Harry Ferguson

The Machine World's Unhonoured Maverick

(An Article from the Family Herald, March 23, 1961 by Professor P. H. Southwell of the Ontario Agricultural College in Guelph, Ontario)

The man did more than any other for mechanized farming died without any of the usual accolades, but almost every farm bears tribute to his genius. Few men with a mission ever manage to be successful commercially. Harry Ferguson was one of the few. What Ferguson did for farm machinery is comparable to what Edison did for homes, or what Ford did for transportation, or what Bell did for communications. Ferguson was one of the few great men which agriculture can claim and almost every farm today has benefited from his work. When he died last autumn at the age of 75, he had been a multi millionaire for quite some time.

Ferguson succeeded because he was convinced that he was right and because he was a genius. He was capable of not only conceiving and developing a revolutionary idea, but also of promoting it with high success. This happy combination of talents in one man has had profound effects on the mechanization of farm field work. The results of his engineering and inventive ability have been in use on farms for more than 20 years now, but it is doubtful if we would have had these developments, perhaps even yet, if he had not had such drive and ability.

Strangely his immense contribution to farm mechanization was never formally recognized by suitable honours from the agricultural engineering profession on either side of the Atlantic. Although there is little excuse for such an omission, in this writer's opinion, a possible explanation is that Ferguson was a rather shy, aloof, and retiring sort of man who was hard to get along with and did not push himself forward as a person. The only thing he pushed was his revolutionary "system" and, like many men of purpose, he probably upset a lot of people along the way. He was more of a crusader than many other successful men appear to have been; but like many other great men, he was at first regarded by the pundits as merely a crank.

It is seldom realized that Harry Ferguson worked on his project for a long time and achieved success rather late in life. He was born in 1884 on a farm in County Down in Ireland. His bent for mechanical things appeared early in his love for motorcycles and automobiles. An indication

of his ability is that he designed, built, and flew his own monoplane by the time he was 25, just 6 years after the first powered flight in the world was made by the Wright brothers.

If Ferguson had stayed in aeronautics, he might well have become famous in that branch of engineering instead, and farming would have been the loser, but, during the 1914-1918 war, the Irish Department of Agriculture put him in charge of the operation and maintenance of tractors and machinery on the farms of Ireland. It may have been a very big job, but it appears to have sparked his interest in farm mechanization.

Ferguson came quietly on the agricultural scene in the early 1920's when he designed a linkage for mounting a plow directly on the rear of a tractor, the first step in his theory that implement and tractor must be an integral unit. Many years of hard work followed and led to the development of the famous three-point linkage which we now universally employ. The second step was hydraulic activation of the mounted implement, through the three-point linkage. Ferguson not only used hydraulics to lift and lower the implement, but also to control its depth in work. This was an outstanding invention intimately associated with his theory of weight transfer and the conception of a light-weight tractor. By the early 1930's the Ferguson system was taking shape. How Ferguson financed himself at this time is obscure (he was over 40) but it would appear that he had private resources.

In 1933 pneumatic tires were introduced for farm tractors to replace the steel lugged wheels which had been used for over 30 years. To Ferguson this was an important change. A great deal of work with an expanded staff seems to have been accomplished in the next couple of years and his tractor was ready to go into production by 1936. Harry Ferguson was then 52 years old.

The quality of the design work which was done before production commenced is shown by the fact that the Ferguson tractors which were built during the following 25 years differed only in details from the original machine.

With this outstanding design he made five distinct and far reaching contributions, each important in its own right. Firstly, he produced a light-weight machine showing that tractors need not be heavy, as they always had been. Secondly, he mounted the implements on a tractor itself-instead of dragging them separately behind-so as to form one single compact unit. Thirdly, he designed the three-point hitch for implement mounting. Fourthly, he introduced oil hydraulic systems for easy implement positioning and control. Fifthly, he put forward a theory of weight transfer from a rear-mounted implement onto the tractor frame.

Each of these developments was individually significant and affected tractor design throughout the world. When put together, they formed the Ferguson system and in effect revolutionized both tractor design and farm mechanization.

