

associated with its widespread cloudiness and precipitation when it is parallel to the isobars at 10,000 feet. Cloudiness and precipitation will persist far behind the front because isobars "aloft" are parallel to the surface front; further, waves will form along such a cold front. (Cold occlusions behave in a similar manner.) Thus, cold or cold occluded fronts appearing on the West Coast during the period May 10 to June 15, entered a region in which they would be active; normally such fronts would be weakened as they entered the area.

In northern Idaho and western Montana there was another rainy period, in addition to the two mentioned before. The seventh and eighth of May produced the greatest amount of precipitation for a 24-hour period for many of the stations. The Kootenai River began a very rapid rise on the eighteenth of May at Leonia. The same is true of the Blackfoot River near Darby, Montana; the Middle Fork Flathead River at Essex; the Payette River, and the whole length of the Salmon River. The Clearwater River at Spalding similarly responded and also the Snake River at Clarkston, Washington.

Several of these streams reached their peak discharge before the end of May, especially the Kootenai, the Clark Fork, the Blackfoot, the Bitterroot, the Middle Fork Flathead River, the Clearwater, and the Snake. All of these streams are on the east side of the main stem of the Columbia. On the west side, the Wenatchee and the Yakima reached their peaks between May 29 (the Wenatchee at Peshastin) and May 31 (Yakima at Kiona). These and other tributaries brought the Columbia to the high crest at The Dalles and Portland on the thirty-first, a height which did not materially diminish for the next two weeks.

#### CONCLUSION

THE COMBINATION of events that produced the 1948 flood in summary is as follows: (1) There was more than normal snow by April 1, at which time the snow above 3000 feet should have begun to diminish; (2) April was cold and wet, with the accumulation of snow continuing; (3) The first half of May was cold and rainy, which prevented normal melting of snow and kept the soil saturated at altitudes where there was no snow; (4) Just after the middle of May a deep flow of warm, saturated air invaded the western states with convergence and lifting occurring to above 20,000 feet—excessive precipitation on ripe, well-channeled, and saturated snow resulted; (5) The same condition occurred again ten days later; (6) The first ten days of June were very warm; this produced enough melt-water to maintain an even, high discharge rate of the tributaries of the Columbia.

Will this combination of conditions repeat itself? Without hesitation, the answer is in the affirmative.



### *Contour Strip Cropping*

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AFTER SIX YEARS of studying contour strip cropping in the Lewiston-Moscow area it is evident that this method saves soil, moisture, and fertility; it is the fastest, cheapest, and best way of farming; and, in short, it means more soil on the hills, and more money in the pocket of the farmer. There are several reasons for making such a statement. In the Genesee and Lewiston areas we have several good farmers who have been following fairly good conservation rotations and the use of crop residues for a number of years. On these farms we still find erosion. True, it is far less than their neighbors', but it is still excessive. The erosion is due to two chief reasons. One is the moist condition of the soil after sweet-clover fallow and the other is the excessively heavy storms on freshly prepared seedbeds, or excessive fall and winter moisture. These conditions do not occur every year; however, they do occur at frequent intervals and require further steps to reduce soil loss.

There are three ways of strengthening the erosion control program now employed on most farms: (1) Retire the land to a permanent cover of legumes and grasses. On steep land, retirement seems to be the only practical way. (2) Give more protection to the land by a system of field diversion. Diversions are expensive and hard to construct and maintain on the steep, rough topography of the Palouse country. (3) Apparently the most practical solution—contour cultivation and strip cropping. Under this method, the land is broken up into strips across the slope so that only a small portion of any hill is open to erosion at any one time.

### PALOUSE COUNTRY PROBLEMS

THE PALOUSE COUNTRY offers problems that are somewhat different from those of other places. We have about as steep and rough a topography as man has ever tried to farm. However, the steeper and rougher the land becomes, the greater are the advantages of strip cropping and contour cultivation: more time and effort in farm operations can be saved by practicing contour cultivation, and strip cropping on the contour will save more soil.

Any rotation can be made to work very nicely with strip cropping. Wheat fallow rotation can be made to work very well. A rotation of wheat, peas, barley, and clover will work very nicely. In fact, any given rotation will work. It is only on the farms where the farmer has no idea what he will raise from one year to the next, that contour strip cropping will not fit. Contour cultivation will fit in this latter instance.

Contour strip cropping will work well with our present equipment, but some of the new equipment now being introduced will work even better, such as the self-propelled combine, sweeps, and two-way discs.

The question of fencing for rotational pasture is one that is definitely worth considering. Some permanent fences, as well as temporary (electric) fences, can be placed to allow pasturing. Water developments will also need to be placed in strategic locations, if livestock are to be maintained on the farm.

