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The Spirit Lake Beacon

OFFICIAL NEWSPAPER FOR SPIRIT LAKE AND DICKINSON COUNTY, IOWA

a special soil conservation supplement

thursday, may 20, 1976

destruction



protection



it's your choice

the annual report of the dickinson county soil conservation district

upstream engineering seeks to slow the raindrop in its journey to the sea

In the uplands, where floods form, nature teaches a lesson by throwing across practically every foot of land under forest or natural grass cover an interlacing system of tiny dams. A dead leaf, a blade of grass, or a root tangle can stop a raindrop from running, hold it back; and floods are made up of raindrops infinitely multiplied. Wise land use is simply an

adaptation of nature's conservation and flood-control methods to the conditions of advanced cultivation. Instead of leaving fields smooth and bare, inviting erosion, the idea is rather to roughen the surface, turn the earth itself and the plants themselves, into impediments to run-off, protectors of the soil. By the simple device of plowing and cultivating

around the hill, on the contour, instead of up and down the hill, each furrow, each harrow scratch, becomes in effect a small dam or terrace. On steeper slopes somewhat more elaborate methods may be needed, but the principle of all of them is simple: To make running water walk or creep, to store a far greater part of it in that greatest of all reservoirs—

the soil; and to do this by making the soil and its crops provide, as impediments to run-off, millions of natural little dams.

Agriculture cannot offer a substitute for floodwater fortifications downstream, but it can offer a multitude of reinforcements upstream, where the raindrop falls upon the land.

Henry A. Wallace.



Grass anchors soil against erosion. Its decaying remains make the soil absorptive. Its roots bind the soil in place and open tiny conduits into the earth. Its blades and stalks are countless tiny impediments to the downhill flow of water that has fallen on the land. Slow water does little damage; grass makes running water creep. Neither man nor nature has found a more effective weapon against soil and water waste.

Soil conservation makes extensive use of grass. Good pastures shed little water, lose little soil. Meadowlands are well protected by their covering. Grass-paved waterways and terrace outlets conduct excess rainfall slowly and harmlessly downhill to drainage streams.

grass

trees

Forest puts a roof above the soil, covers it with a protecting carpet, and ties it into place with grasping roots. Rain strikes gently beneath trees. Running water finds myriad obstructions on forest floor matter thick with fallen leaves and twigs. Water finds it hard to move forest-anchored soil.

On millions of acres trees are nature's ultimate soil protectors. On the steepest slopes, up the ragged banks of gullies—where nothing else will do—trees stay the flow of running water and hold the soil in place.



To grow crops, man must till the soil. But cultivation and conservation are not incompatible. Man can adapt both crops and cropping practices to the purposes of conservation.

Strip cropping is such an adaptation. Clean-tilled crops invite erosion, offer no resistance to run-off water. Thick-growing crops hold soil, are barriers to running water. In a strip-cropped field, dense crops alternate with clean-tilled crops in bands around the contours of the land. Soil-laden water from the strip of clean-tilled land is stayed and filtered of its load by the close-growing crop in the strip below.

Soil conservation protects gently sloping fields with strip cropping. It combines the practice with terracing to protect even steeper slopes. It applies the principle of rotation to the strips for increasing the soil's fertility, its absorbcency, and its resistance to erosion.

crops



run-off control a major operation of dickinson county soil conservation service

THE SOIL CONSERVATION SERVICE is undertaking to safeguard the farm and grazing lands of the Nation from soil erosion. Over most of the country, this means controlling excessive run-off of rainfall. Thousands of measurements show that from 5 to 75 percent of rain water is lost, as immediate run-off, where sloping land is cultivated without protection. This uncontrolled run-off causes soil wastage by accelerated erosion.

Soil conservation, therefore, involves the use of every practical method of storing more of the rain in the great

reservoir of the soil for minimizing the abrasive effects of run-off, for reducing the hazard of floods, and for safeguarding plant life against inadequacy of soil moisture. As much as possible of rainfall also must be held in small upstream reservoirs to replenish the underground water supply and to raise the water table.

Thus far, operations of the Soil Conservation Service on approximately 50 million acres of land have proceeded on a watershed-demonstration basis. The objective is to devote

every square foot of complete watersheds to those practical uses to which they are by nature best adapted; and to make economic use of every drop of water that can be conserved in a practical way. Effective plans for the complete treatment of a watershed with a coordinated conservation program calls not only for stabilization of the land and conservation of water but also for economic adjustments, and for economic utilization of all the resources within a watershed—its soils, its water, its forests, its wildlife, and so on. Small water-conservation reservoirs can be utilized to

supply water for stock and man, for safeguarding and developing wildlife, for irrigating small plots of ground, and for developing power for isolated communities.

Land management is incomplete without water control and conservation. By the same token, water control and conservation are essential to protection of the land. In effect, wise land use is only restoring the land to the closest possible approximation of natural conditions. That means an integrated development of all resources.



furrows

Furrows up and down the slope are gutters that concentrate and speed rainfall, with its burden of topsoil, from the land to drainage streams.

Furrows around the slope are dams that hold rainfall on the land, store it in the vast reservoir of the soil.

Soil conservation tills sloping land on the contour, never up and down. It spaces contour furrows at intervals on pasture land to dam up rainfall, force it to penetrate the earth. Moisture in the soil increases the growth of grass, and grass, in turn, puts its own countless tiny dams across the path of run-off water.



terraces

Sloping cultivated fields are waterways. Rain water runs from steeply sloping land with the speed of a mountain torrent. Strong dams and large ones are needed.

Terraces are cropland dams across the face of cultivated fields. Broad-based, and with proper grades, they offer sturdy resistance to the downhill rush of water, yet make no clumsy ridge to interfere with tillage. Farmers plow the terrace as they plow the field, or sow it broadcast with grass or grain that binds the soil.

Soil conservation builds terraces around the contours of steeply sloping land and supports them with strip cropping and contour tillage. It puts grass-paved waterways at the terrace end to carry excess water harmlessly downhill to a protected area or drainage stream.



Gully control begins on land that sheds water into gully channels. But down in the gully itself, inexpensive dams slow the flow of water, nullify its cutting power, force it to drop its load of silt. Vegetation, with its network of clutching roots, can take permanent control.

A small dam can turn a natural drainage, a depression in the land, a potential gully into a farm pond or reservoir for building up both surface and underground supplies of water. Water for stock, for crops, sometimes even for power and recreation, can be caught by little dams. And water held on the land cannot swell streams to flood stage.

dams

recognition of a group of men

known as the dickinson county soil conservation commission

RECOGNITION by

Duane L. Curry, ASCS,
County Executive Director

Over the years a group of men known as the Dickinson County Soil Conservation Commissioners have developed many worthwhile projects in addition to the appropriate soil practices they help to administer. They have sponsored a tree sales project whereby farmers in the area could purchase and have their trees delivered to the Soil Conservation Service (SCS) office at planting time. This project plus Federal cost-shares have made for more windbreaks and wildlife habitats than would have been possible without our two agencies working together.

They have encouraged conservation through a speech contest consisting of a five to ten minute presentation on a different theme each year.

This is open to all eligible junior high and highschool students in the county. The grade school pupils are encouraged to participate in a poster contest depicting any of their thoughts on needed conservation problems or environmental needs.

In addition to the above they are one of the sponsors of the Soil Survey now in progress throughout the county.

The Commissioners have cooperated and have had fine working relations with all governing bodies such as the Extension Service, County Board of Supervisors and the local ASCS Committee. Through sound planning of the Agricultural Conservation Program (ACP) and application of any needed practices on their own land, I feel these men should be commended.



DICKINSON COUNTY SOIL CONSERVATION DISTRICT COMMISSIONERS

Seated left to right: Jim Yungclas, Assistant Commissioner; Ernie Skow, Chairman; Chas. Shorey, Secretary; back row left to right: Bob Ingwersen, Don Schubert and Andy Hoffman.



CLAIRE CHAMPINE RESIGNS

Claire Champine, a Dickinson County District Commissioner for seven years, resigned in January 1976. In above photo Chairman Ernie Skow and Commissioner Bob Ingwersen are presenting Claire with a distinguished service award for his years of service as a commissioner. Mr. and Mrs. Champine moved to Missouri early this year

205 posters entered in county contest

POSTER CONTEST

The Dickinson County Soil Conservation District Commissioners held their first Poster Contest in 1975. The contest was very successful with 205 posters entered in the contest by 3rd, 4th, 5th, and 6th

graders in the county. These posters were displayed at the Spirit Lake Home and Sport Show. 1st, 2nd and 3rd place winners were selected in each grade in each school. The commissioners plan to make this contest an annual event.

WINCO GENERATORS AND CROWS SEED CORNS

PHONE BOB DICE

832-3198 or 832-3219

LAKE PARK, IOWA

soil survey begins in april, 1976

by
Wayne Dankert,
Soil Scientist

A soil survey, or inventory of the soils in the county, is now in progress. Soil maps are prepared by field examination of soils and landscapes and plotting boundaries between different soils on air photo maps. Mapping is now in progress in Westport Township.

