

The Europe map (figure 2) shows that only narrow areas around the Mediterranean have mild humid weather in winter. Even the presence of these areas is noteworthy when it is observed that the parallel of Indianapolis extends through the center of the western Mediterranean Basin. In summer most of Europe has ideal weather from June to August and this weather is so equable that it is unnecessary to differentiate July from June and August as in North America. The relative freedom of western Europe from extreme heat is explained by its latitudes which are similar to those of Canada.

With the basic climatic zone data, other maps to fit other requirements could easily be constructed. Maps showing the distribution of dry, mild climates would be of value to those suffering from sinus. Maps showing the distribution of warm, dry climates would be of interest to those suffering from colds and rheumatism. By applying this climatic data in such ways, geographic patterns take on practical significance and change from mere academic wisdom to aids in the planning of human activities.

Soil Conservation in Action

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One of the most serious problems confronting the nation is that of soil erosion. During the past decade it is heartening to learn that farmers and other individuals are awakening rapidly to the growing menace of soil losses. In most parts of our country steps are being taken to counteract the erosion evil. Farmers, with the aid of local, state, and federal agencies are putting into operation means by which soil conservation will succeed.

The first step in establishing any soil conservation program is that of interesting the farmer in the plan and proving to him the economic validity of soil conservation practices. This first hurdle is best crossed by the actual demonstration of soil conservation procedures and the results obtained by careful farm planning.

Among the problems that need most to be demonstrated are those of water, soil and crop management.

This paper is a report of a soil saving demonstration which was held on a Vigo County, Indiana farm last September.* The farm is 160 acres in size and the physical characteristics are typical of upland farms in that part of Vigo County. The topography is rolling with slopes ranging from two to fifteen per cent. However, at least three-fourths of the farm has a slope below five per cent. The soil is silt loam, with a light grey topsoil, fine textured and medium acid in reaction. As shown in table 1, the cultivated soil has an average p.H. of 6.5, which is quite near the normal p.H. of 7. The present p.H. in the tilled fields is the result of applications of lime during the past five years.

* The farm is owned by Dr. H. M. Bratt, of Terre Haute, and is the first farm east of Riley, Indiana on the south side of State Road No. 46.

The pasture land, where no lime has been applied, has a much greater acidity (table 1).

TABLE I. Chemical Condition of the Soil in 1948 by Fields.

Field	p.H.	Phosphate	Potash
1	6.4	Low	Medium
2	6.5	Low	Medium
3	6.4	Medium	Very high
4	6.6	Low	High
5	6.6	Low	High
Pasture	5.8 or below	Very low	Low

Of the total area of the farm, 104 acres are under planned cultivation, 27 acres are in permanent pasture, 10 acres are in woodland and the remaining 19 acres are occupied by farm buildings, feed lots, poultry yards, a railroad, and roads. The arrangement of the farm, as it was on demonstration day, is clearly illustrated in figure I.

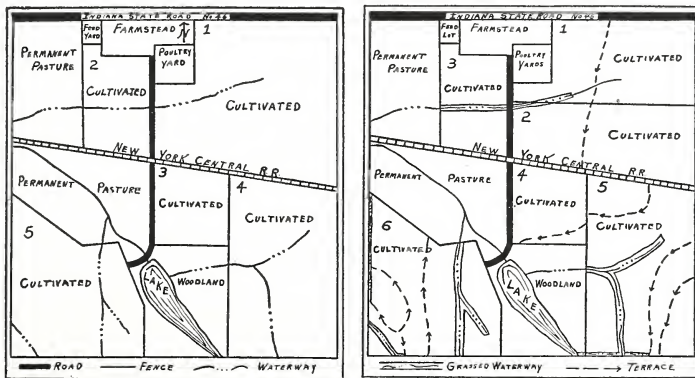


Fig. 1. The arrangement of the farm prior to Demonstration Day.

