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| 2016 Initial Needle Litter |
|   | **Healthy Spruce** | **Impacted Spruce** | **Lodgepole** |
| Ether Linkages (1150 cm-1) | 50 (±2) | 50 (±2) | 64 (±2) |
| Aromatics (1510 cm-1) | 33 (±1) | 30 (±2) | 19 (±1) |
| Amides (1600 cm-1) | 193 (±4) | 182 (±3) | 180 (±6) |
| Carbonyl (1720 cm-1) | 38 (±1) | 44 (±1) | 72 (±6) |
| Cellulose:Lignin | 1 (±0) | 2 (±0) | 3 (±0) |
|  |  |  |  |  |  |  |
| 2018 Decomposed Needle Litter |
|   | **Healthy Spruce** | **Impacted Spruce** | **Lodgepole** |
| Ether Linkages (1150 cm-1) | 43 (±11) | 58 (±11) | 76 (±6) |
| Aromatics (1510 cm-1) | 16 (±14) | 21 (±2) | 13 (±3) |
| Amides (1600 cm-1) | 171 (±67) | 193 (±6) | 143 (±4) |
| Carbonyl (1720 cm-1) | 23 (±15) | 40 (±6) | 84 (±9) |
| Cellulose:Lignin | 4 (±3) | 3 (±1) | 6 (±1) |
|  |  |  |  |

Results are based on an air-dried basis.

Averages plus or minus standard deviation in parenthesis (n=3).