When field work is completed, the entire survey will be made available to the public. The County Assessor will use the maps as the basis for one factor in placing a fair assessment value on the land for real estate taxes. The maps show soil type, percent of slope, depth of topsoil and other soil features.

The survey is being completed as a cooperative effort between the Soil Conservation Service, I.S.U. Experiment Station and Dickinson County Board of Supervisors. A team of three SCS soil scientists—Wayne Dankert, party leader; Larry Hanson and Ron Reckner are making the survey.

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terrace systems

by
Dennis Rustman,
Soil Conservation
Technician

Terracing continues to be a very much needed erosion control practice in Dickinson County. There are many acres of land in the county subject to soil erosion that should be protected with conservation practices. Terraces will control soil loss well within allowable limits.

The past few years have marked a definite change in terrace construction techniques. There are three types of terraces in Dickinson County that are being used: the tile outlet grassed backslope, the tile outlet broad base and the graded terrace. The tile outlet grassed backslope terrace has become the most



The primary purpose of a tile outlet terrace system is to reduce sheet erosion on cropland fields. Tile outlet terraces keep any eroded soil in the field, reduce the rate of runoff, and eliminate the need for waterways. They can often be laid out parallel, eliminating point rows and making the field more farmable.

Terracing alone may not completely control sheet erosion.

Crop rotations, conservation tillage, and good soil management may also be needed.

Tile outlet terraces also benefit the local environment. By reducing soil loss from the field, they reduce sediment pollution in streams. Seeded backslopes also provide excellent wildlife cover.

popular. This type of terrace can be built across depressions and waterways giving straighter, easier to farm terrace systems with less point rows. In some instances, according to the lay of the land, these terraces can be built parallel to existing fence lines. Underground tile carries runoff safely from the field,

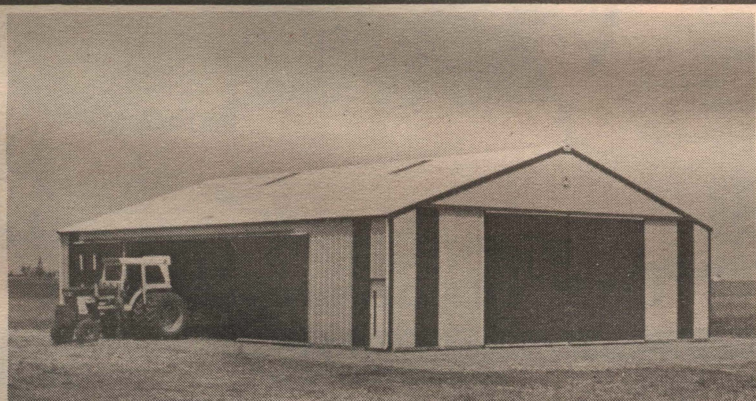
eliminating the need for grassed waterways.

Another advantage of the tile outlet terrace is the natural topography improvement. The soil that does erode between terraces is trapped in the low areas around intakes. These areas build up gradually and the field becomes more nearly level.

Dickinson County farmers who have installed terraces in 1975 are: Bernadine Wang, Center Grove Township; Ed Heikens, Excelsior Township; Don Schubert, Center Grove Township; Fred Woods, Okoboji Township; and Robert Ingwersen, Superior Township. There is cost sharing available for building terraces.

Up to 75 percent of the cost can be paid by state and federal funds. This leaves 25 percent of the cost left to be paid by the landowner.

If you are interested in having terraces built on your farm or would like more information on them, contact the Soil Conservation District Office in Spirit Lake.



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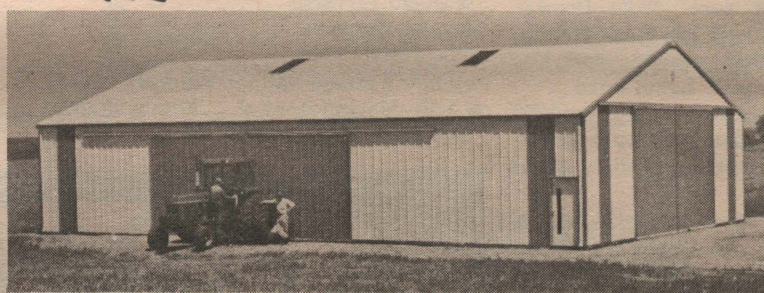
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it was a very good year

district activities

JANUARY—Commissioners Bob Ingwersen, Claire Champine, and Clarence Call, District Conservationist, attended the Commissioners' Short Course in Ames on January 22.

FEBRUARY—The Dickinson County Soil Conservation Speech Contest was held on February 27 at the Soil Conservation Office beginning at 7:00 p.m. Judges for this contest were: Mrs. Ruth Ann Vandonslear, Milford; James Yungclas, Spirit Lake; and Robert Fitzpatrick, Milford. Winners were: Mike Brower, Spirit Lake, first; Ron Schmidt, Spirit Lake second; and Kay Curry, Spirit Lake, third.

Commissioners furnished 835 conservation workbooks for 5th, 6th, 7th, and 8th graders in the county.

MARCH—Commissioners Claire Champine, Charles Shorey, Ernest Skow and Bob Ingwersen, and Clarence Call, District Conservationist, attended the Regional Commissioners' meeting in Humboldt on March 14.

Commissioners and District Conservationist met with the Dickinson County Supervisors on March 18.

Commissioners conducted their first annual poster contest for grades 3, 4, 5 and 6. 204 posters were entered in the contest. First, second and third prize ribbons and money were awarded to each grade in each school. Posters were displayed at the annual Spirit Lake Home and Sport Show on April 5 and 6.

APRIL—Commissioners and District Conservationist attended 1975 Development meeting with ASCS County Committee.

MAY—Doug Christensen, student trainee, began work in the county this month.

Dennis Rustman, Soil Conservation Technician, attended

the Soil Conservation Technician's training school at the Presbyterian Camp from May 27 to 29.

Commissioners furnished bulletin covers and inserts to all the churches in the county for Soil Stewardship Week.

Clarence Call showed slides and spoke to the Spirit Lake 6th graders. He also assisted the District Conservationist from Clay County with an Environmental Workshop at Camp Foster for 6th graders.

JUNE—Bonnie Penrose an elementary teacher in the Spirit Lake Community School, attended the Environmental Education Workshop at the Springbrook State Park. Commissioners paid her tuition for this workshop.

JULY—Commissioners held their annual picnic at the home of Mr. and Mrs. Claire Champine on Francis Sites.

Mr. and Mrs. Clarence Call, Mr. and Mrs. Dennis Rustman,

Douglas Christensen, Mr. and Mrs. Chuck Shorey, Ernie Skow and Bob Ingwersen attended the Regional Commissioners' meeting held at Stub's in Spencer on July 23.

AUGUST—Clarence Call set up a helicopter air tour around the Iowa Great Lakes for State Soil Conservation dignitaries which included terracing, farm ponds, soil erosion problem areas etc. Included on the helicopter were: State Committee members, Tom Kenny, Walt Hagen, Don Johnson, George Annan, Bob Welp and Jerry Norland; Ex Officiol and Advisors, Gene Hertel, Min Ameniya, Bill Oschweld, Jim Meimann, Othie McMurphy and Carl Schnorr; SCS Officials, Bill Brune, Glen Black and Chuck Cobb; State Soil Conservation Officials, Bill Greiner, Fred Higginbottom, Leon Foderberg, Marv Ross, Dan Lindquist, Ed Beardsley and Elaine Thompson; press and others, Wendell

Pellett, Tom Smith, George Gollinghorst, Tom Robinson, Bob Kenyon, Monte Sesker and Don Muhm. The district commissioners transported these people by car to the feedlot pollution control facility at the farm of Mrs. Glen Hall near Big Spirit Lake.

SEPTEMBER—Clerk attended the annual conference held at the Hotel Savery in Des Moines on September 7, 8 and 9.

Clerk attended all day meeting in Cherokee on September 9 on state cost-share.

District Conservationist conducted a tour of the Don Schubert terraces for the Milford High School Environmental class. A tour was also held on the Mrs. Glen Hall feedlot pollution control facility for the same class.

OCTOBER—District Con-

servationist conducted a conservation outdoor classroom for the Milford High School Environmental class.

NOVEMBER—The District Conservationist took part in a bi-monthly conservation program aired on KICD throughout the year.

DECEMBER—Claire Champine, District Conservationist for seven years, submitted his resignation this month. Mr. and Mrs. Champine are moving to Missouri.

District Commissioners held their annual Christmas dinner at the Crescent Beach Lodge on December 20.

