1-1952

Summary of Information Given at Fortified Farming

Agricultural Extension Service, South Dakota State College

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SUMMARY OF INFORMATION GIVEN AT

Fortified FARMING

$ $ WORTH MONEY TO YOU $ $

AGRICULTURAL EXTENSION SERVICE
SOUTH DAKOTA STATE COLLEGE · Brookings
U. S. DEPARTMENT OF AGRICULTURE
GEORGE I. GILBERTSON, Director
In Furtherance Acts of Congress May 8, June 30, 1914

Fortified Farming Is Needed Now and For Future

United States farmers have done heroic jobs of producing food during the past 10 years. Now our country needs even greater farm production in 1952. And for future years increasing food demands are likely. Farmers will need to produce more. At the same time we must "fortify our farming" by maintaining and building up our soil.

Reasons: 1, We need more for our military mobilization; 2, we have 22 million more people than in 1940; 3, each civilian now eats 13% more than he did 15 years ago; and 4, our exports of farm products are 50% greater than the 1935–39 average.

On top of this, U. S. grain reserves are low. We may have only 336 million bushels of corn left in storage by next summer—we should have 800 million. We will have about 335 million bushels of wheat next July—we should have 500 million.

YOU CAN'T increase crop acres or livestock numbers much, BUT YOU CAN increase crop yield and livestock production.

Just take a look at this table—

By Using These Practices	Yields May Be Increased This Much		
	Corn	Spring Wheat	Alfalfa
Adapted Seed Varieties	33%	47%	55%
Best Rotations for Area	87%	94%	22%
Commercial Fertilizers	93%	109%	111%
Adapted Seed + Rotations	107%	125%	89%
Rotations + Fertilizers	120%	141%	133%
Adapted Seed + Rotation + Fertilizer	133%	156%	144%

Can You Afford Not To Use Them?

You can also increase your livestock production by: 1, Improving pastures and ranges; 2, Feeding more feed as silage; 3, Producing high quality hay; 4, Balancing your livestock rations; 5, Getting the best breeding stock you can; 6, Controlling diseases

and parasites; 7, Providing good housing for livestock and poultry.

The price outlook is expected to be favorable. Farm prices will vary around 105% of parity unless there is a drastic change. Grain prices will be supported at 90% of parity. By present law, no price ceiling can be set at less than 100% of parity.

These prices and the extra production you will get will pay you to:

Use Adapted Seed, Use Soil Building Rotations, Use Commercial Fertilizers, and Use Other Production Increasing Practices. Where your additional production covers your additional costs, it is good business to "fortify your farming."

About a Soil Conservation District

What is it? A legal subdivision, set up and operated to carry out soil conservation programs.

Why are they? Many water and erosion problems involve more than a single farm. A district makes cooperation possible to solve them and supplies qualified technical assistance.

How organized? First a petition, then a hearing, then a vote.

Who governs them? A board of five local supervisors; three elected by the farmers; two appointed by the State Committee.

Technical assistance: The U. S. Soil Conservation Service assigns a trained conservationist upon request.

I live in a district. How can I get their help? Ask one of your district supervisors, the county agent or the county PMA.

What will they do for me? Study your farm, draw up a complete conservation plan with you. No cost to you for planning, layout, engineering work. Where earth-moving, ditching or other such work is needed, you pay the District the rates they set up which are figured at cost. Usually the District employs a contractor. The District is non-profit.

Am I obliged to establish all practices shown on my farm plan? No. Those needed but which you feel you cannot put into practice immediately are included as "recommended." The District operates on basis of voluntary cooperation.

Are these practices eligible for PMA payments? Yes.

What do district technical services cost me? Nothing. They are services provided by the taxes you pay. You pay these taxes whether you are in a District or not.

Soil Is What You Make It

Certainly all soil is not equal in fertility or productivity. It was not equal originally and it is not equal now. The average soil in South Dakota now contains 40% less **organic matter;** 35% less **nitrogen;** and 16–20% less **phosphate** than before it was farmed. This has happened during a 60–80 year period.

Each operator takes the land as it is when he assumes control of it. From then on, "it is what you make it." Its productivity may stay the same; or it may get worse or it may get better. That depends on how you use and manage your soil.

We are particularly concerned with the top seven inches of soil. Crops, except grasses and legumes, take most of their plant food, from the top.

