



## Input Methods Lesson

### Exercise Answers

Develop a new Worksheet that looks like the following one and answer the questions below.

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Inputs: SCORCH, MORTALITY

Description

Fuel/Vegetation, Overstory

Canopy Height ft

Crown Ratio fraction

Mortality Tree Species

D.B.H. in

Weather

Midflame Wind Speed (upslope) mi/h

Air Temperature oF

Fire

Surface Fire Flame Length ft

Run Option Notes

None

Output Variables

Scorch Height (ft) [SCORCH]

Probability of Mortality (%) [MORTALITY]

- Open a new **BasicStart.bpw** Worksheet. You may want to close any other Worksheets that are open.
- In the **Module Selection** window, deselect SURFACE.
- Select SCORCH and MORTALITY.
- Click **Ok**. (None of the defaults were changed in the Worksheet.)

#### 1. What is the valid input range for Canopy Height?

The valid input range is 0 – 300 ft, which is found by clicking the **Guide** button next to **Canopy Height**.

(0 - 300 ft)

From

Thru

Step

## 2. Which other modules use the Canopy Height variable?

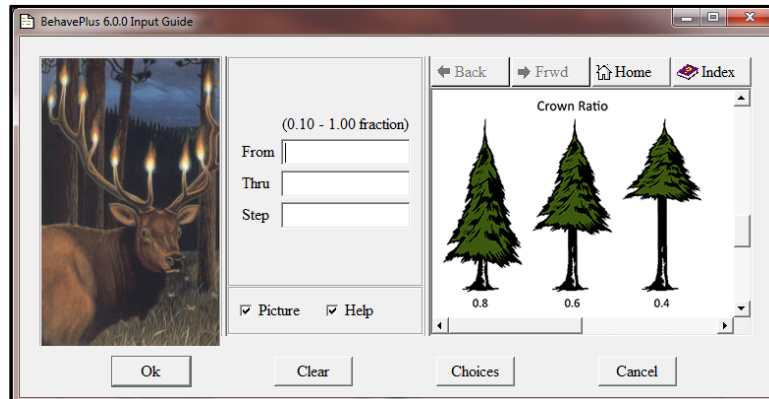
- Click on the **Guide** button associated with **Canopy Height** and view the help file.

The table shows the modules in which Canopy Height is used. In addition to the MORTALITY module, Canopy Height is an input to SURFACE, CROWN, and SPOT.



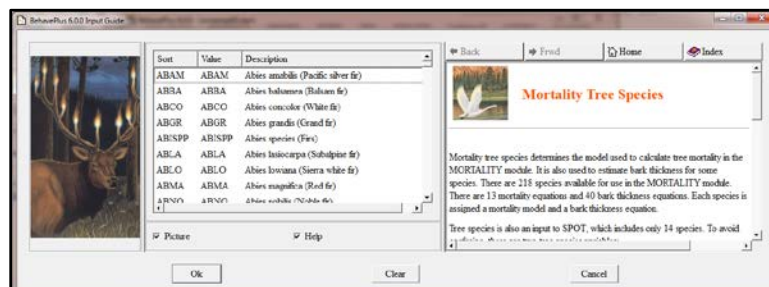
## 3. Is there a diagram that helps you visualize Crown Ratio?

- Yes, click on the **Guide** button next to **Crown Ratio**.
- Scroll down in the help file until you see the image shown below.



## 4. How many Mortality Tree Species are available to choose from?

According to the Help file, there are 218 species available for use in the MORTALITY module. The list of species is available as a discrete variable list that you can select from.



## 5. What is Mortality Tree Species used for?


A description of the variable is in the Help file. Mortality Tree Species is used to determine which model will be used to calculate tree mortality. It is also used to estimate bark thickness for some species. More information about the models used to calculate tree mortality is available as a link further down in the file.

The tree species available to the MORTALITY module are listed in

- [Tree Species Bark Thickness & Mortality Equations](#).

## 6. Which module uses Air Temperature – SCORCH or MORTALITY?

The SCORCH module uses Air Temperature to calculate Scorch Height. It is also an input to the IGNITE module to calculate the probability of ignition from a firebrand. It is not, however, an input to the SURFACE module. Air Temperature is an important input to dead fuel moisture, but since the SURFACE module requests dead fuel moisture values directly, it does not require Air Temperature.

 <b>Air Temperature</b>			
<p>Air temperature is the ambient dry bulb temperature measured in the shade. Remote automated weather stations typically measure air temperature at 4 to 8 feet (1.2 to 2.4 m). It is used to calculate scorch height and probability of ignition from a firebrand. Note that while air temperature may be used to estimate 1-h fuel moisture, such as with the Fine dead fuel moisture tool, it is <i>not</i> included in the surface fire rate of spread and surface fireline intensity calculations.</p>			
I/O	Module	If	Notes
Input	SCORCH		
	IGNITE	If Probability of ignition from a firebrand is calculated.	
Output	None		

## 7. How can you calculate Surface Fire Flame Length rather than entering it as an input?

Surface Fire Flame Length can be calculated in the SURFACE module. If you select the SURFACE module in addition to SCORCH, the flame length value will be calculated.

I/O	Module	If	Notes
Input	CROWN	If SURFACE is not selected and if both <i>Crown fire is calculated using Rothermel (1991)</i> and <i>Surface fire intensity is entered as flame length</i> are selected as input options.	If SURFACE and CROWN are both selected, the flame length in the direction of fire spread is calculated in SURFACE and used by CROWN.
	SCORCH	If SURFACE is not selected and if <i>Fire intensity is entered as flame length</i> is selected as an input option.	If SURFACE and SCORCH are both selected, the flame length in the direction of fire spread is calculated in SURFACE and used by SCORCH.
	SPOT	If SURFACE is not selected and spotting distance from a wind-driven surface fire is selected as an output variable.	If SURFACE and SPOT are both selected, the flame length must be for the head fire, in the direction of maximum spread.
Output	SURFACE		