

## **Exercise Answers**

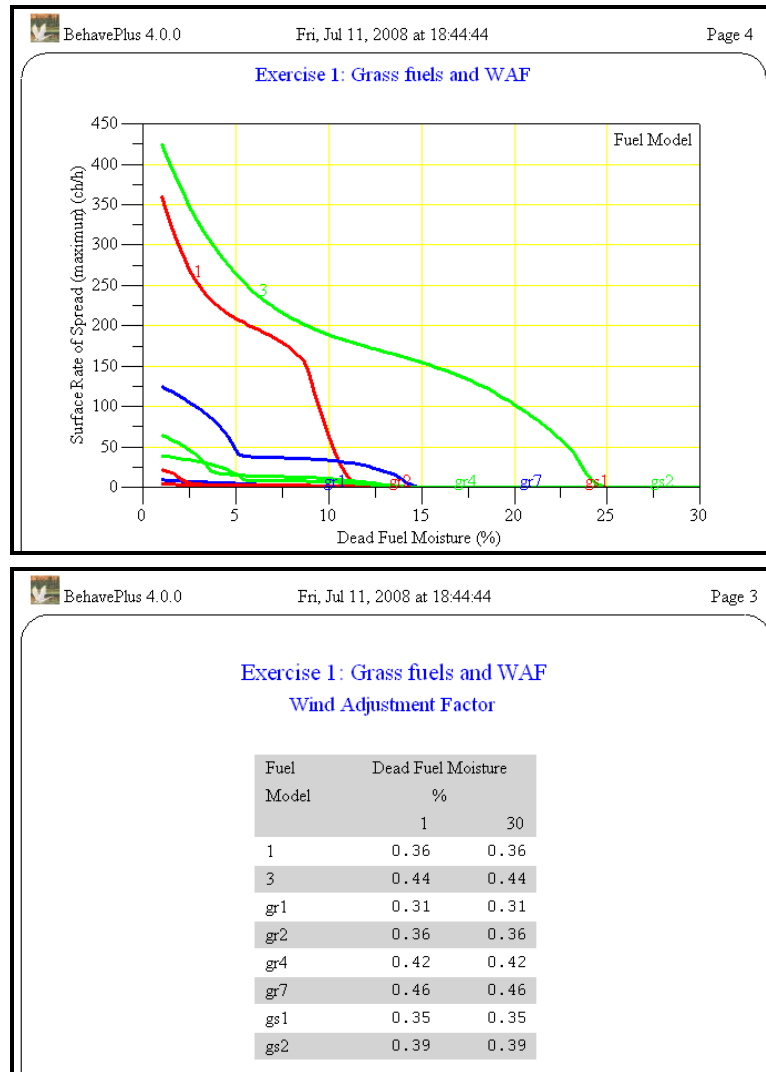
1. **Compare Surface Rate of Spread for the dry climate Grass and Grass-Shrub Fuel Models with no overstory using a range of 1-h Moisture and a 20-ft Wind Speed with a calculated Wind Adjustment Factor.**

Look at the grass Fuel Models 1 and 3 from the original 13 and the dry grass (GR1, GR2, GR4 ,GR7) and grass-shrub (GS1, GS2) Fuel models from the 40. Assume flat ground.

- Open **SurfaceSimple.bpw**.
- Open **Configure > Module selection > SURFACE Options... > Basic Outputs**. Change the outputs to only Surface Rate of Spread and Wind Adjustment Factor.
- Open the Wind Speed tab. Change **Wind speed is entered as** to **20-ft wind and Calculated wind adj factor**.
- Click **Ok** twice.
- Modify the Worksheet to look like the following.

- Calculate the Run.

