

Topic: Saskatchewan Contributions to Harvesting Technology
Prepared by Amy McInnis, August 2004, for the Winning the Prairie Gamble exhibit,
North Battleford WDM

Saskatchewan inventors have contributed to the development of harvesting technology. These inventors, although innovative in their designs, did not achieve great commercial success for their efforts. However, their ideas were incorporated by full-scale manufacturers, and thus, their legacies live on under the harvest moons each year in the machinery their ideas inspired. The following is a brief summary of two such Saskatchewan innovations that forever changed harvesting.

1. Helmer and Ellert Hanson - Swathing and Swath Threshing

Farmers Helmer and Ellert Hanson of Lajord, Saskatchewan were the first to successfully introduce the practice of swathing and swath threshing in 1926 (Saskatchewan Agricultural Hall of Fame, 43). The brothers began discussing the idea of swathing and picking it up with a modified conventional combine in the mid-1920s due to a lack of available farm labour and concerns over cutting harvesting costs, as traditional methods were labour intensive. The Hanson's ideas built upon the experimentation of August and Ole Hovland of South Dakota, who were relatives to the Hansons. The Hovlands noticed that grain seemed to dry better when it was allowed to lie loose on the ground, rather than the traditional way of bundling it into sheaves. August and Ole designed and developed machines for harvesting in this new way. In 1908, August Hovland received an American patent for a "central delivery reaper", which was essentially a swather, and a "travelling thresher" for picking up and threshing the rows. Unfortunately the Hovlands were ahead of their time. Their ideas received little attention from farmers, and implement manufacturers were content to sell their established lines of equipment (Hanson, 4-8).

According to Helmer Hanson, the brothers set out to "...build a swather from scratch and to convert a swather to pick up a standard type 16-foot combine to pick up swath row or rowed sheaf with no adjustments from the one to the other" (10). The initial combines were modified to pick up both swath rows and sheaves, in an effort to minimize the risk of converting to an essentially unproven method of harvesting utilizing loose, swathed rows. "To risk the partial or complete loss of our crop ready to harvest was enough to—well, just stop you dead in our tracks" wrote Helmer of the decision to modify a combine to pick up both swathed rows and sheaves (14). Interestingly, both brothers built their own machines and "Although we worked six miles apart and conferred only occasionally when we got too tired in the head, these machines were almost exact duplicates" explained Helmer (12). In the spirit of many prairie farm inventors, "All our blueprints for the whole thing were stored between our ears, no drawings, each of us could see in his mind the complete machine and swather ready to go to work" (14).

The Hansons were not interested in patenting their ideas, and shared their ideas freely: “we welcomed engineers from any of the implement companies, they were free to copy any or everything. Our relations with the companies and their engineers were cordial at all times. We did not apply for a single patent on the whole set-up. We still have our farms, we did not lose them in a court trying to defend specific patents” (Hanson, 10). Unlike the Hovlands, the Hanson brothers did receive considerable attention from large manufacturers. In 1927, an International Harvester Company (IHC) engineer from Chicago visited the Hansons, and evaluated the machines in the field. IHC came out with the first swather in 1928 - the 12 foot McCormick-Deering Windrow-Harvester, which was based on the Hanson’s design (Wetherell, 167). The J.I. Case Co. sent out their chief designer Wallace F. MacGregor in 1927. After consulting with the Hanson’s, he offered the brothers assistance. At the Hanson’s request, and at no expense to them, MacGregor had the company specially construct 32-inch combine cylinders, increased from factory-made 24-inch cylinders, to increase the capacity of the modified combines to pick up “such a heavy row” (Hanson 15-16). MacGregor brought out J.I. Case President, L.R. Clausen in 1928 to observe the machines. The Hanson’s efforts were validated by Clausen who said, “I don’t know whether you men realize it or not, but you have done a factory job here” (Hanson, 16). “Mr. Clausen’s remark was the most appreciated of anything said to us about the whole thing” wrote Helmer (Hanson, 16).

IHC, Case and John Deere were among the first of the companies to market swathers, with other large companies picking up the idea soon after (Saskatchewan Agricultural Hall of Fame, 43). According to Donald Wetherell in *Breaking New Ground*, conditions in the late 1920s benefitted the acceptance of the Hanson’s design over that of the Hovland’s some 20 years prior. “Two factors were especially important in the changing attitude—combines, the other part of the Hovland experiment, were by then available, although only for straight combining, and there was a growing belief that threshing unstooked grain would be ideal” explained Wetherell (166).

