Twine Production the Source of Supply

Chicago Twine Factories Alone Can Yearly Produce Enough Binder Twine to Harvest Seventy-Three Million Acres of Grain

(The Christian Science Monitor)

A BALL of twine, hidden away on the inside of a great harvesting machine, is certainly an inconspicuous thing, and few would realize, who are not themselves makers or users of agricultural machinery, that on the uniform size and tensile strength of the twine depends the smooth operation of the harvester, and hence, ultimately, in a great degree, the bread supply of the world. The binding attachment, added to the reaper, transformed it into a "harvester" in the fullest sense, and the humble twine, which superseded wire in the binding of grain may be said to be the crowning adjunct of that greatest of labor-saving inventions, the harvester, as it is known today. If no harvesting machines were manufactured for a whole year, the farming community would, undoubtedly, be put to some inconvenience, but would manage to get along with no serious loss. On the other hand, if the supply of twine for one harvest were suddenly to be cut off, it would mean not simply a national, but an international, calamity, as it would be impossible to obtain help enough to gather the crops.

The hunt for the ball of twine that would work in the harvester was a long one. One manufacturer tried to make twine out of grass. It cost him $15,000 to find out that it would not work. Then he tried to make a paper twine, and spent $35,000 before he gave it up. Next he tried straw as a raw material — and the attempt cost him an additional $43,000.

* * *

Eventually the problem was solved by two foreign fibers — manila and sisal — but another company still thought they could find a home product. Home-grown flax seemed to fill all requirements, and the company spent $1,000,000 in perfecting the process of turning it into twine. Then, when it was carried into the field and tied around the bundles of grain, it was discovered that crickets and grasshoppers like nothing quite so well. These two insects promptly ate the twine and the bundles fell to pieces out in the fields. An industry that has grown to the grand total of $50,000,000 in the last 40 years was at stake.

One of the men kept awake at night by these problems was William Deering, whose harvester was interested in twine. By chance one day he untwisted a manila rope, and the thought flashed upon him that manila would make good twine if the strands could be spun small enough. The problem was laid before one of the biggest rope manufacturers in the country, and promptly turned down. Another manufacturer of ropes thought he could do it, only his machines made but 300 feet to the pound, whereas it was necessary to have it 700 feet to the pound. The machines were rebuilt, however, and the desired twine produced.

It was soon discovered, however, that while the manila fiber makes a beautiful twine, the expense was too great a handicap, so far as cheap twine for use in the wheat field was oncerned. So it became necessary to look about for a more economical fiber.

* * *

Yucatan solved the last step of the problem. A plant of the agave tribe, known to us only as a foliage plant, can be grown in great abundance in a small section just above sea-level — almost a solid ledge of limestone rock. It yields a fiber known as sisal, and today sisal produces from 85 to 90 per cent of the binder twine used throughout the world. The plant is known in Yucatan as henequen.

The henequen plant looks something like a century plant, whith a low core, and stiff pulp leaves standing up around it, considerably higher than a man's head when it reaches maturity, which takes about seven years. A plant yields from 12 to 20 leaves which the natives cut with sickle-shaped knives from the mature plants, and such is the climate that they can continue cutting all the year around. The leaves average a little less than two pounds in weight. Uusually from 3 to 3½ per cent of marketable fiber, or about one ounce, is obtained from an average leaf, making an average perhaps of one pound from each plant, or 1000 pounds an acre. This is the result of a year's operations.

Each leaf is handled individually, being first cut from the plant, then the spines removed from the edge of the leaf, then the leaves packed in bundles of about 50 and carried to the nearest tramway. From there they are conveyed to the cleaning plant, which is centrally located on each plantation, and run through a decorticating machine. This machine, as its name implies, takes off the hard cortex of the leaves, and reveals inside a pulpy substance through which runs the all-important fiber from which twine is made.

The fiber which comes from the decorticator is carried into the drying yards and is spread on galvanized wire, where it dries and bleaches in the sun, after which it is gathered and taken into the warehouse, where it is pressed into bales in the same form in which it finally reaches the mills. From Yucatan the bales are conveyed by boat across the Gulf of Mexico to New Orleans, Mobile or some port in Texas. From these points it is trans-shipped up the Miss'ssippi River to Cairo, at the southern tip of Illinois, but comes into Chicago aboard railway trains.

* * *

Chicago, the world's center for agricultural machinery, has very naturally become the world's greatest producer of binder twine. Here are the two largest binder twine factories in the world, having a capacity of 110,000 tons a year. A few additional figures will serve to visualize this capacity. It takes approximately two feet of binder twine to bind the average-sized bundle of grain, and the harvester averages 750 pound bundles to the acre. There are 500 feet of binder twine to a pound. Reducing Chicago's potential 110,000 tons to pounds, we get 220,000,000 pounds, which would bind 55,000,000,000 bundles, help to harvest more than 73,000,000 acres of grain, or girdle the globe 833 times.

The trains which bear the sisal fiber bales to Chicago unload directly in the factory, at the rate of 800 or 900 bales a day, or more, and we see great walls of these fiber plants piled up in the storage room. They are taken, as needed, to the opening department where men split them up and release the closely packed fiber, mixing together various grades of hemp which is put through a "spreading machine" to further prepare it. After inspection, sorting and spreading the fiber is put into big box trucks and trundied away to be prepared for spinning into twine.

As good twine is made of a mingling of coarse with thin fiber, each man has four bales to work from, graded to give the desired thickness and texture. On the first machine employed, a combing machine, there is a scale, and as the fiber passes through it, at intervals a bell rings indicating a certain weight a foot for that particular lot of fiber. The appropriateness of the name "combing machine" in connection with the fiber is apparent to the eye of the most uninitiated, for the long ribbons of fiber as they pass into the machine look like nothing so much as hair; long, luxuriant, if decidedly coarse hair, with a slight wave in it, due to the compression of the bales. The difference between combing fiber for twine and combing one's head is that in addition to separating it into paralled lines and straightening out tangles, the fiber-combing machine pulls it out to a greater length.

This pulling or drawing out of the fiber is accomplished not by stretching it but by combing it with revolving cylinders, armed with teeth, some of which cylinders revolve faster than others, so that the layers which they pull will necessarily be pulled out farther than the first ones, and the whole mass of fiber will be thinner and longer than when it went into the machine.

The action of the next two machines through which the fiber passes is still further to break up the fiber into smaller and smaller ribbons until at last each ribbon begins to look quite slender as it runs out of the machine into revolving cans at the ends, and these slender ribbons are called "sliver" by the workmen. When at last the "finishing machine" spouts out its contents, one can tell by taking up one of the ribbons of "sliver" that it has diminished in thickness to almost the feeling of a piece of thick string, and this is the point at which it is ready for spinning into twine.

The spinning room is a wonderful sight, with its long rows of spindles, two to a machine, working horizontally, but controlled by bolts from above. As the