



The Ferguson medium pressure sprayer S-LE-21, a very rare machine today.

A TE.H20 with the early-type loader L-VE-20 being used to fill a manure spreader type A-IE-A20.



was hit they would safely swing back out of harm's way. This machine was very popular with cereal growers and sold in large numbers.

A more sophisticated machine was also marketed, this being the medium-pressure sprayer, aimed more at potato growers and at orchard owners for tree spraying. A hand-held lance was available. The machine was designated S-LE-21 and featured a 92-gallon (418 litres) tank feeding to a twin-cylinder pump that could deliver 16 gallons (72.7 litres) at 180psi. It was PTO driven at 500rpm through a set of three belts. Again a pressure regulator and gauge were fitted, likewise an inline filter. Unlike the low-volume sprayer, this one had the facility to suck water into the tank from a pond or river through a strainer. Inside the tank, an agitator was fitted to ensure that powder chemicals mixed with water did not separate out. The folding boom gave a spray cover width of 21ft 6in (6.55m), and application rates could be varied between 20 and 85 gallons per acre (225 and 955 litres per hectare). These were expensive, rather specialist sprayers which did not sell in great numbers and are very rare today. When loaded with chemical spray the outfit was very heavy, and front wheel weights A-TE-91 had to be fitted, likewise the stabilizer bars kit A-TE-59.

with its gauge generally set at 40psi, supplying material to the spray booms. These folded down to horizontal for field work, giving a covering width of 19ft 6in (5.95m) through thirteen nozzles which could accommodate three different sizes of inserts to give application rates of 5, 10 or 20 gallons per acre (56, 112 or 225 litres per hectare). The spray booms were height adjustable from 18in to 33in (457mm to 838mm) and were spring loaded, so if an obstruction



PLANT CULTIVATION: SPREADING MANURE AND FERTILIZERS

In the range of implements for fostering the growth and establishment of plants, there was equipment for loading and spreading farmyard manure as well as manufactured chemical fertilizers. One implement offered in the early range was the manure loader L-VE-20, which was mounted on a pair of special brackets attached to the front axle (as was the hay sweep, discussed below). Two hydraulic cylinders of 1.5in (38mm) bore by 15in (381mm) stroke took their pressure from the tractor's own built-in pump, and raised the loader arms and fork to a height of 66in (1.68m), which was quite sufficient for loading muck spreaders. The eight fork tines were of high-carbon steel, heat-treated to resist abrasion and bending. The fork was spring-loaded, so that after dumping its load it returned to the latched position. Its capacity was normally rated at 600lbs (272kg) with a tear-out force of 1000lbs (454kg). To achieve this in practice, it was essential to fit a concrete counterbalance weight to the rear of the TE20, attached by two substantial hooks cast into it. This fitted to the tractor's three-point linkage automatic pick-up hitch A-TE-20. The driver could now pick up the weight on to the rear of the tractor without effort, load the spreader with

the front-mounted fork, drop off the concrete balance weight, and with the pick-up hitch connect to the spreader draw bar - all accomplished without leaving the seat of the tractor. This was advanced agricultural engineering for its time, and although it may sound rather puny by today's standards, it was a big leap forward from a man with a dung fork.

Turning next to the manure spreader, the Ferguson A-JE-A20 was produced by J Shankey & Sons of Hadley Castle Works, Wellington, Shropshire. The machine was of fairly conventional design but it did feature an all-steel body of about 70 bushels (2.5cu m) capacity that tapered towards the front by 2in (51mm). The taper helped to loosen the muck as the floor slats, which were ratchet driven from the 750x20 land wheels, moved slowly rearwards. The land wheels also drove the two beater-bar assemblies and the spreading rear auger, which was made half left-handed and half right-handed, to give a spreading width of about 7ft (2.13m). The operation of the spreader was controlled by a single lever within easy reach of the driver. The top notch was the neutral position for travelling. The second notch engaged the beaters and rear auger only, the conveyor remaining stationary. The third notch engaged the conveyor and gave distribution of four loads per acre (ten loads per

A TE.D20 fitted with the high lift loader M-UE-20, commonly known as the banana loader, doing the same job. Note the rear concrete weight.

hectare). The remaining four notches gave increments, each of four loads per acre, to a maximum of twenty. Third gear was recommended as the best choice when working.