Ten regular monthly meetings and one special meeting of the Dickinson County Soil Conservation District Commissioners were held this year.

clarence call . . .



district conservationist

accomplishments

Practice	Unit
New District Cooperators	29
District Cooperators Cancelled	18
Recipients of Technical Assistance	199
Technical Services-Single Land Units	408
Recipients Applying Practices	108
Conservation Plans Prepared	32
Conservation Plans Cancelled	15
Conservation Plans Revised	16
Inventories and Evaluations Prepared	2
Technical Services Units of Government Agencies	9
Units of Government-Agencies Assisted	2
Inventories and Evaluations (UOG) Agencies	3
Land Use Regulations-Conservation Standards	1
Group Conservation Plans Prepared	1
Group Inventories and Evaluations Prepared	2
Groups Assisted	3
Technical Services-Groups of Land Units	4
Groups Applying Practices	1
Referrals Services	51
Agricultural Waste Storage Facility	2
Conservation Cropping System	5,439 acres
Contour Farming	43 acres
Critical Area Planting	5.5 acres
Crop Residue Management	2,071 acres
Detailed Soil Survey	1,540 acres
Diversion	650 ft.
Pond	1
Farmstead and Feedlot Windbreak	1.7 acres
Grassed Waterway or Outlet	1.8 acres
Holding Ponds	1
Minimum Tillage	2,719 acres
Pasture and Hayland Management	750 acres
Gradient Terraces	3,050 ft.
Parallel Terraces	2,900 ft.
Subsurface Drain	107,489 ft.
Wildlife Wetland Habitat Management	36 acres
Wildlife Upland Habitat Management	44 acres
Land Adequately Treated	1,820 acres

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the problem of sediment

by
Clarence M. Call,
District Conservationist

As long as the topsoil remains on the fields, it is very much an asset. It is worth \$1500 to \$2000 an acre. But once it is removed from the fields and deposited in road ditches, rivers and lakes, it becomes very much a liability. The value of the land and the lakes both suffer. Once topsoil is removed from the fields, it is no longer called topsoil. It is called sediment. And sediment is a problem.

The most significant pollutant of Iowa's waters is sediment. Not only does it do direct damage by clogging streams and lakes, it also carries pollutants into the water. These pollutants such as agricultural chemical residues (pesticides, herbicides), feedlot residues (nitrates, phosphates), and other pollutants.

Pollutants in Iowa waters fall in two categories, point source and non-point source. Point source pollutants are easily identified. A pipe from a plant or municipality discharging a pollutant into the body of water is an example. Non-point sources of pollution are not as easily defined. We know the pollutants are there, but their source cannot be pinpointed. Examples of non-point source pollutants are agricultural fertilizers, herbicides, pesticides and sediment from soil erosion.

It is much easier to treat the cause than the effect. It is cheaper and much more ef-



a roadside ditch in dickinson county filled with topsoil blown by the winter winds

fective to treat the fields than it is to dredge the lakes. Not only is the sediment expensive to remove from the lakes, its loss from the original site in the field decreases the value of the land.

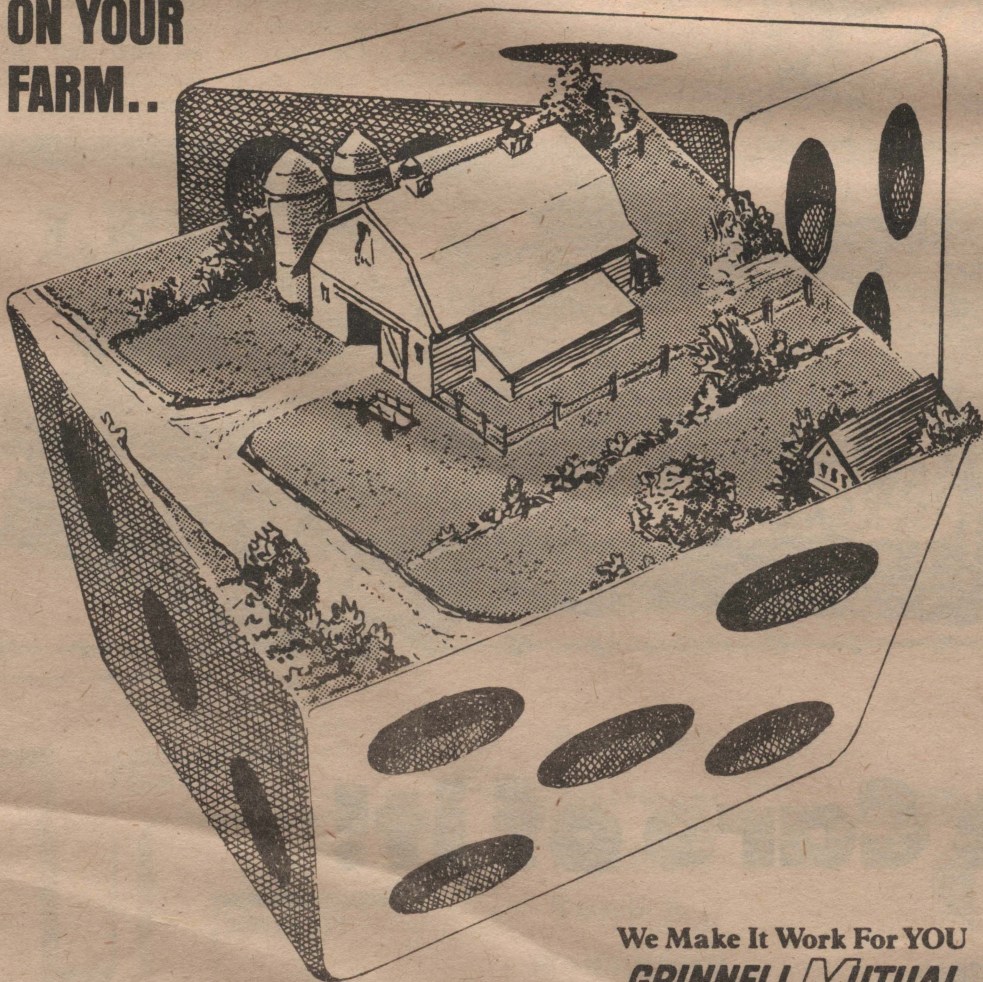
Landowners are going to be asked to cooperate more and

more in the near future. Land has always been a valuable asset and is becoming more so. It's going to take the cooperation of a great many people to get the job done. Non-point source pollutants are difficult to control, but not impossible. We are reasonably

sure that cost-share money will be available to help with the cost of these practices. We are also sure that the Dickinson County Soil Conservation District will be able to furnish all the technical assistance needed. Now all we need is your application for assistance.

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financial statement

fiscal year 1974-1975

District's I M Budget	
RECEIPTS	
Allocation from State Soil Conservation Committee	\$1,300.00
Brought forward from 1973-1974 fiscal year	.90
Additional allocation	60.15
Total Receipts	\$1,361.05

EXPENDITURES	
Commissioners' mileage, meals and hotel	\$665.03
Office supplies	82.56
Printing	179.90
Prizes for contests	93.00
Office expense	229.18
Meeting expense	89.58
Forwarded to 1975-1976 ledger	21.80
Total disbursements	\$1,361.05

II M Budget	
RECEIPTS	
Allocation from State Soil Conservation Committee	\$6,919.00

EXPENDITURES	
Salary Clerk	\$6,137.41
Travel	71.59
F.I.C.A.	359.05
I.P.E.R.S.	214.81
Life Insurance	36.00
Returned to State Soil Conservation Committee	100.14
Total Expenditures	\$6,919.00

III M Budget (State Cost-Share)	
1973-1974 Allocation	\$10,600.00
Total spent as of 12-31-75	9,298.24
Total returned to State Soil Conservation Committee	\$1,301.76
1974-1975 Allocation	\$10,600.00
Total Unobligated funds to date	423.45
1975-1976 Allocation	\$11,500.00
Set aside for Long-Term Agreements	983.00
Total unobligated funds to date	3,057.75

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sheet and gully erosion

Erosion has long been recognized as a serious problem on the deep loess (wind deposited) soils of western Iowa. Both sheet and gully erosion are common-place. Erosion on the uplands is usually accompanied by silt deposition in drainage channels and waterways and by flooding on bottomlands. These problems—plus frequent moisture shortages particularly in July and August—are major

limiting factors to crop production on soils that are capable of moderate to high grain and forage yields.

