

Mulching vs Chipping: A Brief Overview



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What are they?

Chipping is considered a type of mulching. However, in common language, mulching is often actually referring to “mastication” which produces debris most people associate with “mulch”. Mulching (by either mastication or chipping) is a method to redistribute vertically situated fire fuel (flammable vegetative material, such as trees) to the forest floor. This method is generally understood to achieve more favorable potential fire behavior by reducing vertical fuel continuity, crown fire potential, and fire intensity.

How are they produced?

Masticators and chippers are similar in that they both grind woody material into debris. Both types of equipment are available in a variety of shapes and sizes and depend on the respective forest treatment goals. Masticators are tools that are often attached to heavy machinery like excavators, dozers, and loaders. These machines move through the forest to grind vegetation and produce masticated debris (often referred to as “mulch”) that is then deposited right back onto the forest floor. Alternatively, chippers are most often on wheels, hauled behind trucks, and not as mobile through the forest. Chipped debris is usually sprayed out through a chute and distributed across the forest floor. Due to the operator’s ability to control where to spray, the chipped debris is able to be distributed more evenly and may also be collected and removed from the forest, unlike masticated debris.

What are the differences?

Variable	Chipping	Mastication
<i>Mulch Size</i>	Uniform woodchips	Variable (from small shreds to whole trunks/branches)
<i>Control over depth and distribution</i>	High	Low
<i>Operability on difficult terrain</i>	Low (difficult)	High (less difficult)
<i>Work rate</i>	Slower	Faster
<i>Cost</i>	Generally higher, labor intensive	Generally lower, higher equipment cost but lower labor costs
<i>Physical soil disturbance</i>	Minimal	Moderate to high
<i>Removal opportunities</i>	Can be removed off site	Cannot be removed
<i>Fuelbed compaction</i>	Very compact (due to small uniform size)	More compact than natural fuelbed, but less compact than chipping
<i>Water retention</i>	Lower	Higher
<i>Texture</i>	Softer	Tougher
<i>Residential uses</i>	Best for perennials, shrubs, and trees	More ideal for gardening
<i>Material mulched</i>	Smaller wood diameter	More variety of vegetation

What are the ecological and fire impacts?

Both masticating and chipping reduce plant density which can decrease fire risk and increase light, water, and nutrients available to plants. Depth and distribution of debris can suppress plant growth and establishment, but depths that are regularly applied are *rarely enough* to inhibit growth. As a general rule, depths exceeding 3 inches can limit herbaceous plant establishment while depths that exceed 6 inches fully suppress understory plant growth. Importantly, depth can vary significantly within the same site and it is generally recommended to focus on overall distribution of debris rather than average depth. Approximately 50% of the mulch applied decomposes within the first 10 years, providing beneficial nutrients and conditions for the soil.

Mulching (both masticating and chipping) can reduce forest density, the potential for crown fire, and fire intensity. It can also retain more moisture, resulting in ecological benefits and decreased ignition under less extreme fire conditions. In moderate fire conditions, mulch can burn as ecologically favorable low-intensity fires. However, in severe fire conditions, it can burn longer and produce more heat than other surface level types. Of course, this can complicate suppression efforts.

Which is better?

Ultimately, the decision to choose between chipping and masticating (and what to do with the debris) will depend on available equipment and desired outcomes of forest treatments.

Resources

- *Mulching: A Knowledge Summary and Implementation Guidelines*
Colorado Forest Restoration Institute, Southern Rockies Fire Science Network, and Front Range Roundtable
<https://cfri.colostate.edu/wp-content/uploads/sites/22/2020/02/FRRT-Mulching-Knowledge-Summary-and-Implementation-Guidelines-1.16.20.pdf>
- *Fuels Treatment*
Southern Rockies Fire Science Network
<https://www.southernrockiesfirescience.org/activity-fuels/>
- *Mulching the Forest Good/Bad, Colorado Wildland Fire Conference Talk by Brett Wolk*
<https://www.youtube.com/watch?v=Mmcq-9vd7yI>



Wood chipper



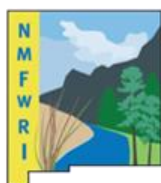
Woodchips



Masticator attachment



Masticated debris



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