Fig. 2. The farm map with terraces located, as constructed and the location of proposed grassed waterways.

The farm has been under a planned crop and fertilizer program since 1943. During this five-year period all boundary and all cross fences have been made hog-tight. The barn has been remodeled and a concrete feeding floor constructed. The farmstead is also equipped with a running water system. Further improvements are under consideration. During the past five years, since the farm has been under the present ownership, the raising of livestock has been the primary interest. Plans call for more emphasis on livestock during the next five year period.

Losses, due to water erosion, are evident at numerous points on the farm. In field number four, figure I, a gully a foot deep and one to

two feet wide extends up the drainage way from the wood tract. It has been cut back into the field for at least 100 yards. Thin topsoil is also evident on the steep slopes in the southeast part of field four.

In field five numerous evidences of erosion are present. In the southwest corner steep slopes have aided the development of several short gullies. These gullies have impeded the use of farm machinery. On the east side of the same field a drainage way exists. Below the junction of the two drains, a wide flat bottomed runway has been eroded. The slopes of this drainage way are steep, being 10-15%. Sheet erosion is excessive here. On the day of the demonstration, this erosion was clearly seen. The light yellow soil of the steep slopes contrasted sharply with the darker soil on the bottom of the runway and adjacent uplands.

The drainage line crossing field 2 is also actively eroding a small gulley, which if left uncontrolled would soon eat its way back into field one. The wooded area is well under control because of the permanent stand of trees. The lake is artificial.

To develop a long range farm plan, the first step is that of making an inventory of the farm. This includes an analysis of the soil, measure-

TABLE II. Crop and Fertilizer History by Fields.

FIELD	1943	1944	1945	1946	1947	1948
No. 1 Crop Yield Fertilizer applied	oats 50 bu.	beans 12 bu. 200 lb. 2-12-12*	wheat 20 bu. 300 lb. 2-12-12	clover 1 ton	corn 80 bu. 1000 lb. phosphate	corn 400 lb. 3-12-12
No. 2	rye 10 bu.	clover pasture	clover pasture	corn 70 bu. 500 lb. 3-12-12	beans 26 bu. 100 lb. phosphate	wheat 30 bu.
No. 3	rye	rye 10 bu.	clover 1 ½ ton	corn 60 bu. 200 lb. 3-12-12	beans 26 bu. 1000 lb. phosphate	wheat 30 bu. 400 lb. 3-12-12
No. 4	corn 20 bu. 200 lb. 3-12-12	pasture	beans 12 bu.	wheat 12 bu. 250 lb. 3-12-12	clover 1 ½ tons	clover pasture 100 lb. phosphate
No. 5	beans 10 bu.	corn 20 bu. 400 lb. 3-12-12	beans 12 bu.	oats 15 bu.	sweet clo. pasture	sweet clo. pasture

* Proportionate parts of nitrate, phosphate and potash respectively. Each field has received 6 tons of lime during the period.

ment of steepness of slopes, extent to which erosion has taken place and the available water supply. Once the inventory has been made and carefully analyzed the conservationist is then in a position to offer plans for future farming practices. Such practices include planned crop rotations, gully control, sheet erosion control; exclude over-grazing and over-cropping. Among erosion control measures are grassed waterways, terraces, and contoured cultivation.

Crop rotation and fertilization have been followed during the past five years on the farm herewith discussed. The results are set forth clearly in table II. The table includes the rotation plan, yields, and fertilizer applied for each field on the farm. A study of the yields shows a steady increase in production, especially during the past two years.

However, continued loss of water and subsequent soil erosion, during the five year plan, were evidence that crop rotation and fertilization were insufficient for complete control. Consequently a new five year plan has been established. In addition, the building of terraces and grassed waterways are included in the new plan.

An examination of figure II and table III shows the proposed arrangement of the farm and the proposed crop rotation. It may be noted that field 1 has been divided into two parts.

TABLE III. Proposed Crop Rotation by Field 1949-1954 inclusive.

