Soil Conservation Pays

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Soil Conservation Pays

These South Dakota Farmers Say it Does
Foreword

This survey was made by the Extension Service in an attempt to secure an unbiased expression of opinion from South Dakota farmers of the value of soil and water conserving practices. The questionnaire was sent out in April, 1940, and covers the 1939 crop year.

The answers obtained were given by 23 farmers who were among the first to establish demonstration farms in cooperation with the Extension Service and the Soil Conservation Service, located as shown in the sketch on the cover of this booklet. Five answers were secured from Charles Mix county; three from Minnehaha; two from Brookings and one each from Pennington, Corson, Custer, McCook, Haakon, Sanborn, Mellette, Lyman, Perkins, Hutchinson, Buffalo, Brule and Edmunds.

All answers are from farmers who have carried out the practices on their own farms at their own expense and using their own labor. The only assistance they received was technical advice as, for example, staking out contour lines. The experimental results from Hays, Kansas and Goodwell, Oklahoma have been taken from publications from those States and are presented here in brief form for South Dakota readers. The results from Alcester are a part of a study made by the Soil Conservation Service and the Extension Service.

Ralph E. Hansen, Extension Soil Conservationist.

Soil Conservation Pays

The Questions Asked

Has contour farming increased, decreased or made no change in crop yields?

- Increased the yield ........................................ 9
- Decreased the yield ....................................... 0
- Made no change ........................................... 12
- Question not answered ................................... 2

Typical Answers:

- "No change due to drought, grasshoppers and hail."
- "It has increased crop yields at least 30 percent in all four years tried out so far."

Compared with straight row farming, what has been the increase or decrease of yield per acre?

Typical Answers:

- "My straight row farming wheat made 7 bushels per acre and the contoured wheat made 13 bushels per acre."
- "Increased all of one-third the past two years."
- "Made very little difference—one or two bushels."
- "At least 30 percent on grain and more on alfalfa."
- "The years that I have experienced I have had no increase."

Has contour farming increased, decreased or stopped erosion?
Typical Answers:
"Contour farming has decreased erosion and even stopped it where it was very bad."
"We think it has stopped erosion for when we had a heavy rain not much water ran off the field."
"It has decreased erosion very noticeably."
"Contour farming has decreased erosion on my farm and in a few years I believe it can be stopped completely."

Has there been any saving in fuel by contour farming?
Saving in fuel .................................. 10
No fuel saving .................................. 3
No answer ........................................ 5
Uncertain ........................................ 5

Typical Answers:
"Tractor runs easier on the level."
"I would say at least 15 percent saving."
"About 25 percent decrease in fuel at harvest time, about the same at plowing."
"I use horse power and it takes less labor."
"Takes a little less fuel and gives more even power."
"There would be a great saving of fuel if a man put the small plots into grasses."

Does contour farming require more or less time than straight row farming?
Requires more time ............................ 13
Requires less time .............................. 4
No change ....................................... 4
No answer ........................................ 2

Typical Answers:
"It does take a little more time but not a great deal. It's worth the extra time."
"We think it takes a little more time but not enough to be of much consequence."
"It would take less time if we could get the land not in the contour strips back into grass."
"More time by about 10 percent. The reason for more time is working out odd patches between strips."

Has soil moisture been increased or decreased or made no change as a result of contouring?
Increased soil moisture ........................ 15
Decreased soil moisture ....................... 0
No change ....................................... 5
No answer ........................................ 3

Typical Answers:
"We have never had enough moisture to enable us to tell."
"There is a lot more moisture on the contours."
"Soil moisture has been increased at least 25 percent or more. It stands the hot summer winds longer."
"It has increased soil moisture."
Have the conservation practices instituted on your farm increased or decreased or made no change in the value of your farm?

- Increased the value: 10
- Decreased the value: 1
- No change: 10
- No answer: 2

**Typical Answers:**

- "It has increased the value to me."
- "It has increased the value, I believe, 25 percent or more."
- "Conservation practices have made no change in the price of land here, as prices have been very low for some time."
- "I believe it has increased the value of the land."

Have pasture furrows or water spreader ditches increased, decreased or made no change in the amount of grass?

- Increased the grass: 11
- Decreased the grass: 0
- No change: 3
- No answer: 9

**Typical Answers:**

- "I believe it has increased the grass. I know it has increased the moisture content of the soil."
- "Increased the amount and quality of the grass."
- "The grass has increased considering the amount of rain we have had."