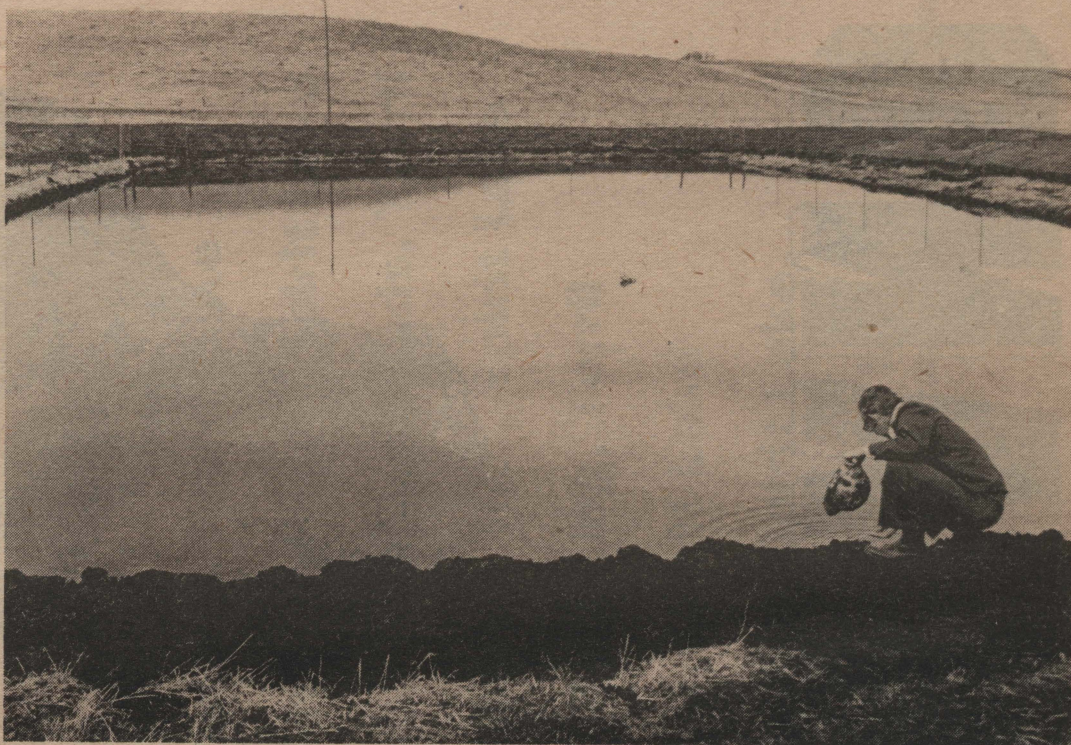
For many years, level terraces have played a major role in controlling erosion in western Iowa. Level terraces have also helped conserve moisture. Erosion control structures have been used to stabilize gullies and to retard flooding.

These techniques have been well accepted by many farmers and have proven effective where used. Yet there are some weaknesses: Erosion and farming operations tend to bench terraced land; farmers have not accepted terraces to the extent needed for control of water movement and soil loss; gully control structures are costly and warrant somewhat less frequent but more effective use.

THE AREA

The deep loess area of western Iowa comprises 4.4 million acres. It extends from Audubon County west to the Missouri River bottomland and from Sioux City south to the Missouri state line. The entire area is characterized by rolling and hilly topography and deep silty soils. Monona and Ida soils (fig. 1) occupy most of the uplands in the western part of this area and Marshall soils are dominant on uplands in the eastern portion.

As shown in table 1, the Ida, Monona and Marshall soils occupy about two-thirds of the entire area. The balance consists mostly of bottomland soils and the Hamburg soils, which occupy the steep bluffs just east of and adjacent to the Missouri River bottomlands. Because of their very steep topography, the Hamburg soils are seldom cultivated except for vineyards



**a man made pond in dickinson county
to control run off from adjacent slopes.**

and orchards. They are usually left in native grass vegetation. Nearly all of the Ida, Monona and Marshall soils are sloping, and the dominant slope is in the 9 to 14 percent range. Slopes are steepest in the western part of the area where slopes of 25 percent or more are common

THE SOILS

Most of the upland soils are formed from loess. They are dominantly silty and have little or no textural subsoil development.

While there is no distinct zone of clay accumulation in the subsoils, there is an increase in clay content within the region from west to east.

The Ida soils average about 20 to 24 percent clay, while the Marshall soils may have slightly more than 30 percent clay on the extreme eastern edge of their area of occurrence.

These soils are sufficiently permeable to permit the use of level terraces. Rates of water intake tend to be more rapid on the Ida than on the Marshall soils.

Upland soils of the area have other favorable characteristics which include the following:

Deep, productive

The loess in most of western Iowa is extremely deep and of fairly uniform texture throughout the profile. Large amounts can be moved without exposing infertile soil materials. Thus, the soil is capable of producing high crop yields when properly managed.

High water-holding capacity

Most soils of the area are silt loam in texture and can hold at least 2 inches of plant available water per foot. In addition, available pore space is high so there is approximately an additional 2 inches of temporary water storage capacity in each foot of the loess profile.

High infiltration rates

Water intake can be as high as an inch or more per hour if surface sealing is prevented and if water can be held on the surface of the soil long enough

to enter the soil profile. Conservation and soil management practices, land use and cover regulate the water intake rate.

Good workability

Because of the rapid infiltration rate and low clay content, these soils can be worked in a short time after rains. This is important in modern farming where timeliness of operations is important in efficient production. An Iowa State University study shows that western Iowa soils have a higher number of days of workability when compared with most other Iowa soils.

High calcium, potassium content

Most of these soils are high in lime and potassium. Usually, therefore, these elements do not need to be added to maintain high levels of fertility. However, corn will respond to potassium applied as row fertilizer. Additions of lime are sometimes needed on Marshall soils which lie in the eastern portion of the deep loess area.

There are also other favorable factors which should be recognized when working with land and water problems in this soil area.

The people have accumulated experience over a period of 25 or more years in working with soil and water conservation programs in soil districts and watershed development units. They have demonstrated a willingness to attack problems relating to soil and water loss and to gullying, which has been severe.

Availability of technical assistance along with adequate earth-moving equipment has contributed to the progress already made. Yet after a quarter century of intense effort, water loss, sheet erosion, severe gullying and sediment accumulation in stream beds and drainage facilities continue to be paramount land-use problems.

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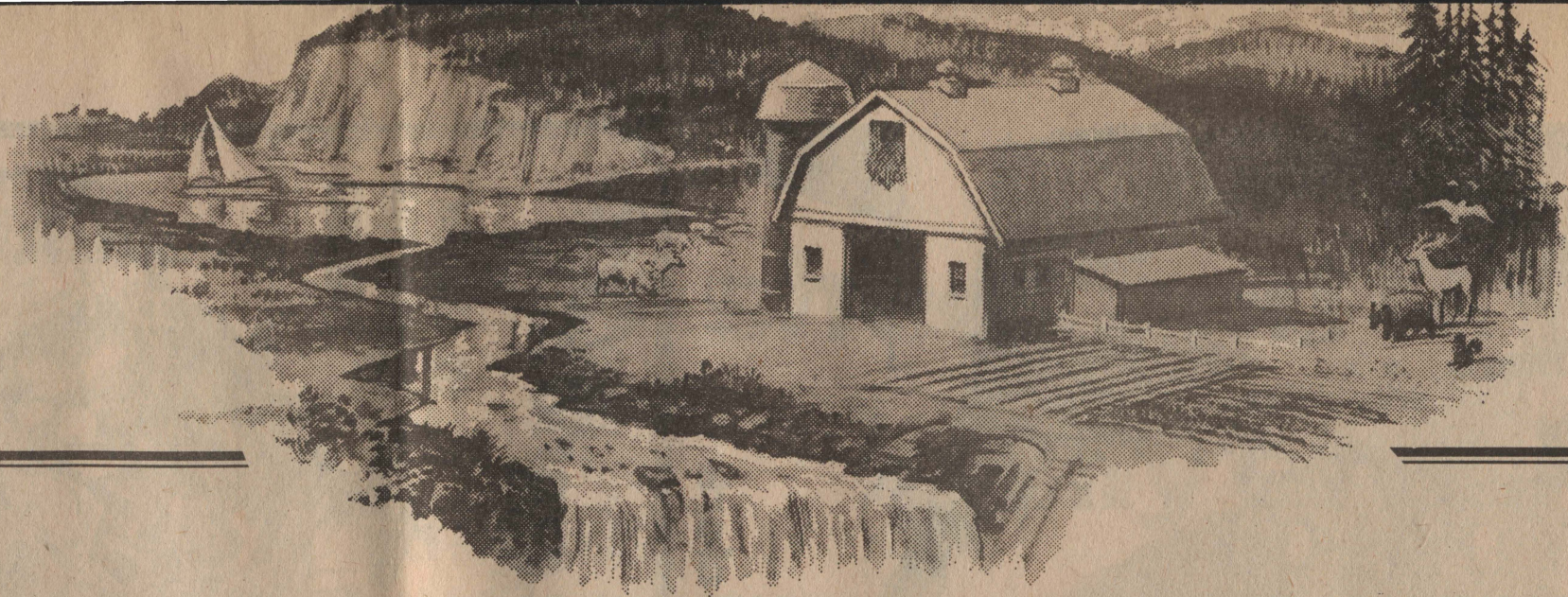
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farming efficiency

Farming efficiency

A parallel bench terrace system essentially substitutes a mechanical system of conservation farming for vegetative erosion control. The control of water should increase yields as well as reduce erosion and eliminate gullying. The level terraces of uniform width will make the use of larger equipment practical and reduce labor requirements. Maintenance of established parallel bench terraces should be less than with conventional terraces because of more adequate water distribution over the benched area and the grass cover of the backslopes.

