Cutting Labor Corners

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PRODUCE more in 1942 than ever before and do it with less labor and a reduced supply of equipment.

That, in brief, is the challenge thrown out to Iowa farmers as their contribution to the Nation's war effort.

The war has already taken a good many young farmers and farm laborers; more will go into service. Still others are working in factories making airplanes, ammunition and other material concerned with the execution of the war.

The Nation's factory facilities are being directed as fully as possible to the production of war equipment, and this has resulted in a shortened supply of farm equipment.

And so the situation is bad with little hope of it getting better until we have won the war.

Increased production with reduced labor can be had only by increasing the length of working hours or by increasing the efficiency of labor, power and machinery.

Many Iowa farmers are now working as many hours per day as they can. It will be difficult for any farmer practicing diversified agriculture to increase appreciably the number of hours he works. The alternative, then, is to consider greater economies in the use of power and machinery.

About 60 percent of the cost of production is attributed to labor, power and equipment even in normal times. But the number of hours of man labor and horsepower required to produce a crop varies widely on Iowa farms. Much of this variation is the result of difference in topography, though some variation is the result of the combination of labor, power and machinery the farmer uses.

To make man labor go farther in field work often requires using larger equipment, or combining two or more implements and pulling them with increased horse or tractor power. The man on the small farm, especially, may find it to his advantage to cooperate with neighbors in purchasing larger equipment and in doubling up on teams to operate it.

There will undoubtedly be more exchanging of machines between neighbors—especially the more costly machines—so that each machine may be used more nearly the full amount of time that it might be operated. Furthermore, farmers who own the larger implements may do the work for several neighbors as well as their own to the advantage of all. Several instances of this kind have been reported in Iowa this spring.

Farmers with general-purpose type tractors use considerably fewer total hours of man labor for growing an acre of corn than other farmers with standard tractors or those who use horses. This was shown in a survey made in Iowa and Pocahontas counties by John A. Hopkins, Jr., of the Iowa Station, in the National Research Project Survey. The man hours used with a general purpose two-plow tractor were 4.9 hours per acre; 7.4 hours for two-plow standard tractor farms; 6.1 hours for three-plow standard tractor farms and 9.3 hours for horse farms.

The difficulty with the standard tractor is that it is economically impractical for the row-crop grower, since it necessitates keeping enough horses to plant and cultivate the crop.

The general-purpose tractor, on the other hand, is very efficient in the use of man labor. Only about half as many man hours are required with the general-purpose tractor as with horses.

An analysis of the records of members of the Iowa farm business associations made in 1939 by Wylie D. Goodsell of the Iowa Station showed that farmers with different types of equipment varied from 6 to 15 minutes per bushel to grow and harvest each bushel of corn.

Despite Labor Shortage, Iowa Farmers are Asked to Produce More Than Ever Before
C. K. Shedd, E. V. Collins and J. B. Davidson of the Iowa Station in an experiment in 1939 under favorable conditions, with corn yielding 85.8 bushels to the acre, grew and harvested the corn with an expenditure of 2.7 minutes to the bushel, or about half that of the lowest figure in the farm business associations. That record can be duplicated by farmers under favorable conditions using similar equipment.

Here is what the investigations we have carried on at the Iowa Station, in cooperation with the Bureau of Agricultural Chemistry and Engineering of the United States Department of Agriculture, have shown:

1. A tandem-disk harrow is more effective than a single-disk harrow in filling up tractor wheel tracks and leveling off other irregularities in the soil surface.

2. One tillage of plowed ground with a tandem-disk harrow and spike-tooth harrow just before planting is generally sufficient preparation of the seedbed. Additional tillage—such as disking the ground at various times before the final seedbed preparation—did not improve the weed control, stand or yield of the corn.

3. One tillage with a single-disk harrow or with a field cultivator is not sufficient seedbed preparation.

4. For lighter operations and final preparation of the seedbed, the spike-tooth harrow is preferable to other machines, except for spring plowing when a rotary hoe section is attached to the plow.
5. Early cultivation with a spike-tooth harrow, spring-tooth weeder or rotary hoe is effective in killing small weeds when the soil has been lightly crusted by a moderate rainfall. Labor and power requirements in using these machines are low.

6. Early cultivation with a sweep cultivator after the corn is large enough for thorough covering of the weeds in the corn row will destroy practically all weeds.

7. Early cultivation was omitted in an experiment through a 6-year period without causing any reduction in yield except in one year when wet weather prevented later cultivation at the proper time.

8. Sweeps do a better job of cultivating than shovels. Disk hillers are the most effective equipment for covering weeds in the corn row.