About half of the nitrogen and 35% of the phosphorous is in the top seven inches. And that area is where we find most of the nitrogen and phosphorous in the form for plants to use.

As we crop the land, we cause the organic matter to decompose more rapidly, until after 60 to 80 years, the original supply is down nearly half.

As the organic matter decreases, the soil breaks up into finer particles. This fine material erodes more readily. And when it

rains, this fine material runs together into a tight mass. Water cannot penetrate it rapidly and erosion results.

During this same period, we have reduced the nitrogen supply by more than one third and the phosphorous one-sixth to one-fifth.

All of this can mean only—reduced crop yields.

With the increased demand for food and the increased cost of producing food, can we afford to continue such practices?

A soil management program that provides for crop rotations containing grasses and legumes; for returning crop residues to the soil; for plowing under legumes for green manure; and the use of commercial fertilizers when needed, will improve the condition of the soil and increase yields.

When we plow under a growth of legumes, we may add from 25 to 150 pounds of nitrogen per acre, depending on the growth turned under. That will also add a lot of organic matter. Plowing under a grass also adds considerable organic matter.

Increased organic matter improves the soil tilth. It absorbs water faster and holds more of it.

Both experiments and farmer experience show that wheat following three to four years of grass has increased the yield two to four bushels per acre and increased corn up to 15 bushels.

Wheat yields following sweet clover were up from four to six bushels. And corn after sweet clover, up to nine bushels an acre more.

When phosphate was added to the sweet clover as it was plowed under, the yields of both corn and wheat went up another three bushels.

Yes, the soil and its production is what we make it.

Only Adapted Varieties Are Safe

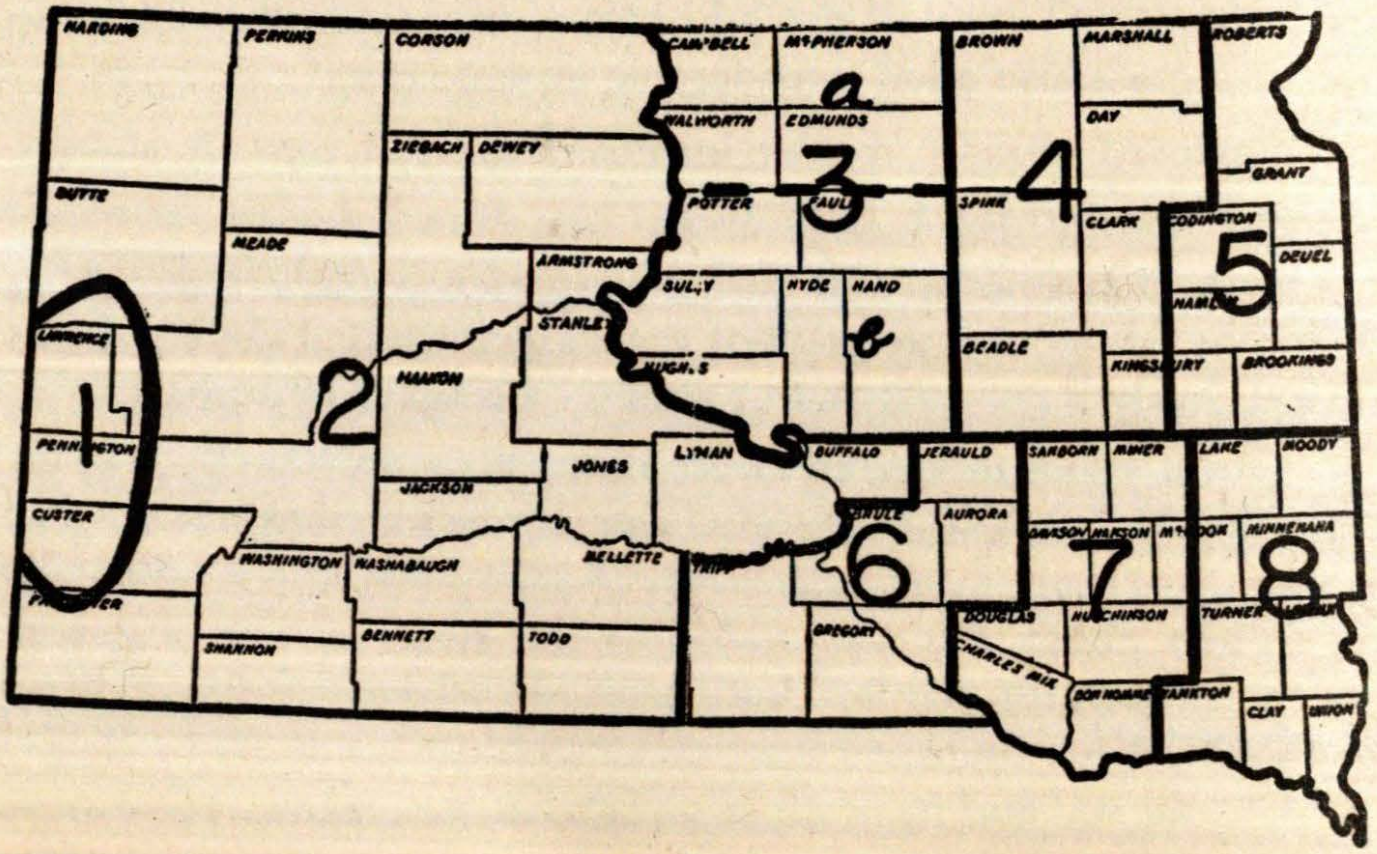
Planting adapted small grain varieties eliminates one of the main hazards. Varieties recommended by your State College of Agriculture are those that have proved themselves for **several years.** Until proved, they are not recommended.

