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ENGINEERING IN THE FARM CALENDAR

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A better title might be "Engineering in Farm Management." This is written from the viewpoint of the farm operator. What processes in farm operation may be classified as engineering? How may these jobs be best distributed through the year? Most farm operators wish to make the best use of their own time and that of their men, power, and machinery by doing given jobs of engineering character at the most advantageous time. Our subject is developed under these heads: building construction and maintenance; power and machinery; land reclamation (irrigation, drainage, stump and stone removal).

BUILDING CONSTRUCTION AND MAINTENANCE

The farmer builds in the spring, summer and fall for he lacks the commercial incentive and the equipment needed for the more expensive winter construction. More than new structures are involved. We may erect major farm structures only once in a lifetime, but we repair annually. Among other things construction includes farm fences. Formerly this was a spring job, between seeding and haying, when the ground was moist. But the electric fence, the steel post, and the rotation pasture have changed all that. Internal farm fencing has become an all-season affair. We do much more fencing with much less work than formerly. The practice of "flexible fencing" has been developed by the engineer, and the farmer's labor load has been immensely eased and spread.

Outside painting is a major maintenance job with wooden buildings. Since it is best done in warm dry weather it is normally a midsummer job so as to escape the dampness and chill of spring and fall. But the heavy labor load of harvest comes in midsummer so that the painting job usually shifts both ways. Other external repairs such as shingling, siding and construction of minor shelters must often wait until fall, for, by that time the farmer's labor load is eased and the harvest is done. In his leisure he instinctively checks his shelters for both family and livestock before the arrival of winter's cold. He usually delays the strictly internal repairs such as making

new floors of wood or cement, inside painting, installing new barn equipment, wiring, and miscellaneous jobs until winter comes, when the chore men must be kept busy through midday.

POWER AND MACHINERY

This is still discussed from the viewpoint of the farm manager. Power may include animal as well as mechanical power, and machinery is a broad term running all the way from hand tools to combines. Use of some farm machines such as the grain binder and grain drill is essentially seasonal. Other types of machines such as the tractor, the feed grinder or the hay baler are in use all season. It is wise to plan at all times to keep the men, power units, and farm machinery as busy as possible through the year. This objective is realized as nearly as possible by fencing, hauling stones, grinding feed, crushing rock, or building roads on wet days of summer and operating the stone crusher, sawing wood, and hauling out manure daily during the winter months. These operations tend to distribute the labor load more evenly, conserve the valuable days of early spring, and raise the daily average of hours of productive service of men, horses, and machines.

The post-holiday season should be one of the active periods of the year in a restricted sense. All the machinery should be gone over; taken apart and cleaned, worn parts replaced (including those that may be the cause of serious loss of time during haying), and the whole thoroughly greased and reassembled. Harnesses should be renovated, wagons and sleds painted, and minor supplies (such little things as rivets, bolts, washers, eveners and nails) assembled. With such care machines are often in good working order after 25 years of service. The annual bill for new equipment also is kept down, and many of the worries and delays incident to summer breakdowns in the field are avoided. In fact, failure to capitalize the comparatively idle time of winter is one of the big management leaks on many farms.

LAND RECLAMATION

Irrigation is a new term and new practice in our state. Its application is limited to a special field. Provision need not as

yet be made for it on the labor chart of the average farm. Its importance, however, is growing. Where its need is recognized it must be planned and installed well in advance of its use if it is to be effective. The sufficiency of water supply is the first essential.

Apart from irrigation, land reclamation covers two fields of engineering: drainage and land clearing (stump and stone land reclamation).

Frost and water inhibit drainage operations with us in early spring, harvest absorbs midsummer labor, and frost penetration is too rapid in winter, so drainage work should be done in the late summer and fall after harvest and before the onset of winter. These suggestions refer to the smaller projects where the farmer does his own work. Midsummer work, of course, would continue on a big installation or contract job.

There are four processes in land clearing: (1) removal of overburden of brush and timber, (2) stumping, (3) breaking, and (4) stoning. The first job fits well into the farm labor calendar of fall, winter, and early spring. The leaves have fallen, the vision is good, the ground is frozen so footing is secure, there are no mosquitoes, weather is stimulating, and, if snow does not hinder, it is a job one can do when little else can be done out of doors. Most of our stumping is done in October for the very good reason that farm work has been completed and there yet remains time for doing an extra job. A better time for that, however, is in the spring between seeding and haying. The ground is soft with emerging frost, and stumps come out more easily. There is the added advantage of a possible crop the same year.

Breaking and stoning go together. It is said that June breaking is best, but often breaking must be done when and as possible. Stoning both precedes and follows breaking, but both operations must await the passage of the stumps. The most satisfactory sequence—known as "delayed clearing"—is to brush and log some years in advance, pasture, break and stone in late summer for late fall or early spring seeding.