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Extension Extra

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Agriculture and
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COLLEGE OF AGRICULTURE & BIOLOGICAL SCIENCES / SOUTH DAKOTA STATE UNIVERSITY / USDA

TILL FOR A REASON

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When tilling a field there should be a reason for the tillage, whether it's to kill the weeds, breakup a compaction layer, prepare a seedbed, or in an emergency, stop erosion. Regardless of the reason, every tillage operation is going to remove some surface plant residue and expose the soil for some loss of moisture.

In a dry year, particularly, as much residue should be left on the surface as possible. This protects the soil surface from erosion and also catches more snow in the winter which in-turn provides good moisture for starting the crop in the spring. As much soil moisture as possible should be retained for next years crop.

Therefore, before pulling a tillage implement into the field, evaluate the situation. If there aren't any weeds to kill, if there is not a compaction layer to breakup and if not preparing the seedbed, then it is better to leave the tillage implement in the shed. It will save the cost of the tillage operation, it will help conserve soil moisture and it will leave the residue on the soil surface to protect it from erosion.

If it is necessary to fill, then fill at the depth and speed that is necessary for the particular situation. Till deep to correct for compaction, but to control weeds, fill only deep enough for kill. Weeds can usually be controlled by tilling at about a 4" depth.

Also, select the right tillage implement for the purpose. A sub-soiler may be necessary to breakup a compaction layer, but for shallow compaction, a chisel plow will accomplish the purpose. The chisel, or field cultivator is also good for weed and emergency erosion control. The disk is good in heavy residue and also for seedbed preparation.

Determining whether you have a compaction problem or just dry soil can decide whether you need to till or not. A University of Nebraska study found that less than 25% of the soils are com-

pacted and only about 10% of these acres are compacted to the extent of being yield limiting.

During a drought the plant roots need to go deeper to obtain moisture and a compaction layer can limit this action. Unless the plants can follow the cracks in the soil caused by drying, the plant will suffer from lack of moisture and nutrients.

The plant can be used as an indicator to tell if there is a problem due to field compaction. If some plants have coloration and height differences and there is a definite pattern to the weaker plants, then further investigation is necessary. Make sure this indication is not caused by wheel track patterns.

Further investigation can be conducted by digging into the soil. When digging, look for a hard layer of soil and whether or not the plant roots have penetrated that hard layer. Hard soil may only indicate a dry soil, whereas, a hard soil that the roots cannot penetrate indicates a compacted layer. If the roots have penetrated the hard layer, then it may not be necessary to worry about compaction.

If compaction is a problem, then the soil needs some deep tillage. This should take place when the soil is dry. A compacted soil should be filled to a depth equal to 1 1/2 times the compaction layer. This means a compacted layer that goes down 6" should be tilled to a 9" depth. Quite often a chisel plow will go deep enough to break up the compaction layer, but if the layer is too deep for the chisel, then a sub-soiler may be necessary. Either of these tillage implements will leave most of the residue on the surface which will help prevent erosion.

The main thing to remember is, make sure there is compaction before tilling to correct it. Tillage is an expensive operation costing \$10 or more per acre per tillage trip.



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