Late varieties often invite disaster since they must complete their growth and ripen during drouth, heat, grasshoppers. Early varieties do best on fertile soil. We can't outguess the weather but we can improve fertility, build up organic matter, conserve moisture and use varieties for South Dakota's normal season.

Recommended Varieties

Spring Wheat: Rushmore, Pilot, Rival, Mida, Lee, for all areas.

Winter Wheat: Minter, Nebred, south part of 2, 6, 7, 8. Iowin, Iohardi, south part of 8.



Amber Durum: Mindum, Vernum, Nugget, Areas 2, 3, 4, 5, 6, 7. Stewart, north half of 3, 4, 5. Kubanka, 2, 6.

Oats, James Hulless, all areas. Clinton, Marion, Bonda, 4, 5, 8, east part of 7. Mindo, Andrew, Cherokee, Nemaha, 3, 4, 5, 7, 8. Shelby, 5, 8. Brunker, Osage, Trojan, Vikota, 1, 2, 6, south two-thirds of 3, west part of 7.

Barley: Odessa, Kindred, 4, 5, 7, 8, north of 3. Feebar, Velvon 11, Tregal, all areas. Plains, 1, 2, 6, 7, south half of 3 and 4. Spartan, 1, 2, 6. Wisconsin 38, 5, 8, east of 7. Compana, west half of 2.

Flax: Redwood, B-5128, area 5, north half of 4. Marine, Sheyenne, 3, 4, 5, 7, 8.

Hay and Grain Drying Pays

You're probably wondering what it costs to dry grain and hay, how long it takes, what equipment do you need. Here's the experience of a Colton, S. D. farmer, this fall.

He had 372 bushels of 40% moisture ear corn, worth 60c per bushel. With his drying outfit, he dried the 372 bushels down to 255 bushels of 12% moisture corn, worth $1.60 a bu. The deal looked like this:

372 bu. @ 60c	**$223.20**
255 bu. @ $1.60	**408.00**
Gross profit	**184.80**

Cost of Drying: Machine cost ($1,900 dryer, life 10 years, depreciation and interest per hour 71c) for

24 hours required drying time	$17.04
420 gals. bottled gas @ 10c	42.00
Electricity	3.00
Total Cost	$62.04

Subtracting cost from gross profit, we have:

Gross Profit	**$184.80**
Cost of drying	**62.04**
Net Profit	**$122.76**
Drying Cost per Bushel	**23.4c**
Profit per bushel	**48.2c**

This cost per bushel may seem high but it must be remembered that 1951 corn was extra wet. Under ordinary conditions with perhaps 25 to 30% moisture corn, the cost would be less. His equipment included:

500 bu. steel bin with false floor	**$700.00**
Drying unit—9,000 cu. ft. air per min. fan; gas burner capable of heating air to 130 degrees	**$1900.00**

The bin, although equipped with a perforated false bottom for drying, can also be used for ordinary grain storage. The same drying outfit can be used for drying hay.

