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EC58-123 Revised 1959 Questions and Answers about Stubble Mulching

C. R. Fenster

F. L. Duley

J. C. Swinbank

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QUESTIONS AND ANSWERS ABOUT

Stubble Mulching

BY

C. R. Fenster Extension Agronomist

F. L. Duley Soil Conservationist, Agricultural Research Service, U. S. D. A.

J. C. Swinbank Extension Agronomist

● What is Stubble Mulch Farming?

A year-round system of managing plant residues in which all tilling, planting, cultivating and harvesting operations are performed to keep a sufficient amount of the residue on the surface at all times for soil protection.

EXTENSION SERVICE
UNIVERSITY OF NEBRASKA COLLEGE OF AGRICULTURE
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W. V. LAMBERT, DIRECTOR E. W. JANIKE, ASSOC. DIRECTOR

What Are Residues?

Remains of plants. Can be small grain straw, corn or sorghum stalks, stubble, weeds, etc.

Should Weed Residues Be Used?

They are satisfactory if they do not carry mature seed. However, weed growth will deplete soil moisture. In case of extreme drought and a shortage of crop residue, some weed growth may give fair protection to the soil.

What are The Advantages of Stubble Mulch Farming?

Controls wind erosion.

Reduces water erosion.

Increases intake of water

Tends to check the decline of organic matter.

Makes fall tillage possible to kill weeds and at the same time leave the stubble standing to catch snow and provide cover for the soil.

Where rainfall is less than about 20 inches, slightly higher yields can be expected from stubble mulch than from plowing.

What Are the Disadvantages of Stubble Mulch Farming?

Weeds, especially cheatgrass and volunteer wheat, may be more difficult to control. This is particularly true in wet seasons.

Protein content of wheat may be slightly lower.

Soil stays warm longer in the fall of the year and cold later in the spring of the year than where land is plowed.

What Things Are Necessary For A Good Stubble Mulch Program?

The desire to make the system work on your farm.

Know the amount of residue at the beginning of the season. There will be about 100 lbs. of residue for each bushel of wheat produced.

The amounts of residue necessary after the crop is planted to protect land from wind erosion are approximately:

1000 lbs. on heavy soils.
1500 lbs. on medium textured soils.
2500 lbs. on sandy soils.

Plan tillage operations in advance so the desired amount of residue will be left on the land at seeding time.

Select proper equipment for each operation and use it effectively.

What Implements Can Be Used To Keep Sufficient Residue On The Surface During Land Preparation?

Sweeps--24 inches wide or larger.

Rod weeder with semi-chisels or small sweeps.

Straight blade machines.

Chisel plows.

One-way. Should be used not more than once on average amounts of residue--usually the first operation in spring.

Rod weeders.

How Do These Machines Compare in Conserving Residue?

Straight blade machines and sweeps--24 inches or larger--may leave from 50% to 75% of the residue anchored on the surface of the soil after four operations.

Rod weeders with small sweeps or semi-chisels will usually leave 40% to 60% of the residue after four operations.

Chisel plows may leave approximately 50% to 70% of the residue after two operations.

The one-way, if run too deep, may bury much of the residue at one operation. If set at a long angle and run only deep enough to cut all the surface, it will cover but little residue.

Straight rod weeder--leaves about the same amount of residue as sweep and straight blade machines. (Used as a secondary tillage machine.)

Narrow sweeps or chisels bury more residue than wide sweeps. The drier the residue and the more frequently the ground is worked, the greater the loss of cover.

In What Sequence Should These Machines Be Used For Fallowing?

Sweeps, straight blade machines, or rod weeders with semi-chisels or small sweeps may be used for all tillage operations except possibly the last.

The one-way may be used, especially during wet seasons or in extremely heavy stubble, for the first operation. One of the above machines may be used for later operations.

For the last tillage operation a plain rod weeder is often desirable. This kills the small weeds and firms the seedbed for drilling.

What Is Necessary To Make Sweep Equipment Operate Satisfactorily?

Desire to use the equipment.

Proper operation and adjustments--example: sweeps must run level.

Keep bolts tight.

Weight. If ground is hard, extra weight should be placed on the machine.

How Can One Drill Through Heavy Residues?

Hoe drills are generally more satisfactory than disk drills.

Rows, spaced 9 - 14 inches apart are the most satisfactory. There should be good

distance between front and rear rank of openers (at least 24 inches). The clearance--between the frame and the bottom of the hoe--should be at least 17 inches.

Press wheels should pack the seed firmly in the ground.

Shoes can be as much as 6 inches wide.

Disk drills with large disks may work satisfactorily.

If There Is Too Much Residue At Seeding Time, What Can Be Done?

Use a rotary hoe or skew treader to break up the residues, distribute them more uniformly and anchor them in the ground.

A disk pulled straight will also break up and anchor the residues. Weight may be needed.

Avoid excessive residue, if possible, by adjusting the tillage earlier in the season.

Will Stubble Mulching Work for Row Crops?

Yes. Ground can be prepared with a subtillage machine, then packed with a treader if desired.

Row crops can be planted with a planter equipped with furrow openers or with a lister operated at a shallow depth. It need not scour.

Furrows should be only deep enough for a clean seedbed in the row, but not so deep as to cover the residue between the rows.

The first cultivation can be done with a rotary hoe or skew treader. Later cultivations can be done with large sweeps (18 inches wide) on a cultivator.

Will Stubble Mulching Develop A Plow Sole?

No, if the depth of operations are varied. Ground should not be wet when tilling.

Are Insects and Diseases More Prevalent Under Stubble Mulch Than Black Fallow?

No. Researchers in the Great Plains have found no difference.

Will It Cost More To Stubble Mulch?

In general, no. Usually the number of operations, as well as the cost, will be less for stubble mulch.

Will A Heavy Wind Storm Blow The Residues Off The Land?

No, if tillage has been done properly. Residues should always be anchored in the soil.

What Should Be Done With Tall Heavy Residue?

Tall heavy residue can be cut by one-waying or disking. Do not chop or bury the residue on sandy areas in the field. Remember, the deeper you operate a one-way or disk the more residue you will bury. Tall heavy residue can also be chopped with machines such as a stubble chopper, cutter, or mower.

For further reference, see EC 54-100, "Stubble-Mulch Wheat Farming Methods for Fallow Areas", or U. S. D. A. Technical Bulletin No. 1166 "Stubble-Mulch Farming in western states.