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Cliff Ashburn

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Residue Management of Corn



ON SANDY IRRIGATED SOILS IN THE NORTH PLATTE RIVER VALLEY

by

Cliff Ashburn

Extension Farm Management and Irrigation Specialist

With the Cooperation of

Delbert Lane

Extension Agricultural Engineer

C. R. Fenster

Extension Agronomist

The Scotts Bluff Experiment
Station

Cooperating Farmers in the
North Platte River Valley

EXTENSION SERVICE
UNIVERSITY OF NEBRASKA COLLEGE OF AGRICULTURE
AND U.S. DEPARTMENT OF AGRICULTURE
COOPERATING
W. V. LAMBERT, DIRECTOR

1. Why farm sandy soils by a residue management program?

It will help control wind and water erosion for a year-around program.

Soil structure will be improved because of less operations in working the soil. Generally speaking, sandy soils are worked too much.

It is farming the way soils are formed by nature.

2. Is it cheaper to farm by this method?

Yes, because fewer operations are required.

Four operations are all that are necessary. The crop is planted, cultivated once, furrows are made for the irrigation, and it is harvested.

3. What equipment is necessary for planting row crops in residue?

There are 3 types of machinery that work well for planting corn in residue. They are:

Lister--revised for narrow furrow opening and operated at a shallow depth.

Planter equipment with furrow openers--for planting at a shallow depth.

Till-Planter--a machine for preparing the seed bed, planting, and fertilizing in one operation.

1. A till-planter requires a large amount of power.

2. Fluid in the tires as well as wheel weights are required to eliminate slippage.

4. Is it necessary to disk the residues before planting?

If corn follows corn it is not necessary to prepare the old residue before planting. However, it is permissible.

5. How do you plant in the residue where corn follows corn?

When using a planter equipped with furrow openers or a lister, the machine should be operated at a shallow depth.

The furrows should be only deep enough for a clean seed bed in the row.

The residue should not be covered between the rows.

If corn stalks bother, a rolling coulter may be used in front of the furrow openers.

When using the modified lister or furrow opener the corn may be planted in the same rows as the year before. The corn roots and stubs will be moved into the furrow. The ridges will be partially leveled as the old ridge will be moved into the old furrows. The reason for planting in the old corn row is the fact that the leaves from the crop of the previous year have fallen down into the old irrigation furrow and will be covered by soil so that it is hard to plant in the old irrigation furrow.

When using a till-planter the corn can be planted about 4 to 6 inches from the old row. This will let the sweeps operate free from residue. The field will also be partially leveled as the ridges will be moved into the old furrow. The upper sweep should run about 2 inches below the surface of the soil.

The sweeps may have to be narrowed, depending upon the residue and depth of the old irrigation furrow. The upper sweep may be from 20" to 36" in width, depending on which will work best.

Gauge wheels in front of the sweeps will help control the depth that the sweeps will operate. The sweeps should be adjusted so that they will be level both forward and crosswise.

6. How do you prepare a seed bed in other residues such as small grain?

The seed bed can be prepared with sub tillage machines, then packed if desired. By this method the row crops can be planted with a planter equipped with furrow openers or with a modified lister, operated at a shallow depth. However, the seed should be planted in moist soil.

Where the till-planter is used, the 36" sweeps should be used. It may be necessary to go over the residue with a screw-treader. The method selected should fit the situation.

The top sweep should run at least 2" below the surface of the soil. Gauge wheels in front of the sweeps will help control the depth that the sweeps will operate.

7. Do weeds become a problem?

Good cultivation with proper equipment and sweeps will control weeds.

If weeds do become a problem, broadleafed weeds can be controlled by spraying with 2-4D.

Weeds in corn adequately fertilized and watered will not hinder the growth of the corn. However, if weeds are allowed to grow and the soil becomes dry, producing poor soil physical conditions, yield can be reduced; but, under irrigation, this should not be the case.

8. Can weeds be used to help build residue on sandy soils?

Yes, if you keep the weeds out of the corn row.

Weeds in the center of the furrow can be left until the corn is about 12" to 20" tall before cultivating.