Recent research at Iowa State University indicates that more work per unit of time is accomplished on flat land as compared with sloping land and that farming a parallel terrace

system requires less time than farming a conventional terrace system. For similar field operations, the comparisons show time savings of 5 to 34 percent for parallel terraces as compared with conventional terraces and 8 to 26 percent for flat land as compared with conventional terraces. This would indicate that parallel terraced land can be farmed with time efficiency approaching that of flat land.

One additional factor should be considered: What will be the effect of the program on the value or market price of the land? Because of the opportunity for more intensive land use and reduction of yield risks by better control and use of available rainfall, the value of the land as an investment should increase. How much no one knows, but no doubt more than the costs of installation and maintenance of the parallel bench terrace system.

The management requirement for changing a system of farming is always a challenge. The adaptation of a new system of land use to a particular farm, with the limitations of fence boundaries, the natural flow of water, building locations and just plain time-worn practices that are hard to change is never easy. But if current knowledge about parallel bench terracing is borne out by experience as it is adopted by progressive farmers, it can have a major influence on land use systems on soils that are adapted to its use.

GULLY CONTROL

In western Iowa on drainage areas with less than 100 acres, gullies can generally be controlled by level terraces. It has been demonstrated that the advance of a gully head can be completely stopped by level terraces when the drainage area is completely terraced and a "doddle dam" constructed at the head of the gully. Studies at Iowa State University shown that the rate of gully advance is

proportional to the size of the drainage area. This indicates that gully advance is related to surface runoff. As surface runoff is reduced by use of level terraces to a maximum of 0.9 inches or less per year during the cropping season, the advance of the gully head will stop—according to observation and experience. Another factor in support of the ability of terraces to store water in deep loess soils is that as benching occurs, the actual water storage capacity of terraces under good management will be increased. With well constructed terraces and good maintenance, surface runoff from terraced land could conceivably be reduced to zero in this area.

VALLEY BENCHING

Although upland areas are intensively terraced, some valley areas which often have some sloping land may remain relatively unprotected. Structures might then be located to bench the valleys as was done 20 years ago in Jones Creek, Monona County. Their justification would chiefly rest on the production of relatively level cropland in areas which were once voided by gullies. Other reasons for building structures in gullies would then be limited to furnishing recreation and farm road crossings. To some extent these latter reasons will also help determine structure location. However, it would seem that the major factor in determining structure location would be the farmability of the final benched valley area.

This information suggests that structures may possibly be moved further downstream than has been the case since gully head control can be accomplished on many sites by complete terracing. Some cases exist where the land above the overfall is too steep to be terraced. In these cases, value of the land destroyed by future gully advancement would be low and gully structures might not be justified in any case. If valleys below the overfall are of

pat achenbach . . .



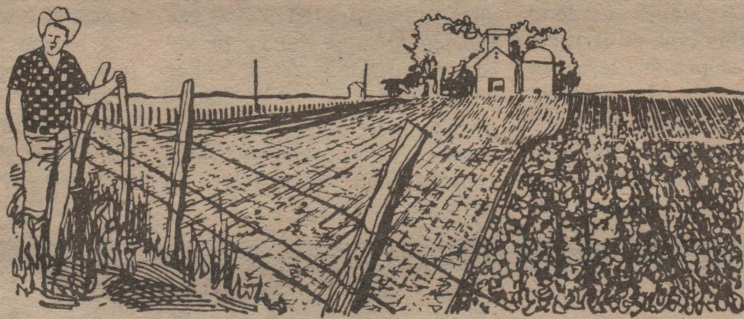
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sufficient width for farming, dams which will bench the area might still be justified further downstream. The sediment produced by the overfall advance in this case would aid in filling the downstream gully, which would speed up the process of land enhancement through valley benching. The economic justification for gully structures downstream will in these cases be based on production of cropland on sites which are presently voided by gullies.

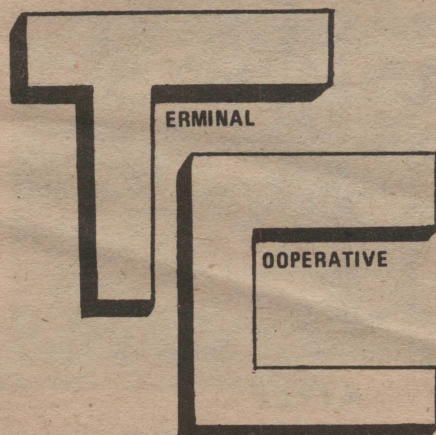


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treatments of erosion

PROBLEMS AND TREATMENTS

Research, experience and observations provide clues for improving the techniques of applying soil management and conservation practices to the land area under discussion here.

Conventional terraces

Level terraces have been used to cope with soil and water loss problems in western Iowa. For many years, terraces were laid out to conform to the exact contour of the land. Vertical spacings were quite close and the distance between terraces varied which caused many short (point) rows. With two-row farm equipment, the difficulties in farming caused by the early terrace systems were less severe.

However, four-row farm equipment has now become universal. With this larger equipment, planting and cultivating the point rows in contoured and terraced fields is more difficult. Consequently, terrace spacings have been increased along with an increase in size and width of terrace channels and of terrace ridges to better accommodate the larger machines. The need for improved terrace alignment eventually led to parallel level terraces in this soil area, which eliminate most of the point rows. Although original construction costs are higher for parallel terraces than with the older system of alignment, parallel systems are gaining wider acceptance.

Parallel level terraces achieve essentially the same control over soil and water loss as standard level terraces with fewer disadvantages. Results from a number of small watersheds in western Iowa show that soil and water losses can be effectively controlled and flood damage appreciably reduced by the use of extensive terrace systems of this type.

Parallel level terraces aid in moisture conservation. In 1956,

a dry year, corn yields in Shelby County measured 105 bushels in the channel and 41 bushels in the area between terraces. Since channels of conventional terraces occupy about 10 percent of the terraced area, this has the overall effect of increasing the yield of the field by about 6 bushels per acre. Similar results have been experienced at the Western Iowa Experimental Farm near Castana. Comparative yields at this location are given in table 2.

TABLE 2

Corn yields per acre at Western Iowa Experimental Farm, Castana.

Year	Bushels in terrace channel	Between terraces
1959	111	101
1960	93	110
1961	118	107
1962	93	99
Average 104		

These data indicate that in dry years there can be an increase in yields in the channel due to additional moisture. This is especially true with respect to the Shelby County yield. The Castana study represents years with better than average rainfall distribution. Also, in years with heavy rainfall, as indicated at Castana, there may be some reduction in yields where water is concentrated in the small channel area of conventional terraces. Since dry periods during July and August occur frequently in this area, overall yields may be enhanced by use of level terraces.

Terrace system improvements

Soil scientists have observed during the past quarter century that terraces tend to fill in or bench with time. The movement of soil by running water, the forces of gravity and the use of the one-way plow tend to create a relatively flat bench in the area between terraces. Many conservationists believe benching is inevitable. Thus, they propose that terrace ridges on slopes exceeding 8 percent be constructed mainly from the down hill side and that terrace ridge backslopes be seeded.

Several advantages accrue to the use of this type of terrace. First, land slopes are lessened by constructing the parallel level terraces mainly from the lower side. Secondly, benching can be encouraged rather than discouraged by increased in-

a grass waterway in dickinson county used as a means to minimize erosion

tensity of farming, plowing down hill and other practices which tend to flatten the farmed area into a bench. Third, moisture distribution and effectiveness becomes progressively better as the flat area develops and reaches its maximum potential when the bench is completely developed. Fourth, machinery operation is simplified and a high percentage of level or nearly level land results. Fifth, excess water is distributed over the benched area permitting more complete absorption of available rainfall, thus enhancing stored moisture supplies for crop growth and reducing flood hazards.

Intense row cropping

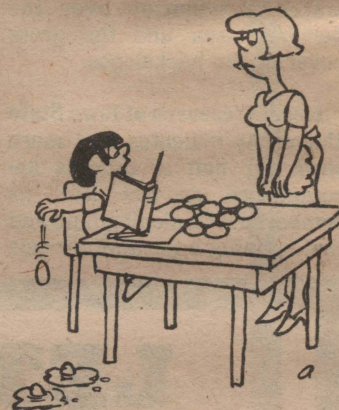
Where there is need for intensifying row crop production to maximize income from the farm business, parallel bench terraces on soils that are physically adapted to their use provide an opportunity to accomplish these ends. A higher percentage of row crops can be grown with parallel bench terraces, on suitable soils. This approach can increase income for many farmers.

The public conservation objective for the deep loess soil is to hold soil loss to an approximate annual maximum of 5 tons per acre. This objective can be accomplished by use of vegetative cover, mechanical conservation practices such as contouring and terracing, or some combination of the two.