9. An experimental spring-tooth weeder rear attachment for a tractor cultivator effectively finished the kill of weeds and leveled the soil between corn rows.

10. Good control of weeds can be had in drill-planted corn without any excessive ridging of rows by using sweeps, disk hillers and a spring-tooth weeder rear attachment.

11. It takes less labor and power with the lister method of culture, but yields are not so good as with the surface-planter method here in central Iowa.

Practically speaking, the only reason for cultivating corn is to kill weeds. If there are no weeds, then there is no need of cultivating. The theory once generally accepted that it is necessary to maintain a good dust mulch on the surface in order to prevent the loss of moisture has been thoroughly disproved.

Most farmers do not cultivate corn too much, but some are expending more labor on corn cultivation than the results obtained justify. Seldom is there any reason for cultivating more than three times.

Iowa farmers generally are convinced that shallow cultivation is better than deep cultivation for corn. Some farmers, however, are reducing yields, at the cost of more power, by cultivating too deeply.

Soybean cultivation competes for time with corn cultivation. Those who are growing soybeans can hold down labor in cultivating the beans by preparing a good seedbed, as one would prepare it for corn, harrowing it just before the beans are planted. The ground may then be harrowed again just before the beans are up, when they are about 3 inches high and again when about 6 inches high.
The use of the harrow will enable covering much more ground in a given amount of time, thus greatly reducing the man labor needed for soybean cultivation.

Livestock Problems

Since we cannot cover all of the possibilities of saving labor, this article is intended to deal mostly with crop production and corn in particular. But here are a few suggestions about possible short-cuts with livestock and poultry that you may or may not already have put into practice. These suggestions are offered by members of the Extension and Station staff of Iowa State College.

The one big labor saver on the dairy farm is the milking machine. Tests at the Iowa Station have shown that one man with a machine can replace about two and one-half hand milkers—he can cut the time for milking in half. Although farmers are urged now to keep cows that normally would not be considered good enough producers to stay in the herd, shortage of labor for dairy farmers may become so acute as to make it necessary to sell off the poorer cows in order to properly care for the better ones.

With hogs, the one big labor-saving procedure is to use self-feeders. In the use of self-feeders, one should watch to see that they are letting the feed down properly and are kept filled. Automatic waterers are another labor saver.

Pushing hogs along with a well-balanced ration is one means of saving labor, for that gets the hogs ready for market sooner. It's a real labor saver if the hogs are ready for market at 6 months rather than at 7, 8 or 10 months of age.

The cattle feeder who is feeding out cattle on grass can with equally good results full-feed his cattle once a day rather than following the usual practice of feeding twice a day. Tests at the Wisconsin Station have shown this to be true.

One possible saving with poultry is to provide feed storage space in the hen house for 2 to 4 weeks feeding. Having water piped to the hen house will save labor too.

With young chicks, use as large feeders as possible so that they need be filled less frequently than smaller feeders. Market springs can be got ready for sale in a much shorter period by confining them to the brooder house and pen until they are marketed.

Large capacity range feeders for pullets on range save labor, as do large waterers. If barrels cannot be obtained, waterers can be made in the shape of troughs with reels over them similar to those used on feeders. Providing storage facilities on the range for grain, mash and water will greatly save time in tending the growing chicks.

Many farm people have undoubtedly been studying this labor problem seriously and have thought of many means of saving labor, but perhaps some of the suggestions offered here will help a bit.

**Corn Cultivation Speed**

It's a temptation to speed up in cultivating corn with the row-crop tractors, but tests carried on at the Agricultural Engineering Farm of Iowa State College show that at 5 to 6 miles per hour, the job of killing weeds is likely to be poorer than at a slower speed.

In the tests made by the agricultural engineers, they found that a speed of about 2½ to 4 miles per hour was approximately best from the standpoint of doing a good job of cultivation.

It is true that the cultivator can be adjusted to do a fairly good job of getting the weeds at the high speeds, but it is necessary to slow down in turning at the ends and there the fields are apt to be weedy if high speeds are used.

This cultivator at the left below was effective in destroying weeds and lends itself very well to contour cultivation. The front pair of disk hillers cut close to the corn row, throwing the soil away from the row. Leaf guards prevent injury of the corn plants. A second pair of disk hillers throws soil into the corn row to cover weeds. Scrapers on these disks turn the soil into the row before it's lifted high enough to cover corn plants. Sweeps behind the disks cultivate the remaining space between rows. Right (below): An experimental spring-tooth weed er rear attachment for tractor cultivator found effective in finishing kill of weeds and leveling soil between rows.