FIELD	1949	1950	1951	1952	1953	1954
No. 1	oats & alfalfa	alfalfa	corn	beans	wheat	alfalfa
No. 2	beans	wheat	alfalfa	alfalfa	corn	beans
No. 3-4	clover	corn	beans	wheat	alfalfa	alfalfa
No. 5	corn	beans	wheat	alfalfa	alfalfa	corn
No. 6	wheat	alfalfa	alfalfa	corn	beans	wheat

From table III one learns that fields 3 and 4 will be utilized for the same crop. The permanent pasture will remain as such, as will the woodland plot. All of the drainageways that cross cultivated fields will be grassed. Another sodded waterway is to be added along the south line of field 5. It will be seen that each of these grassed waterways drain into either a permanent pasture or the woodland plot, a logical and proven practice. Each of the sodded drains will check gullies now present or potential. None of the sodded drains had been constructed on demonstration day.

All of the terraces shown in fields 5 and 6 were constructed on demonstration day. Preliminary surveys and lines for these terraces had been made and drawn prior to the demonstration. The terrace across fields 1 and 2 has been in operation for a year. Since field 3 will be in red clover until 1950, table III, the construction of the terrace across it will be postponed until that year. Each terrace empties into a grassed waterway or land permanently out of cultivation. The railroad

company granted permission to drain the terrace across fields 1 and 2 into the right of way.

From the proposed crop rotation plan, table III, it is noted that alfalfa, a new crop to the farm, will play an important part in the rotation system. Alfalfa and sweet clover will be depended upon to aid materially in replenishing nitrogen, a chemical used heavily by corn. Since livestock will be the major interest, alfalfa will also furnish needed forage for winter feed.

Alfalfa is recommended over red clover on this farm chiefly because it is a deep rooted legume. Although the soil is low in phosphate, Table I, it is sweet enough to grow alfalfa successfully. Addition of phosphate and potash through commercial fertilizers will aid in securing and maintaining a good stand of alfalfa. Since in most cases wheat precedes alfalfa in the rotation, Table III, the grain will be the "nurse" crop for the legume.

All cultivated crops are heavy users of soil fertility. A seventy bushel corn crop removes about 70 pounds of nitrogen, 28 pounds of



Fig. 3. View in farmyard of Bratt farm just before field trips began.
 Fig. 4. Plowing in a terrace. Special auger moleboard plow in use.
 Fig. 5. Plowing in a terrace. Common moleboard plow in use.
 Fig. 6. A completed terrace in field 5.
 Fig. 7. A completed terrace in field 6.

phosphate, and 32 pounds of potash per acre. A twenty-five bushel soy bean yield, harvested for grain, needs 88 pounds of nitrogen, 20 pounds of phosphate and 38 pounds of potash. The bean plant of course secures much of its nitrogen from the air.

The above data means that, in order to secure satisfactory yields and at the same time maintain or improve soil fertility it will be necessary to apply some commercial fertilizer. However, whenever possible, green manure and barnyard manure should be utilized to the best advantage. That is, after all, Nature's way.

On demonstration day flat bed trailers pulled by tractors, furnished means of transportation over the farm for the visitors, figure III. During the morning, the visitors were shown the plows, in operation, building the terraces, figures IV and V.

After lunch, served by a local women's organization, those present enjoyed a chalk talk by an outstanding proponent of soil conservation. After the speech, transportation was again furnished those who desired to observe the completed terraces, figures VI and VII.

Although a farm under complete soil erosion control was not demonstrated, the project was stimulating. The results of a planned five year rotation were shown, terraces to control runoff and sheet erosion were constructed and the projected grassed waterways to control gullyng were located. The fact that over seventy-five percent of those present returned to the fields in the afternoon for a second look revealed their interest. It is believed that the demonstration will lead the way toward the formation of a Soil Conservation District in Vigo and adjacent counties.