The conventional approach to conservation farming on the Ida and Monona soils is the contouring of row crops without terraces. To reduce soil losses to 5 tons per acre annually under this approach, it is essential to maintain 50 percent of the land in grass on 8 percent slopes and up to 70 percent or more in grass on 14 percent slopes. A higher percentage of row crops can be grown with the standard terrace systems but there still are the problems of short rows and the difficulty of using modern equipment on slopes of 8 to 14 percent.

A system of parallel bench terraces appears to offer a practical and economical solution to problems of farming the steeply rolling loess soils of western Iowa. Prevention of sheet erosion, retention of

applied fertilizer after benching, satisfactory control of soil loss, better distribution of retained moisture, elimination of hillside gullying, and easier operation of modern large-scale farming equipment are among the advantages of using parallel bench terraces in this area. Added to these advantages are the possibility of more intensive use of row crops, the maintenance of higher yields and the more efficient use of fertilizer and other technology.



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WATER TABLES AND DRAINAGE

A large volume of terracing could cause water tables in valleys to build up. With heavy rains, some water may permeate below the root zone of plants. This will probably raise water tables in the valleys. If and when this raising of water tables occurs, tile should be recommended where needed to permit efficient and timely operation of machinery.

SUMMARY

The soils of the Ida-Monona and Marshall soil association areas of western Iowa are

capable of high grain and forage yields in seasons of adequate rainfall, where soil and water losses are controlled and where a high management level is maintained.

Control of soil and water losses is necessary for the prevention of excessive sheet erosion and gullying and for efficient use of the land in the farming enterprise.

Ida-Monona and Marshall soils have high water-holding capacity and in themselves, are an effective storage reservoir for water; therefore, moisture supplies stored in the soil profile during periods of excessive rainfall become available for growing crops during periods of low rainfall.

Parallel level bench terrace systems offer an opportunity for greatly enhancing the economic returns from farming in the western Iowa deep loess area by: (1) elimination of short rows; (2) reducing the land slope by creation of flat benches for farming; (3) having steep terrace ridge backslopes permanently seeded where land slopes exceed 8 percent; (4) attaining good moisture distribution over the farmed bench; (5) improved efficiency and easier operation of large-scale farming equipment; (6) more intensive use of row crops in the cropping system.

With extensive parallel bench terrace systems on the uplands, flood run-off may be greatly reduced and the need for costly flood control structures lessened.

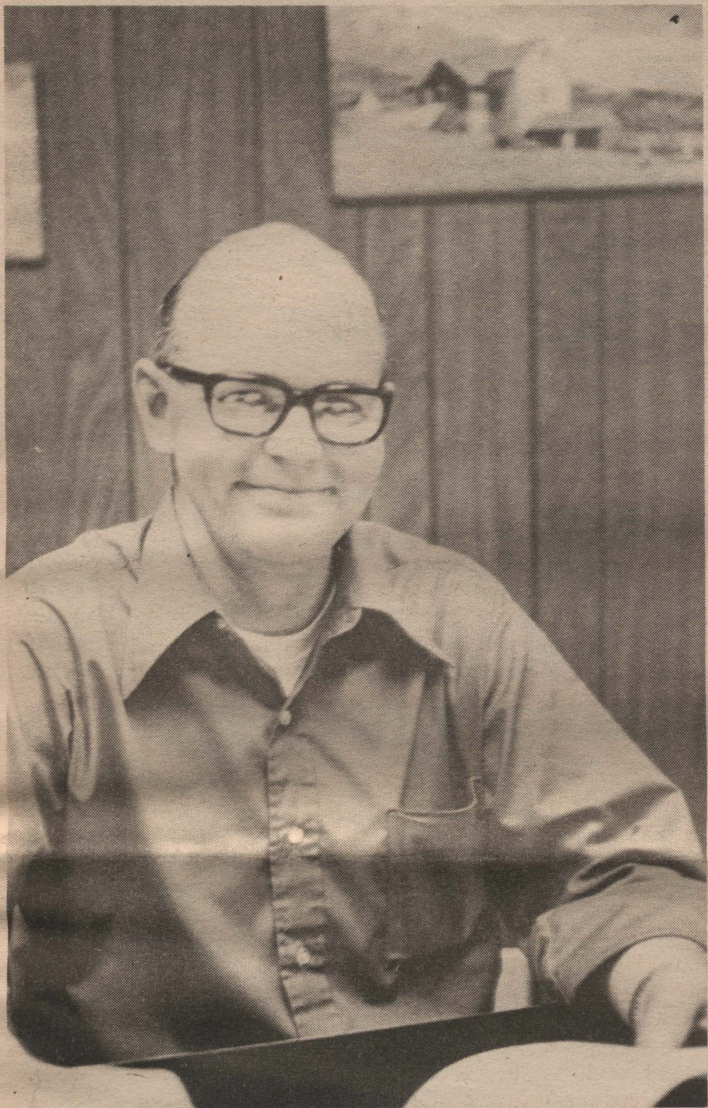
Permanent structures and tile drainage systems may eventually be designed to bench the valley floors and control water tables which otherwise might rise too high for efficient farming operations in the valleys.

Other possible uses for structures may be (1) to provide farm and road crossings, (2) to provide recreational areas, and (3) to stop gully heads where terraces cannot be effectively used for this purpose.

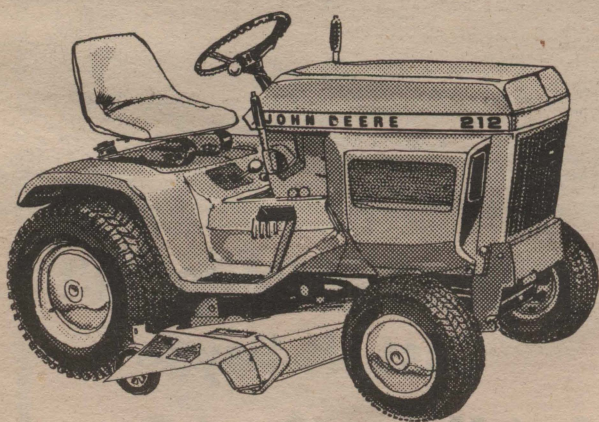
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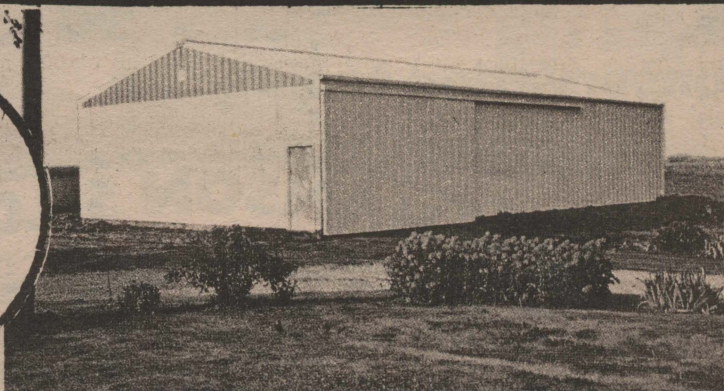
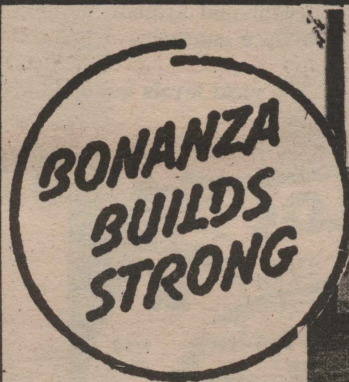


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Table 3 presents an analysis of possible returns from a parallel bench terrace system as compared to the more conventional conservation system on Monona soils with 8 percent slopes and on Ida soils with 14 percent slopes. Crop yields are estimated under the conventional system on the Monona soil at 64 bushels for corn, 50 bushels for oats and 2.5 tons for meadow. On the Ida soils with the conventional conservation system, yields of 55 bushels of corn, 35 bushels of oats and 2.5 tons of meadow were used. An above-average level of management is necessary to obtain these yields. Using the same assumptions for management, yields on both soils with the bench terracing system are estimated at 65 bushels of corn per acre of 27 bushels of soybeans per acre.

In determining the incomes, the following prices were used: corn \$1.10, soybeans \$2.35, oats \$0.60 per bushel and hay \$16.00 per ton. The costs of growing, harvesting and storing of crops are based on data from the Agricultural Economics Department of Iowa State University. Fertilizer requirements as established by Iowa State University Agronomy Department were used.

In addition, in arriving at the net income, a reduction was made in the bench terracing system for the amount of land in the backslopes that would not be farmed. On the 8 percent slopes (Monona), this reduction amounted to 12 percent and on the 14 percent slopes (Ida), it amounted to 19 percent. These backslopes would be in grass and available for grazing after corn and beans were harvested, and thus the reduction as indicated here can be somewhat discounted.