Here's cost of drying hay, based on experiment results of the U. S. department of agriculture. These are the fuel and electricity costs for drying 40% moisture hay to 30 tons of dry hay in a 1,200 sq. ft. mow, using air delivered at 18,000 cubic feet per min.

Air heated to degrees	Time, days	Cost	Cost per ton
70	**12.5**	**45.00**	**1.50**
90	**3.1**	**40.89**	**1.36**
110	**1.9**	**41.77**	**1.39**
130	**1.4**	**42.54**	**1.42**

These hay drying figures are computed to show only operating cost, which include only fuel and electricity. To arrive at the actual cost, depreciation and interests costs should be added. In the corn drying example, this was about 71c per hour.

It will also be noted, that in drying hay, that as the air was heated, the cost went up but the cost per ton went down. Using supplemental heat cuts down the time necessary to do a drying

job. Depreciation costs would be greater without heat since it will take more time. The main saving in adding heat is in electricity since the machine need not run so long.

Stopping Loss in Your Granary

You are in for an awful shock if there are weevils or other insects, rats or mice in your granary and you don't know it. Many a farmer has opened up a bin of what he thought was perfectly good grain and it was nothing but a mass of light, empty hulls. It isn't worth much to sell or for feed either.

Insects do most of their damage by chewing out the insides of the kernels or feeding on the germ. Rats and mice chew up the grain and contaminate it. Dirty grain received in market terminals is a big problem to grain buyers. If there is too much of it, it is reflected in a lower price to you.

These pests are apt to be worse this year because of high moisture. Cold weather is no handicap to them because if it is below zero outside, wet grain will be warm inside. Grain should be stored as dry as possible.

To keep on the safe side, make a careful **inspection** of your stored grain at least every **three weeks.** Reach down into it and check for heating. Watch for webbing formed on the surface—a sign that meal moths are at work. Look for insects and hollowed kernels.

If it looks suspicious and you still don't know, put a quart jar sample in a warm place. If insects are there, they'll show up.

If you find insects, prepare to fumigate. Most elevators and drug stores have excellent grain fumigants for sale. They cost from about $3.50 to $4 a gallon. Six gallons will treat 1,000 bushels. Follow container directions closely. Fumigants are liquids which turn to gases after application. Spray on the surface and the heavy vapors will sink through the grain. Fumigate when **grain** temperature is 65 degrees or higher.

The best way to keep out rats and mice is to rat-proof the granary and use a good poison like warfarin.

Before putting grain in a bin, clean it out thoroughly, eliminate rats and mice. Spray floor and walls with 2.5% DDT at the rate of 2 gallons per 1,000 square feet of surface area. (2.5% DDT equals about 1 quart of 25% DDT emulsifiable concentrate in 2½ gal. water.)

Chemical Weed Control Methods

Weeds cost South Dakota farmers each year about the same as it costs to run the state government two years—$44 million. Tests at Brookings show that creeping jenny cut wheat yield from 21.7 to 12.6 bushels per acre—more than half. Oats was cut from 44½ to 30 bushels.

One of the best ways to fight weeds is to seed only weed-free, pure certified seed. When you buy, insist on a blue certification tag.

Creeping Jenny: 2,4-D, ½ to 1 lb. per A, apply bud to bloom stage in spring or late fall.

Leafy Spurge: 2,4-D. In cultivated lands, 5 repeated applications, 2,4-D ester 1 lb. per A 2 years, combined with cultivation when necessary. In sodded fields, 2–3 lbs. 2,4-D ester per A, applied at the flowering stage.

Russian Knapweed: 2,4-D has given poor results, not generally recommended. Cultivation on big patches. Sodium chlorate or boron effective on small patches.

Perennial Peppergrass: 2,4-D, preferrably amine salt in advanced rosette to early bud stage, 1 lb. per A gives some reduction in stand. On sodded land, 1–3 lbs. repeated treatment for 2–3 years reduces stand considerably.

Canada Thistle and Perennial Sow Thistle: Two shots of 2,4-D each year for 2 or more years generally eradicates. First application bud stage; second, in fall when resprouts are in rosette.

Quack Grass: Cultivation is most practical method of controlling this weed. TCA effective when applied 40–80 lbs. per A. Generally must be followed with more. Aug. to Oct. best time.

Horse Nettle: 2,4,5-T, 1½–2 lbs. per A. pretty good results. Apply when in full bloom.

