THE STORY OF TWINE

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INTERNATIONAL HARVESTER COMPANY OF AMERICA

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Trieste

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INTRODUCTORY

More than 150,000 tons of twine are required annually to bind the grain crops of the world.

Sisal Fibre, from which sisal and standard twines are made, is grown in Yucatan, Mexico, where it is carefully cultivated by up-to-date plantation owners. Modern machines are used to remove the fibre from the leaves, and every effort is made to retain the smoothness and strength of the natural fibre.

Manila Fibre is grown in the Philippine Islands; the fibre has a lustrous sheen, somewhat similar to wheat straw. The lower the grade, the darker the color. When manufactured into twine, the oil that is added gives a slightly darker tint.

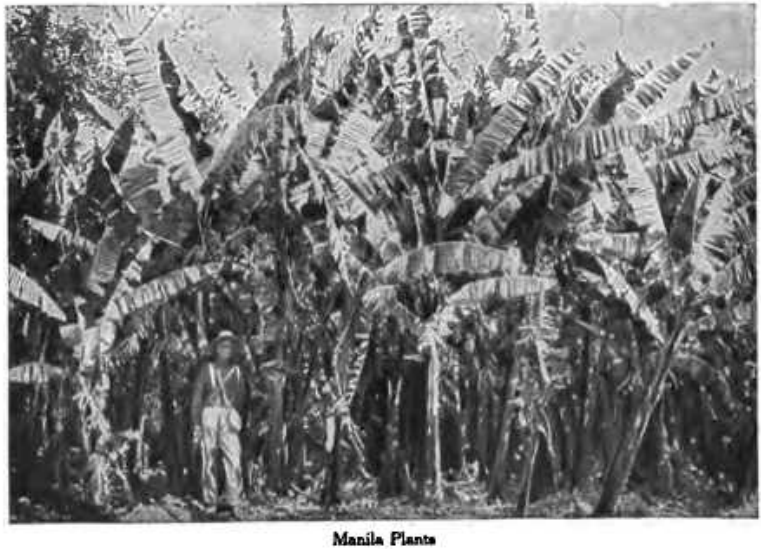
The manufacturers of twine maintain a corps of expert inspectors in the field and a second corps in the mills, where the twines are made, and in this way the inferior fibre is detected and thrown out. During the busy rush of harvest it is very important that the twine shall neither knot nor break in the field, and that it be full length and have uniform tensile strength.

tive forefathers in extracting the fibre. It was soon seen that sisal would either be the ultimate material to supply this demand or the demand would not be filled. At this point in the race a number of clever, aggressive Yucatecans, educated in the sciences in this country and abroad, sprang into the game. They saw the future commercial possibilities of the neglected sisal plant. At their own expense they built railroads into the arid, dry territories where henequen grew. They invented new machines, capable of cleaning 100,000 leaves a day, and soon began to compete on an equal basis with the manila fibre.

The Spanish-American war temporarily advanced the price of manila fibre to such an extent that good grades of manila fibre commanded a price which was practically prohibitive for binder twine. Therefore, manufacturers of binder twine concentrated their energy and genius in the production of a perfect binder twine from sisal. This required some adjustment of machinery and some change in methods, but manufacturers of twine succeeded so that the twine made from sisal has for some years been as perfect and satisfactory as any binder twine ever made from any material. This has resulted in the increased use of sisal, until during the past season a large per cent of the material which was used in the manufacture of binder twine in the United States was sisal fibre.

More than $20,000,000 is spent yearly in the purchase of sisal and manila fibres which are imported from Yucatan and the Philippine Islands. In an effort to find a satisfactory substitute for these tropical fibres, the International Harvester Company expended more than $1,000,000 experimenting with home grown flax. The experimental work was successful, and a twine was produced which was satisfactory in every way except that crickets and grasshoppers ate it, causing the bundles to fall open in the field. Experiments extending over a period of several years have failed to find any treatment to which the twine could be subjected to make it immune from the attacks of insects, and twine manufacturers are compelled to continue the importation of sisal and manila fibres.