"Has increased grass about 25 percent."
"Very much increased—I would say at least 50 percent."
"Pasture furrows have helped my grass."

Have contour furrows or water spreader ditches been effective in controlling runoff?

- Has controlled runoff: 15
- Has not controlled runoff: 3
- No change: 0
- No answer: 5

**Typical Answers:**

- "Yes, the surplus water goes off more slowly and penetrates the soil and stops gully washing."
- "Yes, there is very little runoff on contoured land."
- "They failed when we had a heavy rain."
- "Yes, the water spreader ditches have been effective."
- "It has reduced runoff almost half, I believe."

What is your opinion of the general benefits of the conservation plan on your farm?

- "More grass, more and better crops and less chance of erosion."
- "We had very little rain last year. I did notice water standing in the terraces after some of the rains."
- "I am satisfied that contour farming and terracing will pay big in time to come."
- "I would not farm any other way after four years of practices. It is getting better each year. The unlimited lost water now on the way to the Gulf of..."
Mexico—none of it came off my farm.”

“The two main benefits are to stop erosion and conserve moisture.”

“It keeps soil from washing away and also helps hold runoff water. It takes less power to work on the level instead of up and down hill.”

“I believe it will save topsoil and moisture and the longer it is practiced the more good it will do.”

“We will have to use conservation or quit farming.”

“I am planning to lay more of my land out in contour strips.”

“Many people tell us that since we contoured the pasture that the grass has made a wonderful comeback. These same people laughed at us when we had it done.”

“It increased the moisture and ‘stand’ by stopping a large share of the erosion.”

“It is worth-while.”

**Experimental Results Agree**

Seeding small grains on the contour is surprisingly effective in retaining rainfall on the land and in preventing soil erosion when the slopes are not too steep. An indication of the effectiveness of this practice in holding rainfall and consequently in preventing soil erosion is indicated by the yields of wheat in the tests conducted at the Hays, Kansas, Experiment Station. The wheat drilled with the slope yielded 9.9 bushels per acre, while the wheat drilled on the contour yielded 12.5 bushels per acre—an increase of 2.6 bushels per acre, due to seeding on the contour. The practice saves soil losses as well as water.

**Table 1—Effect of Contour Drilling on Yield of Grain**

<table>
<thead>
<tr>
<th>Method of Treatment</th>
<th>Bushels per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat drilled with slope</td>
<td>9.9</td>
</tr>
<tr>
<td>Wheat drilled on contour</td>
<td>12.52</td>
</tr>
</tbody>
</table>

5 Years Results on 4% Slope at Hays Experiment Station

The practice of contour listing is a valuable practice for preventing soil erosion and for retaining the rainfall on the land. It is interesting to note the difference between plain listing of soil on the contour and plain listing with the slope in the amount of soil and rainfall lost per acre. The loss of water was ten times as great on lands listed with the slope as it was on land listed on the contour. The loss of soil per acre was 27 times as great on land listed with the slope as it was on land listed with the contour. Basin listing with the slope saved a little less than half of the runoff water but saved about 80 percent of the soil loss.

**Table 2—Effect of Kind of Surface on Forage Yields**

<table>
<thead>
<tr>
<th>Method of Treatment</th>
<th>Forage Field Cured Tons per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smooth tilled surface planted</td>
<td>1.91</td>
</tr>
<tr>
<td>Basin listed with slope</td>
<td>2.58</td>
</tr>
<tr>
<td>Common listing with slope</td>
<td>2.06</td>
</tr>
<tr>
<td>Common listing on contour</td>
<td>2.52</td>
</tr>
</tbody>
</table>

5 years Results on Kafir Plots (1934-38) at Hays Exp. Station

The variation in the different tools used in protecting summer fallow against water runoff and the con-
sequent loss of soil and moisture as well as to afford protection against wind erosion is indicated in Table 3.

Table 3—Average Effect of Tillage on Soil and Water Losses at Hays, Kansas, on 4 Percent Slope

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Water Loss Per Cent Runoff</th>
<th>Soil Loss Tons per Acre per Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fallow</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duckfoot with Slope</td>
<td>17</td>
<td>7.6</td>
</tr>
<tr>
<td>Smooth Tilled</td>
<td>17</td>
<td>6.6</td>
</tr>
<tr>
<td>Duckfoot on Contour</td>
<td>10</td>
<td>2.5</td>
</tr>
<tr>
<td>Hole-digging Cultivator</td>
<td>8</td>
<td>2.4</td>
</tr>
</tbody>
</table>

The effectiveness of contour listing in preventing water runoff and therefore erosion is indicated in Table 4.