Wild Oats: No chemical gives control at present. Cultivation and crop rotation most satisfactory.

Silo and Silage Pays Well

Why Make Grass Silage? Unfavorable weather often ruins the first cutting of alfalfa or clover. Losses are often heavy and the feed value of the hay poor.

Good grass silage can be made when wet weather makes it hard to properly dry hay. This helps to keep harvest on schedule, giving the second crop a good start before dry weather.

The carotene (Vitamin A) of the hay is preserved more effectively in properly made silage. Coarse, stemmy, weedy, crops which make poor hay may be used with less waste. They usually make better feed as grass silage.

How About Preservatives? If you are inexperienced in making grass silage, it would be wise to use a preservative to help insure good results and improve the quality. This is particularly true if the silage is high in moisture (80–85%).

Most common preservatives are molasses (approximately 50% sugar) ground shelled corn or small grain or corn and corn-and-cob meal. These are added to the silage as it is blown into the silo. Amounts to use for each ton of these grasses:

	Molasses	Ground Grain	Corn-and-Cob Meal
		Pounds	
Legumes	60	150	200
Legume and grasses mixed	40	125	150
Oat or other cereal	30	100	125

Wilting Method: High quality silage can be made without a

preservative if the moisture can be reduced to 65 to 70% by wilting in the sun. This will take 2–3 hours in the swath for early cut material with bright sunshine and wind, longer if weather is cool and cloudy.

A test after chopping to see if it is dry enough: When a handful squeezed together tightly and then released, the ball of green material should expand slowly and break apart in several sections. If it puffs up suddenly and falls apart completely, it is too dry. If you can squeeze out juice and it remains in a compact ball, it is too wet.

A silo is a good way to make use of soft corn. Soft corn stored during the winter can be made into silage in the spring, if done before it spoils.

Feeding Ear Corn Silage: Ear corn silage runs higher in protein and total digestible nutrients than regular silage. It requires less protein supplement and hay to make average daily gains.

Here's a brief feeding guide for ear corn silage. You can use many variations depending whether you are fattening, wintering on a maintenance basis or feeding for slight gains.

Breeding Cows: 20–30 lbs. ear corn silage with dry roughage daily.

Wintering Calves: To gain ¾ up to a pound a day, 6–8 pounds silage with all the hay they want.

Fattening Calves: All silage they will clean up along with a pound of soybean oil meal and 2–5 lbs. alfalfa hay daily.

Fattening Lambs: 2½ lbs. silage; ½ lb. corn; 1 lb. alfalfa daily.

Breeding Ewes: 1½–2 lbs. daily with dry roughage.

Brucellosis Is One of Your Big Thieves

Brucellosis (infectious abortion) is the most costly South Dakota cattle disease. Of cattle tested, about 8% are found to have it.

It is estimated that 5% of S. D. cattle are infected. More dairy than beef cattle have brucellosis.

Brucellosis causes loss of the use of the cow for a year and also the loss of her calf. Prevention and control depend upon a strict sanitary program, coupled with a testing and vaccination program.

The Cause: By a germ carried from one animal to another, entering through the mouth on contaminated feed. The germs are easily killed by disinfectants but may live for six months unless exposed to sunlight.

Brucellosis usually gets a start in a herd by bringing in an infected bred heifer. The bull is not an important factor in spreading it. After a cow has aborted, she may carry the germ as long as six years, giving them off in excretions.

Symptoms: Most important is premature birth of the calf. Abortion may happen anytime but most commonly between 5th and 7th month of pregnancy. Heifers abort more often than older cows. Most heifers abort only once; rarely more than three times. Usually brucellosis will run out in a herd in about four years unless no new susceptible animals are introduced. Many aborting cows will retain the placenta or "afterbirth."

Treatment: Treatment is largely strict sanitation. The herd, if found infected, should be supervised by a veterinarian. Infected cows should not be bred for 60 days after an abortion, nor allowed to run with the herd. All dead calves should be burned. Stalls and barns thoroughly cleaned and disinfected.

Vaccination: Helpful if properly done. Vaccination is much more satisfactory in young cattle. There has been entirely too much promiscuous vaccination in adult cattle. The first step is to have the cattle blood-tested. After this, your judgement must decide the course of control.

Depending on circumstances, reactors may be removed and a clean herd maintained. This is the only satisfactory system if you

sell whole milk. Of course, pasteurization kills the germs.

