BURNING UNDER P. pinaster

by

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In undertaking a controlled burning operation under P. pinaster, it is recommended that the following procedures should be observed:—

Check out the written prescription and ascertain the fire danger rating required together with any other conditions stipulated for the burn.

Because fuel moisture is a major controlling factor of burning under pine canopy, it is of utmost importance that all variables dealing with this aspect are identified.

In compiling the prescription all known factors should be considered, and therefore the prescription should contain such information as:

Year of planting to indicate the stage to which heavy plated bark exists on the lower bole of the tree, and if not previously burnt, the percentage of red needles likely to make up the fuel bed. (This percentage appears to be highest in the 13 to 18 year group.)

Trees per acre. Wind velocity in the forest varies considerably with stocking. Therefore this information is important in assessing the windbreak effect at ground level within the stand.

Co-dominant height and green crown level. The type of stand to be burnt described by these figures will indicate what fire intensity can be tolerated without crown scorch.

Pruning and thinning will provide information on fuel quantity, type and distribution, as well as the effects on wind velocity and drying rates. In unpruned stands some "torching" of trees could be expected.

Fuel. It should be known whether the fuel bed consists of needlebed only, needlebed with new slash or needlebed with old slash.

A fuelbed of needles only, is by far the simplest fuel to handle, being more even in distribution and compaction, thus giving a reasonably even "available fuel" quantity and will therefore give a consistent quality burn.

The age of the fuel is important to predicting fire behaviour.. The red (new) needles normally burn during periods of high relative humidity, whereas the grey (old) needles, having weathered and lost some of their "water proofing" properties, quickly absorb moisture and become unavailable for burning.

Slope, elevation and aspect. Slopes with a southerly aspect dry more slowly than similar areas with northerly or westerly aspects, due to effects of solar radiation.

During the winter burning season, drainage of soil moisture from elevated areas, such as the dune or hill top will exhibit greater fuel drying potential than more low lying areas.

Soil Type. Moisture retentative properties of various soils affects fuel drying rates. Personal experience suggests that gravel dries first, followed by sand, loam, and clay.

Crown Density. Low crown density will increase fuel drying rates by reason of reduced shading effects and more wind movement. This together with openings in the crown cover, will tend to increase vertical development of any burning, often creating a "chimney effect" around such openings.

Scrub (quantity, type and species). The presence of certain scrub types will often indicate the likely flame fronts produced from flaring of flammable species, as well as providing aeration of pine and other fuels suspended above the surface.

Location and perimeter of areas. The location of the area to be burnt in relation to the remainder of the plantation, can often suggest increased drying of the fuel in the area, particularly on the coastal plains where western edges are relatively exposed to high wind velocities from the westerly winds of the winter low pressure systems.

Almost all perimeters show greater fuel drying rates than internal areas, usually in the order of western, northern, eastern and southern edges.

By the means of field checks ascertain whether sufficient past rain has saturated the fuel bed. Then having checked the prescription for burning, calculate the day's predicted fire danger index, using the Fire Danger Tables. Remember that unlike hardwood forests, drying can take place in pine fuel on days below 60° temperature.

Weather readings should be taken at a nearby local recording point or in the field at the site of the burn.

If the above conditions check out, the next step is to light a "test fire," selecting a point where fuel drying rate is likely to be at a maximum for the area.

Observe the fire behaviour of the test fire for sufficient time to allow fire development to stabilise and if the result confirms the predicted fire danger range, calculate a grid lighting pattern to give a 2 hour close (as per pine burning instructions). This would normally give strip distances of up to 3 chains.

On the initial lighting, spot distances should be doubled to allow an observation to be made of the fire behaviour intensity increase, due to the multiple fire effect.

Remember that further fire can easily be added if performance is below expectation. In this way greater control is exercised.

When selecting a lighting pattern for a 2 hour close other than in minimum conditions, where line of fire and close spots are used, the ideal result is to produce an elongated fire shape with spots spaced far enough apart whereby the head fire has travelled sufficiently deep to remove its influence on a flank fire close.

In conditions where junction zones occur between the headfire, flank fires and tail fire a very marked increase in fire intensity can be produced usually resulting in a hot burn.

During the burning, weather readings should be taken and fire danger ratings calculated at not more than two hourly intervals, remembering that fire behaviour can vary sharply over short periods due to changes in fuel moisture content and weather.