As time went on, the early type manure loader was deemed to be rather weak and of inadequate lift capacity in terms of both weight and height, so Harry Ferguson engineers developed the high-lift loader M-UE-20 commonly known as the “banana loader”, because of the profile of its lift arms, which were made from pressed fabricated steel. This loader was manufactured by Steel’s Engineering Products Ltd of Crown Works, Sunderland. It had a maximum lift height of 11ft (3.35m) compared to the 5-6ft (1.52-1.83m) of the L-UE-20, and a maximum load of 1000lbs (454kg) as opposed to 600lbs (272kg) of the earlier model. Again the concrete balance weight and pick-up hitch were essential for successful operation. A nice feature was that a third ram was provided, to push a spring-loaded plate on the forks; this allowed control of the dumping of materials into a spreader or trailer. This cantilever-type loader was pivoted on a substantial frame positioned over the rear axle. The ram attachment was about a quarter of the way along its length, the lower ends of the rams attaching to a bracket mounted under the gearbox housing. An additional quadrant of smaller size had to be fitted to the left-hand side of the transmission housing; its function was to control a selector valve and it had three positions. The downward position diverted oil flow to the lift arm rams, the central position was

neutral for transport, and upwards movement of the lever brought in the push-off ram circuit. The control of pressure-fed oil to the circuit was by the normal draft control lever. Ferguson engineers, who were anxious to protect the tractor’s hydraulic system from shock loads imposed by loader operation, developed a patent valve bolted in place of the dipstick inspection plate on the right-hand side of the axle housing. This would blow off if pressure in excess of 2000psi developed within the system. In addition to recommending of the use of the concrete weight, it was suggested that the 400x19 tyres and wheels be changed to 600x16 due to the additional front axle loadings. No power steering kit was offered in those days! This was a good and popular loader.

After the merger with Massey-Harris a three-point linkage fertilizer spinner broadcaster, FE-30, was made available to customers. This was very much based on Massey-Harris’s MH721 trailed broadcaster, which was land wheel driven. The Ferguson version featured a hopper of 6.88cu ft (0.195cu m) with framework to connect to the tractor linkage, and built-in stands to assist parking. Drive was taken from the PTO through a rubber-jointed sliding shaft to a right-angle drive gearbox made of cast iron (and holding 1.5 pints/0.85 litres of oil). There were two vertical concentric drives: one drove the spinner plate at high speed, while the other drove the agitator at a relatively slow speed in the opposite direction. A regulating sliding tubular shutter controlled the rate of application. It was essential to use the stabilizer kit and front wheel weights with this implement. With wide variations in the nature of fertilizers, such as granular or powder types, it was rather hit and miss in practice, but experienced operators achieved good, even results. The author can remember using this machine for grass seeding by preliminary hand mixing of fertilizer and grass seed, a laborious process that would not find much favour today. Internally, the top of the hopper was braced with a tubular strut, and to this was welded a small triangle of flat steel in the midway position. This enabled paper and plastic sacks to be punctured and then torn open to discharge the contents into the hopper. It is believed that this was a patented feature, and it was certainly a nice alternative to dropping one’s penknife into the fertilizer. A trailed version was also marketed.

A photograph taken in the Fletchamstead Highway engineering shop of the Massey-Harris-Ferguson mounted spinner broadcaster FE30 (721). What looks very much like an LTX is lurking in the background.



The Ferguson buck rake being used on a cold winter's day. Note the drive for the Tractormeter adjacent to the dynamo.