But the boldness of his attack on conventional ideas and the extant of his revolution can perhaps be gauged from the fact that the rest of the tractor industry was not only scornful at the beginning but continued to be so for a long time. With the exception of only two manufacturers, the industry as a whole took about 10 years before finally conceding that Ferguson might be on the right track. Then his lead was followed in a variety of ways.

Ferguson was primarily an inventor and had no manufacturing facilities. Throughout his life he appeared to prefer to leave the problems of mass production to other men specializing in that work. His first tractor was produced by the David Brown Company in England, which previously had not been in the tractor business, but had made the gears for the prototype. Production of the Ferguson Brown tractor continued until 1939 and made a definite impression. The arrangement ended in disagreement however and Ferguson went to the United States. Here he entered into an arrangement with Henry Ford to produce the Ford Ferguson tractor on this side of the Atlantic. Ferguson had the design and Ford had the facilities to produce in quantity. A great many tractors were built before this arrangement ended in disagreement in 1947.

It was at this stage that Harry Ferguson, at the age of 62, for the first time fully entered the business of producing and selling tractors. He arranged for the Standard Motor Company to make the tractor in England and built his own factory, presumably because he had to, in Detroit.v The Ferguson Company forged rapidly ahead with a program of production, sales and service in all the world markets and the gray tractor, so similar to the Ferguson Brown machine of 10 years before but with the wide range of mounted equipment, became familiar everywhere. In the USA however, Dearborn continued to produce tractors using a replica of the Ferguson system and in 1951 Harry Ferguson successfully sued for infringements of his patents in the famous law suit. By this time, he had collected around himself one of the most progressive design teams in the business, and it was a surprise to everybody when an amalgamation with the Massey Harris Company was announced in 1953, Less than a year later, he retired at the age of 70 to pursue another challenge, namely to design a new type of automobile. Ferguson's mark on the mechanization of farming throughout the world has been immense and the full implications of his design work may never be fully assessed. But let us consider a few of them.

In many areas, mounted equipment is now used on every farm and the three-point linkage, which Ferguson invented, is universally employed; it has been changed only by the addition of quick-hitch devices. It is hard to imagine modern farming without mounted equipment.

The application of oil hydraulic systems on tractors has been extended considerably since Ferguson led the field and indicated the full potentialities. Hydraulic pressure is now one of the greatest work savers on the modern farm; we only have to think of manure handling without it to realize this. He was also ahead of his time in using a high oil pressure (which has yet to be exceeded) and thereby saving weight and space. Although there is little doubt that we would eventually have used oil pressure to position the larger trailed implements, Ferguson showed the possibilities and did more than any other man to promote tractor hydraulics.

He also used his hydraulic system to maintain a constant draft; this gave the advantage of constant depth control as alternatives, and many others use some device for weight transfer from the mounted implement onto the rear wheels. All these developments spring from Ferguson's inventive genius. As well as wheel slip by varying the depth of work to keep a constant draft, he also used wheel spin as a safety device. Ferguson was very conscious of the safety problem and did much to focus attention upon it; but then his light weight design required that he should, and it was unfortunate that the misuse of his machine without his mounted implements did cause accidents.

His contention that a tractor could be light in weight has not been fully adopted because it was dependent on his system and because of the problems of hauling wagons and other trailed equipment. But the Ferguson tractor has been the lightest on the market for many years and undoubtedly strongly influenced designers by its success. The effect of its maneuverability, easy operation, and clean lines has also been considerable.

Harry Ferguson was one of the greatest designers of agricultural machinery we have ever had. His major contribution was the transition to mounted equipment of all types and the completely hydraulic control of them. This was a great influence on the progress of farm mechanization and outstanding at the time it was made. Both in this large conception and in many details of design, his work has influenced that of the whole tractor industry and has been of great assistance to all farmers, particularly on small and medium-sized farms. It is to be hoped that there is another such man working somewhere, in a barn or at a drafting table, to take us to the next jump forward in mechanization.