Installation cost of parallel bench terraces is based on estimates provided by the engineering section of the U.S. Soil Conservation Service in Iowa. The allowances for ACP payments are based on the 1964 payment rate in Crawford County, Iowa. The balance or net cost has been amortized over a 5-year period with an interest charge of 6 percent on the annual unamortized balance.

On the Monona soils, with an 8 percent slope, the parallel bench terrace program based on the estimate in table 3 and by writing off the costs over 5 years, returned an annual income of \$26.95 available to cover land charges and profit per acre as compared with \$18.77 for the conventional conservation system—an increase of \$8.18 per acre annually.

On the more severely sloping Ida soils (14 percent slope), where it is necessary to maintain a high level of grass crops under conventional conservation practices, the parallel bench terracing system gives even a greater return over the conventional system. Here the difference is \$23.91 income over cost for parallel bench terracing and \$9.70 for the conventional system, or \$14.21 per acre annually.

The yield levels assumed are

conservative. Recent research and experience would indicate that yield levels on these soils with superior management might be 15 to 25 percent higher than those shown. Special Report 42, "Principal Soils of Iowa," supports the assumption that higher yields on these soils are a distinct possibility at high management levels. The income from land with parallel bench terrace systems would be even more favorable at the higher yield levels.

Higher yields of crops, however, require larger

amounts of fertilizer and greater attention to other factors in crop production, such as high stand levels and weed and insect control. Costs are, therefore, increased but not out of proportion to the increased yields. It should be further pointed out that additional fertilizer will be required during the early years of the benching process while much soil movement between terraces is taking place. This added cost is not entirely reflected in the conclusions reached here.

Monona Soils (8% slope)		
	Conventional conservation (contouring)	Parallel bench terraces
Rotation.....	C,C,O,M,M,M,M	C,Sb
Gross value of crops per acre.....	\$51.13	\$67.47
Less growing, harvesting and fertilizer costs including labor.....	32.36 \$18.77	32.13 \$35.34
Less 12 percent adjustment for backslopes on parallel bench terraces.....		4.24
Income Over Costs Per Acre	\$18.77	\$31.10
Cost of installing parallel bench terraces per acre.....	\$53.55	
Less ACP payment.....	35.87	
Net cost per acre.....	\$17.68	
Amortized - 5-year period and 6 percent interest.....		4.15
Available for Land Charges and Profit Per Acre	\$18.77	\$26.95

Ida Soils (14% slope)		
	Conventional conservation (contouring)	Parallel bench terraces
Rotation.....	C,O,M,M,M,M,M	C,Sb
Gross value of crops per acre.....	\$43.64	\$67.47
Less growing, harvesting and fertilizer costs including labor.....	33.94 \$ 9.70	32.13 \$35.34
Less 19 percent adjustment for backslopes on parallel bench terraces.....		6.71
Income Over Costs Per Acre	\$ 9.70	\$28.63
Cost of installing parallel bench terraces per acre.....	\$60.45	
Less ACP payment.....	40.30	
Net cost per acre.....	\$20.15	
Amortized - 5-year period and 6 percent interest.....		4.72
Available for Land Charges and Profit Per Acre	\$ 9.70	\$23.91

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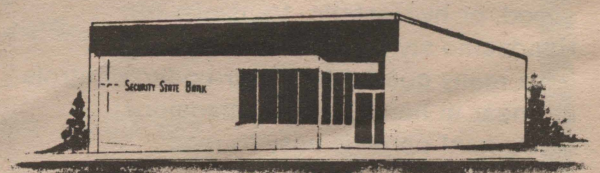
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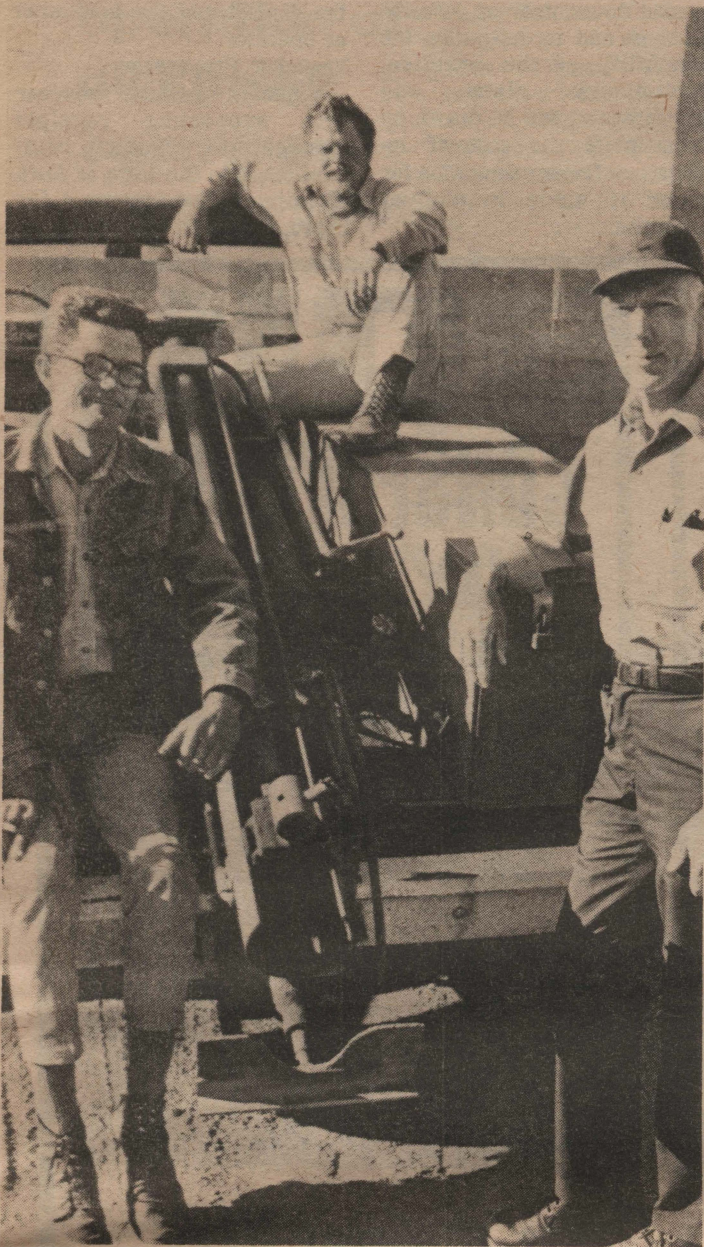


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STATE COST SHARING FOR SOIL CONSERVATION IN IOWA

All people are responsible for conservation of soil and water resources. In Iowa, 100 soil conservation districts and six conservancy districts have power to enforce these responsibilities. These districts are political subdivisions of state government.

Boundries of the soil conservation districts coincide with

county boundaries except Pottawattamie County which is divided into two soil conservation districts. Districts are governed by five locally elected commissioners and receive technical assistance from staff assigned by state or federal agencies. Each district has an office in the county seat town.

Rules for operation of the six conservancy districts are summarized in Pm-536, "Iowa's New Conservancy Districts and Soil Loss Limit Regulations."

In compliance with the Conservancy District Act, the 100 soil conservation districts adopted soil loss limit regulations for all land in their respective districts, which includes all land in the state of Iowa. These regulations, adopted after public hearings, are available for examination at appropriate soil conservation district offices.

COST SHARING

The Iowa General Assembly enacted legislation in July 1973 to provide funds to share the costs of installing permanent soil and water conservation practices on agricultural land. For each fiscal year of the 1973-75 biennium, \$1½ million has been appropriated from the general fund to the Iowa Department of Soil Conservation for this purpose. The state soil conservation committee, the governing body of the department, has determined that these cost-share funds will be allotted to soil conservation districts and that the program will be administered by the commissioners of the respective districts.

The appropriation act stipulates that not more than 50 percent of the approved cost of permanent soil conservation practices be paid from state funds, except that 5 percent of the appropriated amount (or \$75,000) may be used for cost sharing to abate complaints filed under the Conservancy District Act, in which case the

cost-share rate by statute is 75 percent. The act further stipulates that priority be given to projects on watersheds above publicly owned lakes.

ALLOCATION OF FUNDS

Cost-share funds appropriated to the Department of Soil Conservation are distributed for use in soil conservation districts in two ways:

1. The \$75,000 authorized for use in cost sharing with landowners where complaints are involved is retained in the Department of Soil Conservation. The soil conservation district must secure approval before such cost-share agreements are processed.

2. The balance of cost-share funds, except for funds reserved for special projects and contingencies, are allocated to soil conservation districts according to the relative needs for installing permanent erosion and sediment control practices.

ELIGIBILITY

Eligibility for cost-share assistance falls into these categories:

1. Any landowner or operator of agricultural or horticultural land who is or agrees to become a cooperator of a soil conservation district. In this case, conservation practices are installed under voluntary agreement. The landowner or operator is eligible to receive 50 percent of the estimated cost of the practice, or 50 percent of the actual cost of the practice, whichever is less.