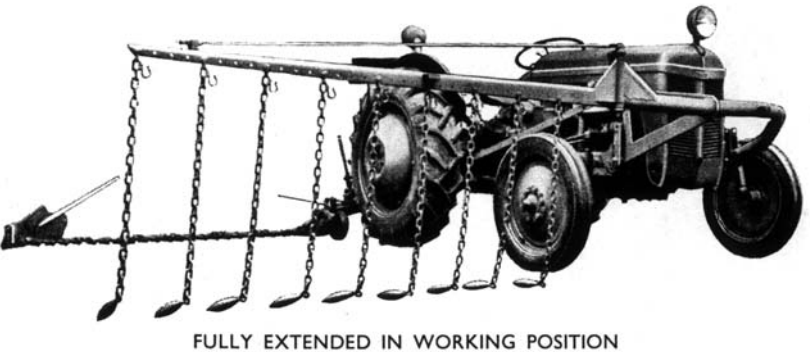
MOWING AND HARVESTING

Turning our attention now to the range of crop harvesting implements that Ferguson marketed, the first to look at is the Ferguson agricultural mower 5A-EE-B2 with 5ft (1.52m) finger bar; a 6ft (1.83m) type was also available. This rear-mounted machine sold in large numbers and was deservedly popular; it was well-designed and, being PTO driven, drive was smooth and positive. Very early examples were imported from America; otherwise this mower was made for Ferguson by the Pressed Steel Company of Paisley near Glasgow. The centre bar could be raised and lowered by finger-tip control on the draft control lever. A wooden swathe board and stick were fitted as standard but, strangely, the parking stands were sold as an extra. If these were not fitted and used, mounting and demounting became a tractor driver’s nightmare, and squashed fingers ensued! One helpful idea was that the stay bar for retaining the blade in the vertical transport position doubled as a puller for extracting the knife from the mower bed. While dealing with the mower, it is worth looking at an auxiliary piece of equipment designed to be used in conjunction with it. This, the game flusher PA-EE-20, was a rather unique device. It was mounted on the front of the tractor on brackets designed for the early manure loader, and the support bar carried nine adjustable chains terminating with cast-iron weights, rather like those used in sash windows.

The idea was to scare game birds away before they were cut to pieces with the mower’s knife. Very few were made, but this was nevertheless a nice idea to save game birds from a most unpleasant encounter.

The Ferguson side-delivery rake D-EE-20 was a beautiful design, very efficient in operation when compared to offerings from other makers of the day. Being rear mounted on the three-point linkage, transporting it was no problem apart from it being 9ft 11in (3.02m) wide. It was PTO driven, via a V-belt, so there was full power at all times to the rake and no risk from wheel slip, which often caused problems with other makes. Nevertheless, very few of these rakes were sold, and even fewer have survived. Normal operating speed was 4.5mph (7.2 km/h) in third gear. Where it was necessary to use a gear lower than third, as when dealing with a very heavy crop, a PTO speed reduction unit

The game flusher in the working position ahead of the mower.



was available as an accessory. This was in effect a two-speed PTO unit, as both normal and reduced speeds were available from twin shafts projecting from the housing.

The grass having been cut, Ferguson offered a buck rake to collect and transport it to the silage clamp. The buck rake was not a Ferguson invention - that accolade goes to a pioneering farmer, Rex Patterson - but Ferguson engineers developed their own models, made of high quality materials. They were three-point linkage mounted, of course, and the fitment of the stabilizer kit was essential, as was the use of front wheel weights to maintain steering control on slopes. The buck rake was offered as a ten-tine model S-EE-20 7ft 2in (2.18m) wide, or with twelve tines (A-10-SEE) at 8ft 8in (2.64m) width. The weight of the twelve-tine model was 280lbs (127kg), and it had a rated carrying capacity of 750lbs (340kg). As well as providing the facility to raise the linkage and trip the tines to discharge the load, Ferguson design engineers incorporated a latch within the attachment linkage to take the load off the hydraulic system when travelling - a most worthwhile refinement since the shock loads transmitted to the system could be considerable. Apart from its primary design function, the buck rake quickly found many other uses around the farm: transporting hedge cuttings, straw bales or grain sacks, and even moving small wooden buildings such as hen runs.

A development of the buck rake by Ferguson engineers was the kale cut rake G-HE-20, an implement which as far as is known was not produced by any other organisation. It was 8ft (2.44m) wide, weighed 550lbs (250kg), and was basically a buck rake with triangular side panels, a reciprocating mower-type knife fitted to the ends of the tines, and PTO drive; again a stabilizer kit was needed, and front wheel weights were highly advisable. The special feature of the knife mechanism was that it was fitted with blunt-pointed fingers, and the knife sections were of the serrated type. The kale cut rake was attached in the normal way, but a Ferguson position control hitch was designed so that the tractor's lower links could be held in a number of positions, almost over the full length of their travel. For transport, a locking latch took the load off the hydraulic system. The method of operating was to lower the implement to the kale crop, set the height of cut, engage the PTO-driven knife and reverse gear, and drive at full

throttle into the kale! By this expedient one could collect a full load of cut kale in a run of 10 to 12 yards (9 to 11m). Farm workers of fifty-odd years ago must have been very grateful when the gaffer lashed out and bought one of these luxury implements. Cutting kale 4ft (1.2m) high by hand on a cold, wet winter's day and loading it onto a trailer is not anybody's idea of fun!