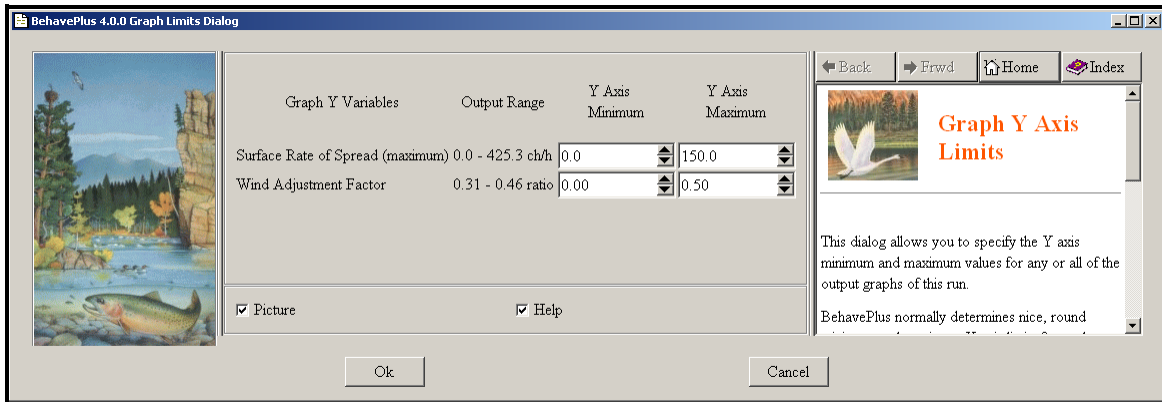
A plot provides a visual comparison of the Surface Rate of Spread. A table allows you to examine the Wind Adjustment Factors.



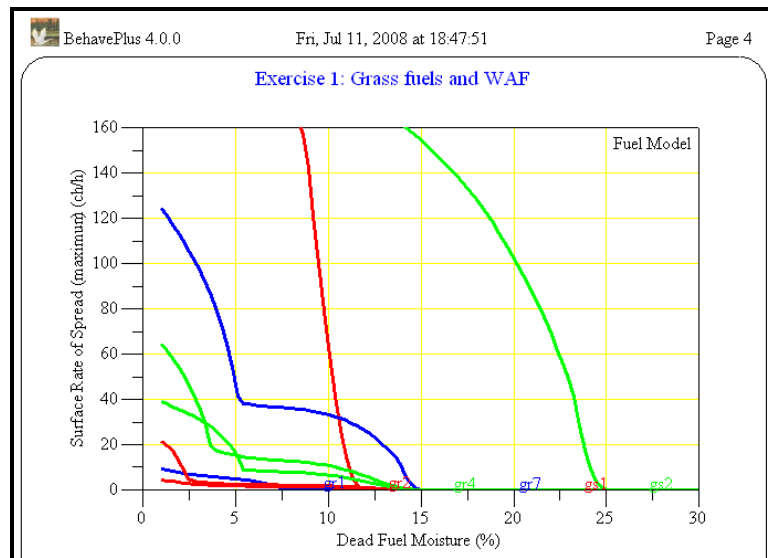
A higher WAF leads to a higher Midflame Wind speed for the same 20-ft wind. The difference in the Surface Rate of Spread is due to both the Fuel Model and the Midflame Wind Speed.

Do another calculation with the maximum Surface Rate of Spread set to 150 ch/h to better compare the GR and GS Fuel Models.

- Calculate the Run.
- Click on **Specify graph Y axis limits**, setting the **Surface Rate of Spread Y Axis Maximum** to 150 ch/h.



- Click **Ok**.



## 2. Compare Surface Rate of Spread for Fuel Model TU3 the fire behavior for a range of 1-h Moisture and a range of Canopy Cover.

- Open a new **SurfaceSimple.bpw**.
- Open **Configure > Module selection > SURFACE Options... > Basic Outputs**. Change the outputs to only Surface Rate of Spread and Wind Adjustment Factor.
- Open the Wind Speed tab. Change **Wind speed is entered as to 20-ft wind and Calculated wind adj factor**.
- Click **Ok** twice.
- Modify the Worksheet to look like the following.