A Field of Sisal



Manila Plants

THE HISTORY OF BINDER TWINE

Binder twine as a staple article of commerce had its beginning in the year 1880. Experiments with machines which bound grain with twine began several years prior to 1880, and in 1879 a few twine binders were successfully operated. From the beginning of these experiments, twines of various kinds were utilized, principally consisting of small cords composed of two or more strands and made from Kentucky and other soft fibres. Those engaged in the development of the twine binder early recognized the difficulty of securing binder twine of proper quality. Naturally the first experiments were made with types of twine and cord then in use, and as the work progressed the experts discovered that twine, in order to bind grain successfully, must possess some qualifications in addition to strength and uniformity of size. In order to work well on the knotter, the twine must possess a firmness or coarseness in order to strip from the hook after the knot is formed. It frequently developed that a very soft twine which was strong enough to do the work would cling to the knotter hook so tenaciously that when the bundle was discharged the twine would break instead of stripping off the hook. Another important qualification was strength on the knot. Many twines with sufficient tensile strength cut or break easily on the knot, which renders them unfit for binder twine.

William Deering was one of the first to make thorough field experiments with the twine binder, and during the harvest season of 1879 he operated with considerable success a few Appleby binders. The question of twine suitable to do this work was found to be most difficult of solution; notwithstanding which, Mr. Deering had such faith in the new invention that he undertook the manufacture of three thousand twine binders for the harvest of 1880. He immediately gave the problem of securing suitable twine his close, personal attention. Among other experiments he untwisted a manila rope and used the strands, and became convinced that, if these rope yarns could be spun small enough, a successful binder twine would be the result. He approached several ropemakers, who promptly turned him down. Finally he went to Philadelphia, visited one of the leading cordage factories where large quantities of wrapping twine and other coarse cords were made, and tried to induce the proprietor, Mr. Bailey, to make some experiments with manila fibre. This Mr. Bailey refused to do,

but stated that Edwin H. Fitler, who owned a large rope factory in Philadelphia, was better equipped to make this experiment than anyone else with whom he was acquainted. Acting on this suggestion, Mr. Deering visited Mr. Fitler, who, by the way, was for several terms mayor of Philadelphia, and who was a very keen and successful business man. Mr. Fitler was disinclined to make any experiments, stating that rope yarn as they were making it ran only 300 feet to the pound and that it was practically impossible to spin it down to 700 feet to the pound, which was the size Mr. Deering required. However, upon learning that if the experiment proved successful, Mr. Deering would place an immediate order with him for a number of carloads, Mr. Fitler, with his usual business acumen, recognized the possibility of increasing his business and immediately entered into an arrangement with Mr. Deering. He promptly began making adjustments on his preparation and spinning machinery and quickly produced an article which in the tests at the Deering factory proved the superior qualities of this type of twine. A large order was executed, and that was the beginning of a business which in thirty years has grown to 300,000,000 pounds annually, valued at $20,000,000.00.

The knowledge of Fitler's success spread rapidly, and nearly all manufacturers of hard fibre rope began the manufacture of binder twine, and finally some large mills were built and equipped solely for the production of binder twine.

The early success of Fitler, followed by other rope manufacturers, was possible for the reason that practically the same method of preparation and same kind of spinning machinery were used then as now. Rope of good quality was produced at that time, but previous to the binder twine era no effort had been made to spin the yarns fine or to make them absolutely uniform. The twisting of several strands into a rope made absolute uniformity of the individual yarns unnecessary. The cordage manufacturers at that time also had balling machines which were practically identical with those now used, and wrapping and other commercial twines were put up in balls like the balls of binder twine to-day. These points are mentioned simply to call attention to the fact that the cordage manufacturers of 1880 were only compelled to adjust themselves to the new product. There was no necessity for radical changes in their mechanical equipment.

It will be of interest to know that the young man who was conducting field experiments for Mr. Deering at that time was no other