

Modern Horse-drawn Equipment

talking to it as I start up – firstly, the engine and then engaging the pto shaft. The horse might jump about to start with but will soon realise there is nothing to fear by the relaxed behaviour of the other two horses alongside him.

Another piece of very good Amish-made equipment that I use a lot is a **Jonas Kuepfer-made manure spreader** (dung spreader) (fig 9). I bought six of them from Jonas in two lots many years ago. Sadly, the Kuepfer family are no longer making these excellent machines. They still engineer horse machinery but mainly for themselves. Fiona and I did visit the Kuepfers who live just down the road from Aaron Martin Harness at Wallenstein, Ontario, six years ago. I have never seen so many metal lathes and precision equipment in a workshop. Jonas showed us two hay-turners that his sons had made for themselves that summer. They were beautifully engineered.

My spreader came in the first lot purchased in 1997. We put four horses on it as we are so hilly. I load it with the tractor and fore-end loader. It is the best manure-spreader I have ever used. In all the time I have had it, I have never once had it block up. I keep the chains well-oiled with waste oil and keep all the grease nipples greased. It also spreads beautifully evenly whether spreading fresh or composted dung. It is a great machine to put a young horse on, mixed in with the other three horses. Again, the young horse gets used to the noise of the floor bed and beaters at the back of the spreader through the confidence and calmness of the other three horses.

One other piece of equipment that I purchased from Pioneer two or three years ago is my **harrow cart** (fig 1). I put four horses on the chain harrows in the spring. The harrow cart is fixed onto the harrow drawbar by two steel rods. The cart literally follows the harrows wherever they go. It saves your legs if you have acres to harrow (although I don't personally mind the walking!) I find it a great bit of kit to use, again, if hitching up a young horse amongst the team. It enables you to be comfortable whilst training the young horse.

We are so lucky to have people such as the Amish who are such experts at designing horse machinery. When Fiona and I visited the Wengards in October 2010, Leon told me that they had sold over 300 ploughs (walking, sulky and gang ploughs) that year so far. That surely speaks for itself!

William Castle looks at new machines which have been developed by groups of enthusiasts and whose designs are available to all

Collaborative ventures with machinery

Even though the availability of horse drawn equipment has improved rapidly in recent years, there are still some jobs for which it is hard to find suitable implements.

One such gap is a tool for cultivating between two rows of vegetables with a single horse, so a working horse association from south east France, HIPPOTESE, has been working on a new horse hoe. Hippotese was formed in 1986 to promote the development of modern animal traction. It runs training courses, collects and disseminates technical and historical information, undertakes technical research and offers loans of equipment to members who can also participate in collective self-help projects.

Rather than starting from scratch with the new hoe, they have taken an existing implement made by the Swiss company, Bucher Guyer AG, as a model. This implement was made up until the 1960s, and when the group discovered them in the 1990s they republished the instruction leaflet and imported as many of these machines as they could find. These were divided amongst members who grew row crops, and the idea emerged to reproduce these machines.

A start was made in July 2014 when

the original machine was measured and modified so it could be built using standard sections of steel, the cast pieces being re-designed so they could be fabricated. In October, 20 people who use the machines gathered together to discuss what features should be changed and which were vital to retain. Then in February last year two prototypes, now dubbed the **NéoBucher** (fig 1), were built by 13 people within three days. Since then the hoes have been in regular use and have been further modified to improve various features including the spring assisted lifting mechanism.

The machine is very versatile. The wheels can be adjusted in height and can be set to different widths. The toolbar which carries the tines is triangular in cross section, allowing quick adjustment and positive location for the tools. For a quick change over the whole toolbar can easily be swapped for another with different tools. The traditional range of commercially available ridging bodies, L shaped and A shaped tines can be used, but it also works with sprung weeding tines and finger weeders which take out weeds in the rows. As part of their aim to be self reliant, the members of Hippotese have made these finger weeders using the rubber used for



(fig 1) The NéoBucher with finger weeders in a crop of lettuce.