2. Any landowner or operator served with an administrative order by the soil conservation district directing him to install conservation practices because of a valid complaint filed by another party. Such an individual may not be required to be a district cooperator. The landowner or operator will be entitled to receive 75 percent of the actual approved cost of installing the practice.

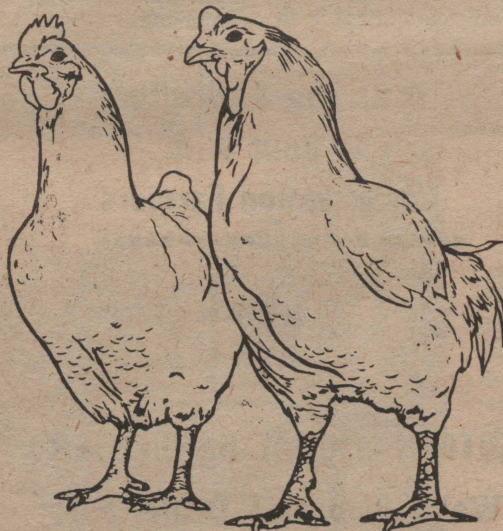
In either category, an individual wishing to secure cost-share assistance must enter into an agreement which, among other things, requires that the practice installed will be properly maintained. The agreement provides that if the practice is not maintained the cost-share funds may be reclaimed by the district.

PRACTICES ELIGIBLE FOR COST-SHARING ASSISTANCE

The state soil conservation committee has established a policy that permits the use of state cost-share funds only in conjunction with the initial establishment of needed permanent soil and water conservation practices. Only those soil conservation practices whose primary function is to control soil erosion will be eligible for cost sharing. Practices that require significant capital investment beyond the usual costs of farm operation and which, with reasonable maintenance, will remain effective over a long period of time will have priority for assistance.

Cost-share assistance under this program will be available only for permanent practices listed and described below. From this list, soil conservation district commissioners may designate the conservation practice or practices for which cost-share assistance will be made available in their district.

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county a.s.c.s. committee more on cost sharing

CONSERVATION PRACTICE SPECIFICATIONS

Specifications for soil and water conservation practices set forth in the Soil Conservation Service field office technical guide and - or the Iowa Conservation Commission technical forestry-guides for tree planting will be used as a basis for determining need and practicability and for preparing plans and specifications of practices for cost-share payment. Practice description and specification information sheets are available in the district office.

DETERMINATION OF NEED FOR PRACTICE

Cost-share funds may be used to share the costs of installing soil conservation practices only where the district's representative has inspected the site and determined that the practice is needed and is practical prior to commencement of installation. Practices will be certified as needed and practical when they are to be applied on lands suited for the designated use and where needed to support the approved cropping system. If the farmer applying for cost-share assistance has, under district agreement, developed a conservation plan for his farm and has to install proper soil and water conservation practices, and prior inspection requirement may be waived.

COSTS TO BE SHARED

All necessary costs incurred by a farmer in installing or applying an approved soil and water conservation practice may be shared. Such costs may include machine hire or for use of his own equipment, needed materials delivered to and used at the site, and labor required to install the practice. Such costs shall be itemized on a statement submitted to the soil conservation district supported by receipts of payments made to vendors, along with the farmer's statement that the practice has been properly installed. The Soil Conservation Service district conservationist

or district forester will certify as to need for and cost of such items.

MAINTENANCE OF COST-SHARED PRACTICES

Practices installed with cost-share funds are to be maintained in good operating condition to assure continued effective control of soil erosion. The application form for cost-share assistance contains a statement, undersigned by the applicant, that he will care for and maintain such practices and that should he fail to do so, the state may recover the full amount of cost-share funds paid to him for such practice installation.

PRIORITY CON- SIDERATIONS

Cost-share assistance from state funds is intended to help defray the costs of installing conservation practices needed to control erosion and prevent pollution by sediment based upon the premise that public benefits are involved. In approving applications for cost-share assistance, commissioners of soil conservation districts may give preference to the treatment of lands where control of erosion will result in

the greatest public benefit. Examples of such lands include areas adjacent to or near lakes, reservoirs, streams, highways, and other public improvements.

Policies and procedures for receiving and acting upon requests for cost-share assistance on land in watersheds above publicly owned lakes and reservoirs will be the same as for other lands in the district, except for allocation and control of funds. Funds have been reserved in the Department of Soil Conservation, and will be made available through soil conservation districts upon request for use in watersheds of the publicly owned lakes and reservoirs approved by the department for this purpose.

HOW TO PARTICIPATE IN THE STATE COST-SHARING PROGRAM Application

A party desiring cost-share assistance must file an application with the local soil conservation district indicating the practice or practices for which cost-share assistance is requested with an estimate of work involved, its cost, and date when the practice will be completed.

Determining Need and Feasibility

A district representative will check the site where the practice is to be installed to determine that the practice is needed to control an erosion problem and to determine the feasibility of the practice. Preliminary plans and specifications will be drawn up to estimate the cost of installation. Recommendation for action is made to district commissioners.

District Approval

District commissioners act on applications. When approved and signed by the commissioners, an application becomes an agreement between the district and the landowner or operator.

Voucher Preparation

Applicant submits voucher with supporting receipts through the district commissioners to the state of Iowa claiming reimbursement for appropriate cost sharing.

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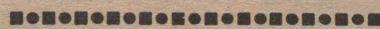
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waste management

A single steer produces about 75 pounds of manure each day. A dairy cow can produce even more.

Multiply that by 117.9 million head of dairy and beef cattle in the United States.

Add to that the waste from 18.4 million sheep and lambs, 62.9 million swine, and 900 million chickens, turkeys, and other fowl and you can get some idea of the immense amounts of animal wastes that must somehow be disposed of by American farmers and ranchers.

Much of this is recycled naturally on crop, range, and pasture land. But the growing concentration of animal production into large feedlots increases both the problem of waste disposal and the pollution potential involved in these concentrated amounts of animal wastes.

Many different people and agencies are testing new disposal and recycling methods. Our agency knows some of the answers, we are working to refine others, and we are continuing to look to the research agencies and farm and feedlot operators for new developments in this field.

The feedlot operators are well aware of the fact that they must manage their wastes to meet environmental quality standards, just as factories and

communities must. Farm waste-management systems are becoming a part of more and more soil and water conservation plans. These systems are vital to the protection of the nation's soil, water, and air, and SCS intends to continue to give assistance to conservation districts in meeting the growing demand.

Why is SCS asked for help? I think it is because of our expertise in soil science, plant materials management, and on-land application of conservation practices. We are still in the pioneering stage, but it appears that the safest thing to do with animal wastes is to recycle them through soil and its plant cover. We certainly want to prevent discharge of pollutants from feedlots or liquid-waste holding ponds into streams or underground water supplies.

While alternative methods of waste disposal, such as composting, dehydration, and incineration are technically feasible, their use in the immediate future will be limited because of high cost and limited demand for products made from animal wastes.

In providing assistance, our people will have to recognize the limits of our role in the animal-waste field. SCS is not a regulatory agency. We are a service agency, a technical agency, with a responsibility for helping land users to solve problems of soil and water conservation, including those of pollution abatement. We will have to keep in mind the need to cooperate with other federal agencies having responsibilities in this field as well as with appropriate state and local agencies. Yet, the ultimate responsibility for adhering to conservation environmental standards falls to the land owner or operator himself.

Kenneth E. Grant

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PROTECTING YOURSELF
AGAINST LOSS TIPS TO HELP YOU

This information has been supplied by experts at The Society of Chartered Property & Casualty Underwriters, the national professional society whose members have earned the CPCU designation by meeting high educational, ethical and experience requirements.

Q. My brother is thinking of switching from \$100 deductible collision coverage to \$250 deductible. I know that this will lower his premiums, but he tells me that if he ever had to pay out \$250, he could deduct it at tax time. Can he?



A. No, he can't. Going from \$100 deductible to \$250 deductible will lower his premiums, but casualty losses are no longer deductible on federal tax returns. The Bureau of Internal Revenue makes it clear that you can't deduct these losses on family cars used for pleasure rather than business.

The same applies, by the way, to damage done to your home and not covered by insurance. You can't deduct the loss from your income when figuring your taxes.

We, the commissioners of the Dickinson County Soil Conservation District wish to take this opportunity to express our sincere thanks to those who made the success of our district possible this year.

Thanks to all individuals and agencies, local, state and federal for their interest and assistance throughout the year.

We Also appreciate the help we get from the advertisers who sponsor this annual report and make it possible. We hope this report will clarify and explain some of the district programs and activities to the residents of this community.

Ernest Skow, Chairman

Bob Ingwersen

Charles Shorey

Andy Hoffman

Don Schubert

Bob Fitzpatrick, Asst. Comm.

Jim Yungclas, Asst. Comm.