Although farmers today take swathing for granted during harvesting operations, those farming during the introduction of swathing equipment in the late 1920s found this new method to be quite a departure from conventional harvesting techniques of the day. In the April 5, 1929 edition of *The Nor’-West Farmer*, the article “Opinions on Swathers” contained many favourable reports from farmers who had purchased machines. H.H. Tunison of Gray, Saskatchewan said: “We liked our combine just fine. Swathing is the best way to cut grain in this district. Some tried the straight combining but it was not very satisfactory” (5). R.B. Carins of Langbank, Saskatchewan wrote: “The swather and pick-up is not absolutely necessary in this district, but it enables one to start threshing a few days earlier, thereby eliminates some risk in leaving the grain standing too long” (5). W.R. Fansher of Govan, Saskatchewan heralded the swather: “One season’s experience with the combine and swather has convinced me that the swather is a decided advantage in handling the crop over straight combining...” (12).

2. Western Roto Thresh Combine

Early methods of separating grain during harvest, either by hand or by machine, were based on the principle of shaking the grain free from the straw and chaff. The Western Roto Thresh Company of Saskatoon came out with a revolutionary new rotary type of combine in the 1970s which utilized the principle of centrifugal force to achieve grain separation. Combines manufactured to this point utilized a straw walker system which shook the grain from the straw using conveyors (Grosse, 63 Bates, 16). The conventional straw walker design was prone to straw build-up in heavy straw crops or rolling land, preventing grain from reaching the straw walkers, resulting in grain loss (Lipsit as quoted in Bates, 31). In addition, these type of combines used blowing air to remove the chaff from the grain and sending it out the back of the combine, which also resulted in grain loss (Bates, 31). In the June 1974 *Country Guide* article “Rotary Combines Make Their Showroom Debut,” the design principle of the Roto Thresh is explained: “In the rotary combine, grain and straw pass through the cylinder into a rotating drum. Centrifugal force spins grain and straw to the drum’s perforated side wall. Grain passes through the holes and drops onto five augers that carry kernels back to the cleaning section” (Bates 31). The Roto Thresh also employed a unique vacuum-type cleaning system to remove chaff

In the late 1960s, two Winnipeg farmers experimented with the idea of using a rotating drum and centrifugal force to separate grain. The farmers had mocked up a drum powered by a gas engine, and had been impressed by the “high capacity separation” achieved, with a minimal loss of grain, according to former Roto Thresh President Barney Habicht (1). At the time, Habicht was president of a paving equipment company in Saskatoon, and was approached to work in tandem with the Department of Agricultural Engineering, headed up by Professor Oliver Symes, to build prototypes incorporating the rotating drum design of the Winnipeg farmers (Grosse, 62).

The results from early testing of the prototypes during the wet fall of 1968, near St. Denis, Saskatchewan were promising. In a 1999 interview, Barney Habicht described the first run of the rotary prototype:

And we were finding that we were getting very high capacity runs with very low loss. I think our highest loss was about one and a half percent with the threshing capacity at 300 bushel and (sic) hour. And we never plugged everything, you just kept on going. And there was another combine in the field, it was a standard brand combine and he could only go about a quarter of a mile and he’d be plugged up and he would have to get in there and unplug the whole thing before he could go again. (2)

Commercial production of Roto Thresh combines began in the early 1970s at a production plant in Saskatoon. Customers who purchased the machines, which sold for around \$30,000 a piece, were impressed with the new technology of the Roto Thresh. Clotaire Denis of St. Denis was the first farmer to purchase a Roto Thresh in April of 1973. In the June 1974 *Country Guide*, Dave Bates wrote: “The Denises believe the combine’s reportedly improved efficiency will cut their

losses by about 50%, putting 4% more grain in the tank instead of out the back. It will save time too, Clotaire adds, because they won't have to slow down when harvesting grain on the rolling sections of their land" (16). Merv Lloyd of D'Arcy, Saskatchewan bought the fourteenth Roto Thresh combine in 1975 after seeing it tested, and like it so well that he bought a second machine which he used until 1996.

Despite industry buzz about the new technology and good customer feedback, Western Roto Thresh Ltd. could not compete with the full line manufacturers "that were still making profits selling conventional machines" (Grosse, 63). When things were all said and done, only 50 Roto Thresh combines were built. "Although the machine never achieved commercial success envisioned by its designers, the box-shaped combine with the distinct rotating drum retains a small but loyal group of supporters who say it was a pioneer in late 20th century farm technology." wrote Noelle Grosse (62).

The rotary principle was incorporated into a combine produced by John Deere a few years after the production of Roto Thresh ceased, and the patents for the rotating drum and cleaning system were let go. During a Roto Thresh business trip to the United States, a comment made by a John Deere representative foreshadowed the future. The representative said: "Don't let go, you just keep going because you've got the best idea yet and its going to be the coming thing" (Habicht, 4-5).

References:

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