Society Science

Woodchips on Arable Land Suppress Weeds

Hedgerows are cut down periodically to maintain their function and ecological value. On agricultural land, the chopped woody material is usually left on-site without any use. Mulch with these woodchips for weed control on arable land may be a useful alternative that additionally helps preserve traditional and beneficial landscape structures.

In an upcoming issue of Agronomy Journal, researchers report on a 16-year field trial with woodchip mulching in a typical crop rotation (cereal-based, grain legume and fodder included) on an organic farm in Southwest Germany. Effects of three rates of woodchip mulching (0, 80, and 160 m³ ha⁻¹) on weeds and crop yield were evaluated.

Woodchip mulching reduced the weed density by 9% compared with the control. The high mulching rate showed stronger effects than the low mulching rate. There was no significant effect on grain yields of crops, but the relative yield of all crops showed a decreasing trend over time.

The authors attribute the observed effects mainly to allelopathic leachates of the woodchips though other effects of woodchips may also be involved, such as acting as a physical barrier for germination, reduced soil temperatures, and lower nitrogen availability by a high C/N ratio of the woodchips.


Winter wheat (Triticum aestivum L.) mulched with woodchips in spring 2014, southwest Germany.

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Residual Nitrogen Carries Over in Dryland, Semi-arid Cropping Systems

It has long been recognized that inorganic nitrogen soil testing and estimates of mineralization from soil and plant organic matter are key to predicting fertilizer responses in semi-arid cropping systems. This carryover of nitrogen challenges our assumptions about crop nitrogen use efficiency from one season to the next.

In the November–December 2017 issue of Agronomy Journal, researchers report on a multi-year study in the inland Pacific Northwest featuring an emerging rotation of spring canola–spring pea–winter wheat. The researchers measured yields, nitrogen uptake, and mineralization in subsequent seasons following spring canola that received low to high fertilization as well as winter wheat following pea.

The researchers attributed higher yields and nitrogen uptake of subsequent crops to elevated residual inorganic nitrogen in the rooting zone following canola that had been excessively fertilized and when pea preceded winter wheat. The recovery of the residual inorganic nitrogen was improved in semi-arid systems with more water availability.

This study emphasizes the importance of having a multi-year perspective in nitrogen balances in semi-arid systems. From this perspective, the researchers presented an approach for assessing and comparing rotational nitrogen use across a range of water-limited environments utilizing relationships among yield potential and soil and plant N processes.


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