Modern Horse-drawn Equipment

→ Collaborative ventures with machinery

conveyor belts. The toolbar is steered from behind with a pair of handles, which are adjustable in height, the whole toolbar being lifted clear of the ground with spring assistance at the end of the rows.

The aim of Hippotese has always been to share information, so the plans for the NéoBucher will shortly be completed and available online under a Creative Commons license, so that other people can draw on their experience, and build their own machine using a minimum of tools; hand tools, a welder, drill and angle grinder.

Another example of collaboration is the organisation Schaff mat Päerd, the brainchild of engineer and part-time farmer, Paul Schmit from Luxembourg. He started designing and building machinery for his own use, but following collaborative efforts with other horsemen and engineers from as far afield as Italy and Sweden,



Paul has formed this non-profit organisation, primarily to develop prototypes to evaluate how modern technologies can be applied to animal traction.

Amongst the experiments already carried out are comparisons of different makes of draught springs to reduce the

(fig 2) Detail of the mono-Rad showing the brake and all the height adjustments.

(fig 3) The mono-Rad with an Italian made Repossi side delivery rake. The data logger strapped to the frame collects information on the force applied by the horse from the load cell behind the swingletree, and the speed of travel from the graduated disc on the wheel hub.

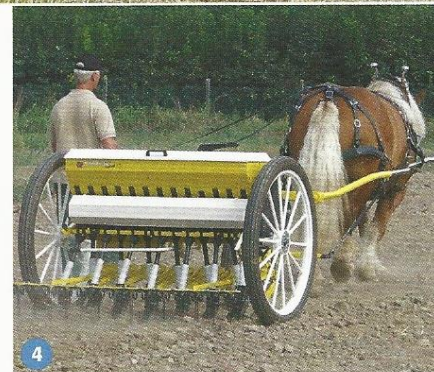
(fig 4) Schaff mat Päerd's Combi-sei seed drill, again with the mono-Rad, Albano Moscarda from Italy driving.



impact on a horse's shoulders; studies on discs, tines and crumblers when used in different combinations, and experiments in harness design using features from different traditions. For the construction of the machinery, parts are sourced from many manufacturers and are incorporated into novel designs, which are often influenced by older horse drawn machines. The testing is done using modern technology; load cells, data loggers and computers.

Most of Schaff mat Päerd's work is on equipment for a single horse, a recent development being the **mono-Rad** (figs 2-4) – a single wheel which can be used in front of different machines instead of a hitch cart. The single front wheel overcomes many of the problems inherent with using a hitch cart, the extra weight is minimal and tighter turns can be made without catching a hitch cart wheel on the implement drawbar. Because of the limited power of a single horse, walking behind the implement is often more appropriate than riding on a hitch cart, but for implements where the driver is riding, a seat at the back is often better both for visibility and safety, and if the machine derives power from its wheels it is better for the driver's weight to be above those wheels.

The mono-Rad features a large diameter wheel with a pneumatic tyre, both features lowering the resistance; the shafts are adjustable in height and width, whilst the draught is via traces rather than fixed shafts, so the pressure



remains on both sides of the collar as the horse puts alternate feet forward. The swingletree is also adjustable in height to maintain the best angle of draught, and it is also easy to attach a load cell behind the swingletree to measure the draught force.

As with Hippotese, the results of Schaff mat Päerd's draught experiments and the designs of the machines are being made available so anyone can use them. Rather than making machines designed by an individual, the work done by both groups demonstrates the advantages of pooling ideas and expertise, and their willingness to share their results with the wider world shows a refreshingly open and inclusive approach which is to the benefit of us all.

More details can be seen on the websites – www.hippotese.fr and www.schaffmatpaerd.org. The Schaff mat Päerd site is in four languages including English; the Hippotese site is largely in French but there is a translate button incorporated into the site.

With thanks to Deny Fady and Paul Schmit