a bad name for burning
- Lawyers might get involved

Brush Pile Burning Standards of Care (or any application of fire)

- Cautious – Careful to avoid possible problems
- Competent – Taken training and have experience
- Prudent – Showing Care and thinking of the future

Same Standards of Care as a Prescribed Burn

- A written Burn Plan
- Adequate fire lines or firebreaks
- Adequate manpower
- Adequate fire fighting equipment
- Proper notifications

Brush Pile Burning Objectives

- Safety
- Near totally consumed on the burn day
- Minimal environmental impact

Brush Pile Size and Shape

- Recommended size is approximately the size of a car
  - Reduces the possibility of long-range spotting
  - Easily monitored
  - Easily lit and it reduces the impact for plant succession following the burn
  - Best to start small and add to it if possible.

Brush Pile Size and Shape

- Don’t burn more piles than you can monitor and extinguish with the personnel and equipment available
- Avoid windrows if possible
- Keep the piles as clean as you can
  - Wood is good, keep the soil out!

Clean or soil pushed?

Windrows of Brush can be difficult

Planning a Brush Pile Burn

- Allow a year or so for the brush to dry out.
  - Reduces smoke and improves ignition
- Begin planning how/when you'll burn as soon as the pile is built.

- A brush pile burning plan will assist you to meet your goals and objectives.

Plan

- Make your plan way ahead of the actual burn date.
- Follow your plan!

Plan

- What are you burning?
  - Size
  - Number of piles
  - Location of the pile
    - Close to buildings, roads, or sensitive receptors?
  - Describe the pile
    - General description

Plan In Advance

- When would you like to burn?
  - Time of year
    - May and June are usually the best months
    - Residual forage from the previous year has been removed with rain.
    - Mostly actively growing green grass with a high moisture content.
  - Time of day
    - As early as possible will help reduce the risk

Plan in Advance

- Fire lines and or fire breaks
  - Disk/Blade around the pile
  - Mow and blow around the pile
  - Graze the pasture heavily

Plan

- Weather conditions for the day of the burn
  - Expected Relative Humidity
    - Data has shown that RH greater than 40% reduces the likelihood of an ember starting a fire downwind.
    - Greater than 55% will provide a much safer burn
  - RH can fluctuate and drop rapidly causing 'safe' piles to suddenly start spotting downwind

Plan

- Wind direction
  - Avoid smoke blowing across roads or towards sensitive structures or hazard areas.
- Ventilation Rate
  - Mixing height x transport wind speed
  - Good ventilation rate will cause ideal smoke dispersal

Plan

- Wind direction
  - Avoid smoke blowing across roads or towards sensitive structures or hazard areas.

Plan

- Weather conditions after the burn
  - Large logs or logs covered in dirt can burn for many days
  - High wind can blow the ash off and embers carried a long distance
  - Even if near 100% of the pile burned, there may still be active embers
  - You own the burn until it is completely out

Plan

- How much help will you need onsite?
  - Different for each burn and as the burn boss you will need to determine this before the match is lit!
  - How many brush piles will you burn and how far apart are they?
  - Are helpers trained in using the suppression equipment and
  - Trained to watch for problems?

Plan

- Personal protection
  - All cotton clothes or Nomex
- Ignition equipment
  - Drip torch
  - Pear burner – not as affective
  - Other
- Suppression equipment
  - Water sprayer
  - Hand tools
  - Phone and hand held radios

Plan

- Contacts
  - Vary by County – Dispatch, Emergency Mgt.???
  - Neighbors
  - Utilities
- Note the time you notify someone and their name

Plan

- Lighting procedure
  - Against the wind
    - Fire backs into the pile
    - Reduces Intensity

  - With the wind
    - More intensity
      - Reduce intensity with a little water
    - More smoke usually
    - More ember risk

Plan

- Contingency Plan
  - Plan what you will do and when in case the fire escapes
  - A little thought here will reduce a lot of anxiety and save a lot of time/land if things go wrong

Plan

- Now, execute your plan!

Rehabilitation following the burn

Be Patient

- Secondary succession
- Scatter a few grass/forb seeds
- May take a year or two or longer.

Fuels and Fuel Moisture

- An understanding of fuels and fuel moisture will help set your goals and objectives
- Time Lag fuels – **Dead fuel**
  - 1hr <1/4”
  - 10 hr ¼ - 1”
  - 100 hr 1 – 3”
  - 1000 hr 3 – 8”

Fuels and Fuel Moisture

- Dead fuels respond to RH and not to Soil Moisture
- As temperature increases, RH declines during the day it takes a 1 hr fuel about an hour to equilibrate with RH decline.
- As RH declines, the fuel moisture also declines.
- As fuel moisture in the 1 hr fuels decline the more susceptible to a hot ember starting the plant on fire which could causing a wildfire unless quickly extinguished.

- Burning Brush Piles during periods with High KBDI and predominantly dried vegetation is a disaster waiting to happen,

Moisture of Extinction

- The fuel moisture content of dried 1hr fuels at which combustion will not be sustained independently.
- Moisture of Extinction can be used to decide what RH percentage you want to choose for your burn plan.

Moisture of extinction

Example:

- Timber and grasses
  - Moisture of extinction =15%
- Quick estimate of fuel moisture
  - Divide RH by 5
- RH 80/5 = 16% fuel moisture
- RH 40/5 = 8% fuel moisture
- Doesn't preclude burning at that RH but should give you an idea of fire behavior if embers are blowing into dried grass

Chance of Ignition by an ember

- Another table that will help you determine the RH that you would like to have during a brush pile burn.

R.H. (%)	1-HR. F.M. %	10-HR. F.M. %	Relative ease of chance ignition and spotting, general burning conditions.
>60	>20	>15	Very little ignition; some spotting may occur with winds above 9 mi./h.
45-60	15-19	12-15	Low ignition hazard—campfires become dangerous; glowing brands cause ignition when relative humidity is <50 percent.
30-45	11-14	10-12	Medium ignitability— matches become dangerous; "easy" burning conditions.
26-40	8-10	8-9	High ignition hazard—matches always dangerous; occasional crowning, spotting caused by gusty winds; "moderate" burning conditions
15-30	5-7	5-7	Quick ignition, rapid buildup, extensive crowning; any increase in

Safety

- A very safe Brush Pile Burning example.
- Clean pile, no soil
- Very short very green grass
- Burned with higher RH

Burning alternatives

- Scatter the brush across the pasture.
  - Provides a barrier for herbivores which allow better grasses to grow and provide seed.
  - Could be burned with a prescribed pasture burn
  - Could be left in the pasture for many years
- Mulch the pile
- Leave the brush pile
  - Provides a habitat for wildlife
  - No soil disturbance

Conclusion

- Apply Standards of Care,
- Make a plan and follow it.
- Burn under the safest of conditions.
- Provide a good example for your neighbors and your county officials.
- Join a Prescribed Burn Association to learn even more.

- Happiness is Smoke on the Horizon!