

TILLAGE & MULCHING FOR DRYLAND SOILS

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Clean Tillage methods

Primary Tillage

Primarily carried out to prepare smooth seed bed

Secondary tillage

Operations during the cropping period to reduce weeds & to increase water intake

Deep tillage

Ploughing soil up to 25 -30cm depth

Shallow tillage

Ploughing soil up to 25 -30cm depth



Conservation Tillage

Tillage system that leaves at least 30% of the soil surface covered with crop residues after the crop is planted



Stubble mulch Tillage

Tillage system that accomplished with implements that undercut the soil surface, thereby retaining most crop residues on the surface



Disk tillage

Tillage system that is carried out with the help of a disk to bury 30 to 70% of surface residues. It provides good weed control.

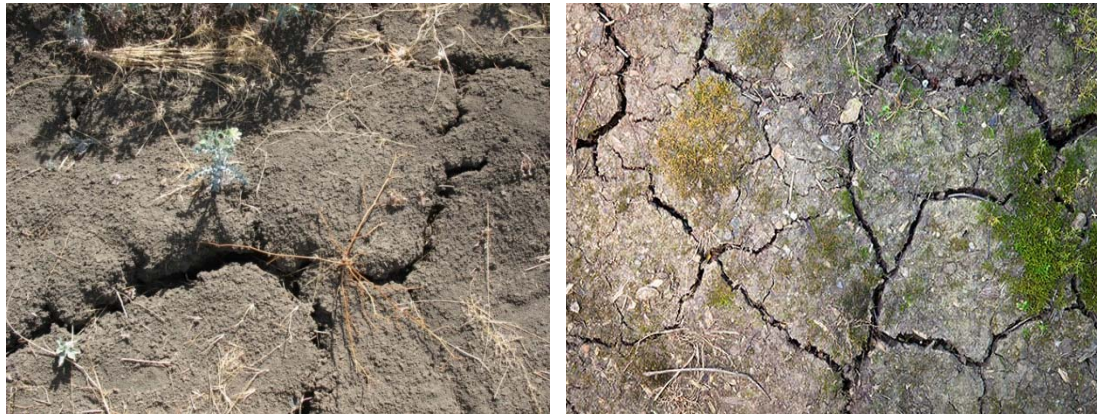


TILLAGE REQUIREMENTS FOR BLACK AND REDSOILS

BLACK SOILS - VERTISOLS

Properties : *High clay content * Low infiltration rate
* Deeper soil depth *pH more than 7.5

Problems : Hard when dry, sticky and not trafficable when wet
Optimum soil moisture range for tillage very narrow
High draft requirement when dry



BLACK SOILS - VERTISOLS

Management practices

- ❖ Deep tillage upto 30cm depth once in three years with 5t/ha of FYM
- ❖ Fall ploughing immediately after the harvest of *rabi* crop
- ❖ Shallow tillage upto 10cm depth with blade harrow (2 to 3 times)
- ❖ Shallow tillage with intercultivators (2 to 3 times) during cropping



RED SOILS - ALFISOLS

Properties : *Low clay content * High infiltration rate
* shallow to medium soil depth *Neutral soil pH(6.5-7.5)

Problems : Surface crust formation within 2 to 3 days of rains
Crusting after seeding results in poor seedling emergence, more so in small seeded cereals



RED SOILS - ALFISOLS

Management practices

- ❖ Deep tillage every year to break crust & pulverize soil
- ❖ Interculturing 2 to 3 times during cropping period
- ❖ Dead furrow opening at 3m during sowing & repeated at 30-40DAS
- ❖ Use of rotary type spiked roller on crusted soil to break crusts



MULCHING FOR DRYLAND SOILS

MULCHING

Multi-pronged approach to conserve soil and water and manage weeds. Mulches are commonly used in areas subject to drought and weed infestation.

Categories of mulches

***Surface mulching *Vertical mulching * Live vegetative barrier**

Advantages of mulching

- Intercepts raindrops & reduces run-off and soil loss**
- Suppresses weeds and reduces weeding costs**
- Increases soil organic matter**
- Improves soil physical & chemical properties**
- Increases soil water holding capacity & regulate soil**

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SURFACE MULCHING

Organic materials / residues

Stubbles, crop residues and other organic residues are spread on the surface to reduce evaporation & increase soil moisture



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SURFACE MULCHING

Soil / dust mulch

It includes opening ridges and furrows at suitable lengths and seeds are sown in the furrows and ridges are broken during first inter-culturing. This results in an adequate dust mulch.

Followed in vertisols where long breaks in rainfall result in deep and wide cracks on the soil



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VERTICAL MULCHING

It involves opening of trenches of 30cm depth and 15cm width at regular vertical intervals. Stubbles are stacked in these trenches & are made to protrude up to 10cm above the ground.

These mulches act as intake points and divert run-off water to sub-soil layers



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LIVE VEGETATIVE BARRIERS

Under this mulching method, suitable plant species are planted on the contour key lines and they act as vegetative barriers and effective mulch.



Different types of tillage operations may be adopted in dryland areas depending upon the situation of the farm to get more benefit

General theory of tillage in dryland areas is to reduce the tilling operations as far as practicable.

Pre-monsoon tillage and maintaining of crop residue (mulch) at the time of tillage is another factor to be considered in dryland areas.