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**Inputs: SURFACE**

Description Exercise 2: Effect of Canopy Cover

**Fuel/Vegetation, Surface/Understory**

Fuel Model tu3

**Fuel/Vegetation, Overstory**

Canopy Cover % 10, 20, 30, 40, 50, 60, 70

Canopy Height ft 60

Crown Ratio fraction 0.5

**Fuel Moisture**

Dead Fuel Moisture % 1, 4, 7, 10, 13, 16, 19, 22, 25

Live Fuel Moisture % 100

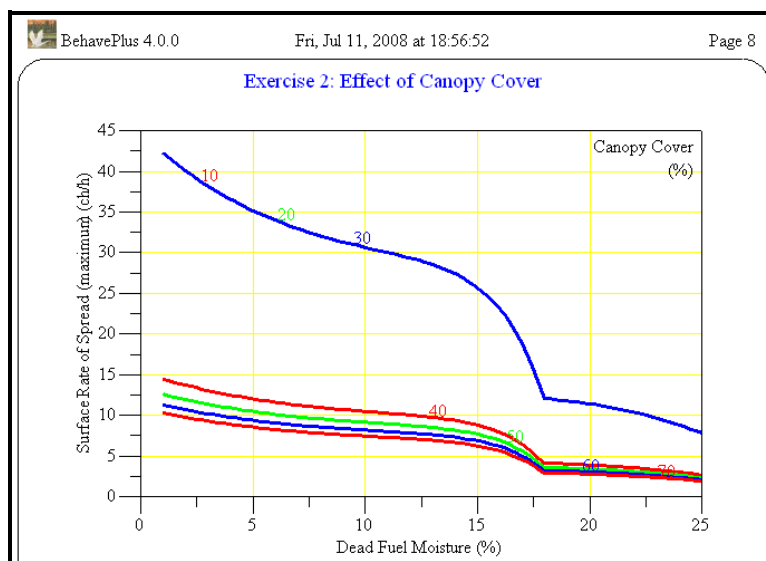
**Weather**

20-ft Wind Speed (upslope) m/h 20

**Terrain**

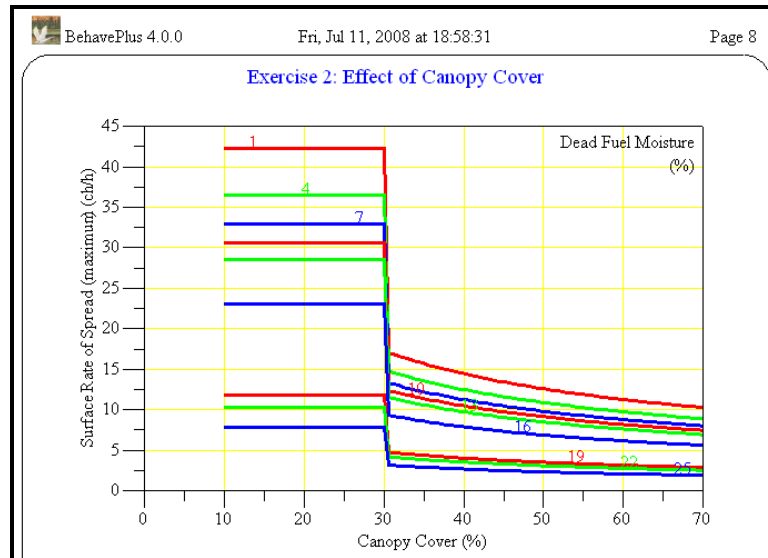
Slope Steepness % 0

- Calculate the Run.
- Change **Select the X-Axis Variable** to **Dead Fuel Moisture**.



Notice the big space between 30 and 40% Canopy Cover.

- Do another calculation with the **Select the X-Axis Variable** set to **Canopy Cover**.



This plot shows the transition between Sheltered and Unsheltered WAF at about 30% Canopy Cover.