Packing summer fallow in the Pacific Northwest:  
Seed zone water retention  

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ABSTRACT: Seed zone water loss from summer-fallowed soils appears to accelerate in August and September in the Pacific Northwest (PNW) during the annual shift in the direction of coupled heat and water flows. A 2-year study was conducted to determine whether packing the surface of a stubble mulch and bare soil (moldboard plow) fallow with a roller in mid-August would benefit seed zone water retention at the time of planting in mid-September. Packing increased surface soil bulk density, resulting in increased soil volumetric water content to a depth of 0.1 m. However, at the time of planting 34 days after the packing operation, there were no differences in seed zone water content between packed and non-packed plots. Wheat seedling emergence was not significantly affected by packing. The stubble mulch, in addition to providing protection from wind erosion, was slightly more efficient than the bare soil mulch in conserving seed zone water. In this study there were no benefits of packing summer fallow >1 month before planting wheat. Therefore this practice is not recommended, especially on soils already vulnerable to wind erosion.