Table 4—Average Effect of Tillage on Soil and Water Losses at Hays, Kansas, on 4 Percent Slope

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Water Loss Percent Runoff</th>
<th>Soil Loss Tons per Acre per Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparation for Kafir</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Listed with Slope</td>
<td>20</td>
<td>13.6</td>
</tr>
<tr>
<td>Smooth Tilled</td>
<td>19</td>
<td>9.1</td>
</tr>
<tr>
<td>Basin Listing with Slope</td>
<td>11</td>
<td>3.1</td>
</tr>
<tr>
<td>Listing on Contour</td>
<td>2</td>
<td>0.65</td>
</tr>
</tbody>
</table>

Basin furrow listing is also an effective method, but is most effective when done on the contour as indicated in the table above.

At the Goodwell, Oklahoma, station which is representative of the Great Plains area it was found that terracing of farm land where needed gave an average yield of wheat and milo for the period 1926 to 1935 of 11.6 bushels. While the yields on similar land not terraced were 8.5 bushels showing a gain of 3.1 bushels per acre in the yield because of terracing. At the prevailing prices for these products the gain was $2.33 per acre. From this should be deducted 57 cents as the added cost of maintaining and operating the terraced ground.

Table 5—Value of Terraces

<table>
<thead>
<tr>
<th>Grain, Bushels per Acre (Wheat, Milo)</th>
<th>Terraced</th>
<th>Not Terraced</th>
<th>Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value (per acre per year)</td>
<td>11.6</td>
<td>8.5</td>
<td>3.1</td>
</tr>
<tr>
<td>Average increased cost per acre per year</td>
<td></td>
<td></td>
<td>.57</td>
</tr>
<tr>
<td>Net gain per acre per year</td>
<td></td>
<td></td>
<td>1.75</td>
</tr>
<tr>
<td>Total gain in 10 years</td>
<td></td>
<td></td>
<td>17.50</td>
</tr>
</tbody>
</table>

Goodwell, Oklahoma, 1926-1935

Table 6—Effect of Level Terraces on Grain and Forage Yields

<table>
<thead>
<tr>
<th>Method of Treatment</th>
<th>Grain Bushels per Acre</th>
<th>Forage Field Cured Tons per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Terraced level with open ends</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6&quot; vertical interval—contour farmed</td>
<td>13.34</td>
<td>2.424</td>
</tr>
<tr>
<td>12&quot; vertical interval—contour farmed</td>
<td>10.48</td>
<td>2.36</td>
</tr>
<tr>
<td>Not terraced—farmed with the field boundaries (¾ of area on approximate contour—2% land)</td>
<td>6.86</td>
<td>2.455</td>
</tr>
<tr>
<td>Not terraced—farmed up and down slope 2% to 4% land</td>
<td>3.00</td>
<td>2.00</td>
</tr>
</tbody>
</table>

2 years Results on 11-acre Kafir Plots (1937-38) at Hays Experiment Station
which leaves a net profit of $1.75 per acre or $17.50 for the 10-year period as the value of the terracing. Table 5 shows the result of these tests in detail.

In a comparison of soil conservation and of normal farm practices at the Hays, Kansas Experiment Station, it was found that good soil conservation practices increased yields of grain crops materially. Table 6 gives the results of the tests.

**Contouring Saves Money**

**Studies Relative To Production, Time and Cost Of Contour Versus Block-Type Farming At Alcester, S. D.**

These studies were made at the Alcester SCS-CCC Camp area during 1939, which was a year of low rainfall. The data reported here were taken from farm business records. The information is from six farms with similar soil types and slopes. Table 7 shows comparative yields, time and cost of producing corn on contour and block-type farms.