The weeds in the furrow can be left until they have a good growth before cultivating. Then by cultivating, the weeds will add residue and will help improve the structure of the soil.

9. How can the weeds be controlled by cultivation?

First, by having good equipment for the cultivation. The equipment should be such that pressure can be applied for holding the sweeps and disk in the soil.

The corn should be cultivated in the same direction that the corn was planted.

Disks can be used in front for throwing the soil out or in, or a double set can be used, first throwing the soil out and the second set for throwing the soil in around the corn. Half sweeps can also be used for the second set.

The disk should be 13 inches in diameter or more for best results.

Sweeps should be used on the back tool bar. The sweeps should be wide enough to give good weed control in the furrow. The sweeps should be run nearly flat or the point slightly lower.

Equipment with a floating tool bar can give trouble as the sweeps are hard to keep in the soil.

10. How many cultivations are needed?

Usually one cultivation is all that will be needed. Where weeds are few in the row of corn it is not necessary to cultivate early.

The weeds between the rows can be left until they have a good growth. They will not harm the corn as long as there is moisture and fertility. However, the weeds should not be left until they interfere with the growth of the corn.

11. How do you fertilize corn planted in the residue?

Most sandy soils are low in organic matter, thus making them low in nitrogen. The soil should be tested for the phosphorous level.

Where the modified lister is used or a planter with a furrow opener, a starter fertilizer with nitrogen or both nitrogen and phosphorous can be used at the time of planting.

More nitrogen can be side-placed when the corn is about 18 inches tall.

Where the till-planter is used, and moisture is adequate, the fertilizer can be placed 3 to 5 inches in a band below the seed. The rate of nitrogen can be from 40 to 120 pounds of available nitrogen per acre.

If needed, a starter fertilizer can be applied at the time of planting, even if a high rate of nitrogen has been placed below the seed.

The side-placing at planting time with needed fertilizer will give the corn an early start and will also help the corn recover in case of hail.

A starter fertilizer can be used at the time of planting and the rest of the N can be side-placed when the corn is 18 inches tall.

Where zinc is needed it can be placed as a starter or with the deep application of nitrogen.

12. How are the furrows made for irrigation?

Regular furrow openers can be used for the irrigation furrows. The furrows should be made from 6 to 8 inches deep.

If weeds are a problem in the row, disks can be used in front to throw soil around the corn.

The old corn stalks will be covered and should not interfere with the irrigation water.

If stalks are a problem at the time of making the furrows, rolling coulters may be run in front of the furrow openers.

13. When irrigating corn, why should more frequent irrigation be used on sandy soils?

This is because sandy soils are not capable of holding a large amount of water. A coarse, sandy soil will hold $\frac{1}{2}$ to 1 inch of available moisture per foot of soil. Fine, sandy soils will hold from 1 to $1\frac{1}{2}$ inches of available moisture per foot of soil.

On the light, sandy soils a light application at more frequent intervals between irrigations will give good results and less leaching of fertility.

Corn enters a critical period in its development as the tassels begin to emerge. The soil moisture in the root zone should not be allowed to fall below 50% readily available moisture during the tasseling period. Bountiful soil moisture should be available until the corn has dent.

14. What length of row can be irrigated most efficiently on sandy soils?

Most of the sandy soils have a high intake rate of water. The best results will be obtained by short runs. Runs from 400 feet to 600 feet in length will give the best results. The length of run will depend on the soil texture.

15. How can you tell the length of run by checking with a soil auger?

Select several adjoining furrows in an average part of the field. Measure off and stake stations every 50 to 100 feet along plot selected. Make equal distribution and control of water and turn into all furrows. There should be equal quantities of water in each furrow. The quantity of water per furrow should usually be the maximum non-erosive stream for the prevailing conditions. Note time water is turned on and when it reaches each station.

While water is running, make examination of the vertical penetration near the upper end of the furrows with moisture probe or soil auger. When the penetrating water has reached the bottom of the normal root zone of the mature crop, note the time. Note the station reached by the water in the furrows in one-fourth the time required to wet the root zone at the upper end of the field. This indicates the length of run. Run a cross lateral at the station indicated, before next irrigation.

The duration of an irrigation run is determined by the penetration of water into the plant root zone.