### DISADVANTAGES OF CONTOUR STRIP CROPPING

FENCING FOR ROTATIONAL PASTURE is very definitely a disadvantage. It is much easier to fence a square field than a long, narrow field. However, the livestock farmer usually has a better rotation of alfalfa and grass, and in a number of farms it is possible to plan most of the rotational pasture on a portion of the farm, and strip crop the remainder. On all land, all farming operations can, and should be, on the contour.

Contour strip cropping is a new practice, and all new practices require a lot of thought and planning. All existing field boundaries must be abandoned. The problem of changing a crop rotation on big fields to a crop rotation on contour strip cropping frequently becomes complicated. It is far easier to change from wheat and fallow rotation to a strip crop rotation than it is from a wheat, pea, sweet clover and grass, and barley rotation to a similar rotation on strips.

Strip cropping means more fields. On the farm operated by Marion Holben near Genesee, Idaho, it increased the number of fields from 5 to 35. Mr. Holben says that this is not a disadvantage, for under his new system, it is easier to get his spring work done between rains.

Strip cropping means more back-swash, definitely a disadvantage. This is more serious on the level farms than on the steeper farms. Offsetting this, however, is the fact that on the more level farms there are self-propelled combines. The steep-hill farms have a large amount of back-swashing now to open up the field to be combined, and strip cropping does not increase it materially.

On the Holben farm, which has fairly smooth slopes, the amount of acres in back-swash was doubled. On my farm at Endicott, Washington, which is on fairly steep ground, the increased back-swash only amounted to about one-fourth of one per cent of the total farm land.

### ADVANTAGES OF CONTOUR STRIP CROPPING

THE GREATEST ADVANTAGE of contour strip cropping is its saving of soil, moisture, and fertility. When we have a field that is saturated, or a field that has a puddled surface condition that encourages runoff, we start to lose water. Along with the water goes soil and fertility. If the slope is long, this movement of water down the slope increases greatly in volume until it reaches serious proportions. If we place a barrier in the path of the water before the movement becomes serious, the losses can often be kept to a minimum. For instance, if we have a dry winter wheat, fall-tilled field, or a strip immediately below a strip of sweet-clover fallow, the moisture and fertility losses from the sweet-clover fallow can frequently be stopped and held in the stubble land. This is as much true of subsurface movement of moisture as of surface movement. Another advantage of strip cropping is that it is a permanent guideline for contour cultivation. The mere fact that we have marks in the surface soil on the level may mean the difference between erosion and no erosion.

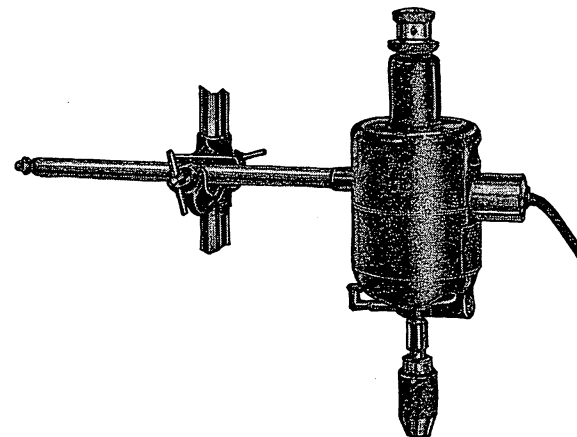
Contour farming is the fastest, cheapest, easiest, and best method of farming any piece of land. Several fields were checked for time and performance of a given tractor on contour operation against previous around-the-field method; contour cultivation has always shown the best results. Farmers have stated that it saves them considerable time. All the farmers questioned say that it is the easiest way to work the land; there is practically no shifting of gears. A number of farmers claim that they do a better job of cultivation than they did before.

In short, the farmers who have tried contour strip cropping like it. The greatest advantage from an equipment operation standpoint is the saving in the hill climbing. The number of trips uphill can be definitely reduced. This reduction, of course, depends on the farm. A fairly flat farm may not save a great deal in the amount of hill, but the steeper the farm becomes, the greater the saving. On one farm near Moscow, Idaho, hills for a 14-foot combine were reduced from a total of 16,200 feet to about 1400 feet, or a saving of 86 per cent. On the Holben farm near Genesee, the saving in hills amounted to about 85 per cent.

Contour cultivation means more short rows. This is definitely a fact. It also means more long rows. The number of turns that are required for contour cultivation, or strip cropping, is not a great deal more, if any, than for more common methods of farming; for some farms it means more, and for others less. The difference is very seldom more than 5 per cent.

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