**Table 7—Corn**

<table>
<thead>
<tr>
<th>Type of Farming</th>
<th>Bushels Per Acre</th>
<th>Man Hours Per Acre</th>
<th>Man Hours Per Bu.</th>
<th>Value $ per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contour</td>
<td>33.2</td>
<td>9.8</td>
<td>.294</td>
<td>$18.92</td>
</tr>
<tr>
<td>Block</td>
<td>28.2</td>
<td>9.05</td>
<td>.320</td>
<td>$16.07</td>
</tr>
<tr>
<td>Difference</td>
<td>5.0</td>
<td>.75</td>
<td>.026</td>
<td>$2.85</td>
</tr>
</tbody>
</table>

1. Farm value of corn was figured at 57 cents per bushel.

In addition to the figures shown in Table 7 this study revealed that man and power hours per bushel were slightly lower in favor of contour farming on a cost basis. Table 8 shows comparative yields, time and cost of producing oats on contour and block-type farms.

**Table 8—Oats**

<table>
<thead>
<tr>
<th>Type of Farming</th>
<th>Bushels Per Acre</th>
<th>Man Hours Per Acre</th>
<th>Man Hours Per Bu.</th>
<th>Value $ per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contour</td>
<td>28.6</td>
<td>3.8</td>
<td>.13</td>
<td>$7.15</td>
</tr>
<tr>
<td>Block</td>
<td>13.0</td>
<td>2.98</td>
<td>.22</td>
<td>$3.25</td>
</tr>
<tr>
<td>Difference</td>
<td>15.6</td>
<td>.82</td>
<td>.09</td>
<td>$3.90</td>
</tr>
</tbody>
</table>

1. Farm value of oats was figured at 25 cents per bushel.

This study also showed that contour farming took less man hours, less power and miscellaneous hours per bushel figured on a cost basis. Table 9 shows comparative yields, time and cost of producing barley on contour and block-type farms.

**Table 9—Barley**

<table>
<thead>
<tr>
<th>Type of Farming</th>
<th>Bushels Per Acre</th>
<th>Man Hours Per Acre</th>
<th>Man Hours Per Bu.</th>
<th>Value $ per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contour</td>
<td>20.9</td>
<td>4.5</td>
<td>.214</td>
<td>$9.20</td>
</tr>
<tr>
<td>Block</td>
<td>10.4</td>
<td>2.3</td>
<td>.216</td>
<td>$4.58</td>
</tr>
<tr>
<td>Difference</td>
<td>10.5</td>
<td>2.2</td>
<td>.002</td>
<td>$4.62</td>
</tr>
</tbody>
</table>

1. Farm value of barley was figured at 44 cents per bushel.

Man, power and miscellaneous costs per bushel were also slightly lower in favor of contour farming.

397421
Opportunity Knocks

By Reuben Brigham

Sometimes we live so close to our problems that we fail to see them. For that reason I want to bring you a foreigner's viewpoint of our problems. This viewpoint is not my own, but the viewpoint of a person from another country—Odette Keun, a French woman, who came over here and made an intensive study of American problems with especial relation to the TVA. She made a report, "A Foreigner Looks at the TVA," and I'm going to quote part of it:

"You must listen to some statistics. No, it's no earthly good telling me that statistics are boring. Whether they bore you or not, I've taken the trouble to compile them for an excellent reason, and listened to they'll be. It is my duty to give them as wide a publicity as I can, and it is the duty of every American to meditate on them with the utmost seriousness. If I, a foreigner, have been frightened by them, every American should be panic-stricken by them. They prove the staggering fact that America is not a permanent country; that another century of the present processes will leave her unable to maintain the agriculture on which her civilization rests; and that she is on the way to join those decadent or dead parts of China, Mesopotamia, and Asia Minor, which were once opulent, and now are stripped forever of their fertility. Unless something effective is done, and done within a generation, it will be too late to cure her earth-disease over very numerous and very large regions. Did you hear me? It will be irrevocably too late."

She pointed out that of the 1,903,000,000 acres of land in the United States, half was affected by erosion; 34 percent had lost one-third to three-fourths of the topsoil; 10 percent had lost three-fourths of the topsoil. Then she said further:

"The annual rate of loss is increasing.

"The cumulative loss may be conservatively stated as already not less than ten billion dollars.

"If this earth-wastage is not stopped, in another 50 years the cumulative loss will be 25 to 30 billion dollars, equivalent to the loss of four thousand dollars on each and every farm in the United States.

"And remember that this is not a loss of income the flow of which can be resumed, but of assets that cannot be recovered, for it takes Nature centuries to make the equivalent of the topsoil which has been swept away—at the rate, in some places, of 3 to 6 inches in a single season . . . . ."
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