Probability of Ignition of Mountain Pine Beetle Affected trees

Mountain pine beetle attacks across the Northern Rockies have killed large tracts of lodgepole pine and ponderosa pines. After the attack the needles of these trees can rapidly loose moisture creating conditions where fires can quickly transition from surface to crown fire behavior. Probability of ignition in these affected stands can be very different than predicted by the Probability of Ignition tables found in the Incident Response Pocket Guide (IRPG). Scientists and technicians at the Missoula Fire Lab have developed a Probability of Ignition table based on field and laboratory analysis of both green attacked and red needled pines. Findings show that trees that have been attacked and killed by the beetle have a higher probability of ignition than indicated in the IRPG table.

Embers falling into the crowns of beetle attacked and killed trees or the needle litter below these trees, have a high probability of independent ignition with no additional heat source. Transition in these stands from surface to active crown fire can be extremely rapid with little change of weather and atmospheric conditions.

The table below should be used when engaging fires in beetle attacked trees. To find the probability of ignition follow the instructions found in the IRPG on pages 83 – 85. Determine the Reference Fuel Moisture (RFM) % and apply the appropriate adjustment factors to determine the Dead Fuel Moisture of pine needles at the fire location. Add the resulting Dead Fuel Moisture Content Correction (%) to the Reference Fuel Moisture (%), this is your Fuel Moisture (%). Apply this number to the MPB Attacked Tree Table to determine the Probability of Ignition for affected trees.

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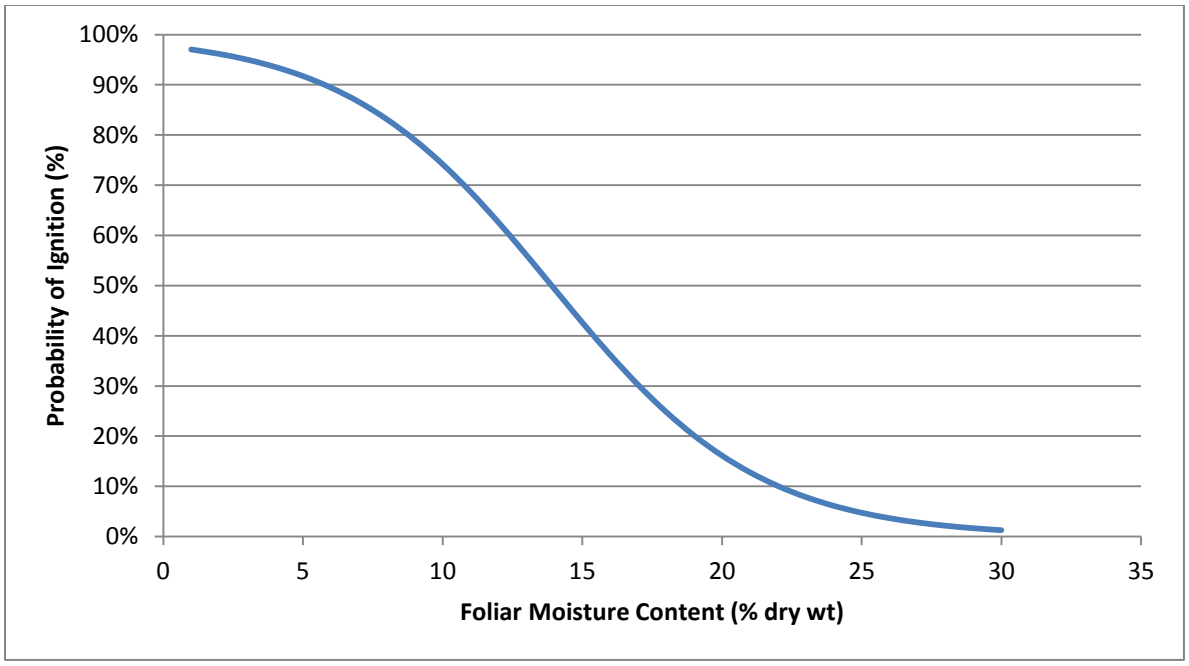
Figure 1 Mountain Pine Beetle Attacked Trees, POI Table

Fuel Moisture (%)	*Probability of Ignition (%)*
1	97%
2	96%
3	95%
4	94%
5	92%
6	89%
7	87%
8	83%
9	79%
10	74%
11	69%
12	63%
13	56%
14	49%
15	43%
16	36%
17	30%
18	25%
19	20%
20	16%
21	13%
22	10%
23	8%
24	6%
25	5%
26	4%
27	3%
28	2%
29	2%
30	1%