Another system: Vaccinate heifer calves between 6 and 8 months old and remove all reacting cows. If it is a hardship to take out all infected cows, some of the better ones may be kept as long as they are useful. Continue to vaccinate heifers.

Vaccination causes a reaction—an inconvenience in selling breeding cattle.

For your protection, insist on a certificate of brucellosis free in buying cattle. It's bad if it gets in your herd.

Small Fruits Grow Well

Strawberries and raspberries will produce abundantly most every where in South Dakota. These easy-to-grow fruits will go a long way to supply at low cost the fruit which is helpful to a healthy diet.

Recommended Varieties

Strawberries (June Bearing)
- Aberdeen
- Burgundy
- Fairfax (best for freezing)
- Premier
- Senator Dunlap

Strawberries (Ever Bearing)
- Gem
- Red Rich
- Streamliner

Raspberries
- Latham
- Flaming Giant
- Chief
- Madawaska

Currants: Red Lake. **Gooseberries:** Pixwell.

What you need for successful small fruit growing:

- The right variety
- Fertile, well-drained soil
- Organic matter worked into soil
- Summer cultivation, weeding
- Supplemental irrigation
- Timely plot renovation
- Two-inch deep winter mulch
- Insect and disease control

Eating Right Is Important

To protect your family's health, every person should eat at least **one** food from each of these groups **every** day. They are the

protective" foods. If you eat some food from each group, you will have the balanced diet you need to keep strong and healthy.

Bread
Cereal
Flour

Meat or Fish
Poultry
Eggs
Nuts

Butter

Green and Yellow Vegetables

Citrus Fruit
Cabbage
Tomatoes

Milk
Cheese

Potatoes
Other Vegetables

Grocery bills will be high but you can eat just as nutritionally and save money by "selective" buying. And by producing more of your food at home.

Here are two groups of foods, equally as nutritious but one is more costly than the other.

Expensive Foods	Lower Cost Foods
Prepared Cereals	Rolled Oats
Bakery Bread	Homemade Bread
Better Grades of Meat	Beans, Fish, Eggs, Poultry
Butter*	Butter*
Head Lettuce	Cabbage, Home Canned Tomatoes
Oranges*	Beets and Carrots
Fewer Potatoes*	Milk*
Frozen Vegetables	More Potatoes*
Milk*	

*Butter, milk, potatoes and oranges belong in every diet, no matter the cost. However, costs can be reduced by eating the foods in season and getting your protein, Vitamins A and C from vegetables both fresh and dried, and low cost bulk cheeses. Potatoes, a good nutritious, inexpensive food, can be increased in a low-cost diet and are a good source of Vitamin C.

Missouri River Progressing

Harnessing the Missouri river to supply low-cost electric power and irrigation will help "fortify" our farming. Here's a report on how the project is coming:

Angostura, Hot Springs; and **Shadehill,** Lemmon, complete.

Ft. Randall will distribute power in 1954.

Oahe near Pierre, under construction.

Keyhole, Moorcraft, Wyo., complete spring of 1952.

Other dams now in planning or investigational stages are **Gavin's Point,** Yankton; **Pactola** on Rapid Creek; **Big Bend,** below Pierre; and the dams on the White River and in the James river valley.

The lines to distribute power from Randall and Oahe are under construction. These include the East River Loop (Sioux Falls, Brookings, Watertown, Groton, Huron, Mt. Vernon) lines from Ft. Randall to Winner, Midland to Rapid City and Ft. Randall to Mobridge.

Electric power from Ft. Randall will be available to all South Dakota REA cooperatives in 1954.

It is estimated that the total amount of electric power now available in South Dakota is 169,000 KW. Oahe and Randall together will generate 819,000, more than four times the present total. (Randall 320,000; Oahe 490,000.)

Population increases usually follow irrigation. Due to irrigation, population of Scottsbluff county, Nebraska, quadrupled (405%) between 1910 and 1940 although the state as a whole gained only 10.4 during that period.

1951 Returns from Irrigation Development Farms

	Alfalfa T.	Corn Bu.	Oats Bu.	Barley Bu.	Potatoes Bu.	Sugar Beets T.
Huron	3.6	93.0	52.0	42.3	*	*
Redfield	4.5	95.4	71.3	51.2	536	30

*Not tried at Huron.