An early implement that soon fell by the wayside and hence is very rare today was the hay sweep S-EE-21. Hay sweeps were common implements before the arrival of the pick-up baler on the hay field. They generally fitted to the front of a tractor or powerful old car, and were used to sweep hay windrows to a stationary baler strategically placed in the field. The hay was then hand forked into the baler. An alternative method was to sweep the hay to an elevator, into which it was hand-fed to be stacked. Haystacks with a crudely thatched roof of wheat straw were once a common sight in the English countryside. It is not surprising to find that the Ferguson hay rake was different from other makes in that the design was equipped with tines made of aluminium alloy for strength and lightness. The sweep fitted to brackets which were the same as were used for the weight frame and early manure loader, and which bolted to the front axle. It could be raised almost to the vertical for transport, achieved by a simple linkage connected to the rear lift arms of the tractor - yet another neat example of finger-tip control.

HARVESTING POTATOES AND BEETS
The Ferguson potato spinner D-HE-20 was manufactured by Steel's Engineering Products. This implement was desirable and popular because it represented a big leap forward from previous trailed wheel-driven machines that would jam up in wet ground conditions. An earlier version of the PTO-driven potato spinner was produced in Northern Ireland in the early 1940s, and would have fitted the Ford-Ferguson 9Ns that had been imported as part of the lend-lease arrangement. The D-HE-20 is three-point linkage mounted, and a rocker extension is fitted to the top to improve depth control. The stabilizer kit had to be installed. Incorporated into the PTO drive was a spring-loaded dog clutch, a safety measure to prevent damage to the machine. Drive was fed into a cast-aluminium gearbox through bevel gearing, with



output to the main spinning wheel. This carries tines, is inclined at about 45 degrees to the vertical, and is responsible for flicking the potato tubers out of the soil. It rotates in a clockwise direction. A second disk carrying tines of a curved design rotates counter-clockwise and is also set at 45 degrees to the vertical, facing outwards by about the same amount. In operation, potatoes hit this rotating assembly and are relieved of any remaining adhering soil. They are confined by a curtain of hessian material hanging off a projecting arm. This results in neat rows of dug potatoes, ready for hand collecting into buckets - a good old-fashioned back-breaking job!

The Ferguson beet lifters made use of the toolbar frame, either the 1L-HE-20 single-row, or the 2L-HE-20 double-row. These implements were designed and produced with the intention of lifting sugar beet, but carrots and some other root crops such as parsnips could be successfully lifted. The principle of operation was that the 15.5in (394mm) diameter disc coulter running either side of the crop row would cut the soil, which in turn enabled the high carbon steel share to lift the crop and soil to a raised level, and thus enable a hand picker to collect the crop. The single-row model had an overall width of 34in

(864mm) and a weight of 190lbs (86kg), while the two-row model had an overall width of 86in (2184mm) and weighed 360 lbs (163kg).

The beet topper L-HE-21 was developed to cut the cost of beet harvesting, with a low capital cost. Complete beet-harvesting machines were around in the mid 1950s, but due to their complexity they were expensive and beyond the reach of the smaller grower. The main frame of the Ferguson machine is an inverted U-section channel which at its front supports a transverse axle, carrying on the off-side a land drive wheel. The land wheel axle has a sprocket on the near-side which transmits drive to the feeler wheel by chain. The feeler wheel, mounted centrally at the rear, is comprised of four serrated rings. The cutting knife is mounted on a parallel linkage below the feeler wheel at 45 degrees to the direction of travel. As the feeler wheel rotates at a slightly higher speed than the forwards travel, it can ride the beet and hold it steady as the top is cut off at ground level. On the forward part of the frame are two adjustable foliage deflectors, mounted on guide shoes. The machine worked fairly well in good conditions, but it is understood that it never really made it into production. Only about five are believed to have been sold, so it is very rare today.

*Potato spinner
D-HE-20 in action,
possibly at Stoneleigh
Park.*