



The little yellow machine

Bob Stanley

In the yard of the Behera Engineering Company near Alexandria stand a score or more sturdy little machines, their bright green and yellow paint adding a dash of colour to the busy scene. Dwarfed though they are by their surroundings, these machines are part of an international exchange of technology that could be the beginning of an agricultural revolution for Egypt's small farmers.

Engineers at the International Rice Research Institute (IRRI) in the Philippines pioneered the concept of "10 horsepower agricultural mechanization" for small-scale rice farmers with considerable success, enabling farmers to increase the number of crops they could produce in a year. Now the idea is being adapted and tested under very different conditions in Egypt by the state-owned Behera Company with the support of an IDRC grant for about one-third of the costs.

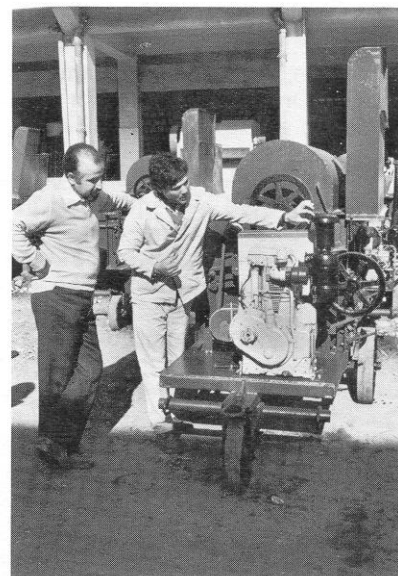
The concept is simple: take a light-weight, reliable 10hp diesel engine, and use it to power a whole family of agricultural implements — threshers, sprayers, drills, planters, pumps — and a basic half-ton utility vehicle. The farmer initially buys the engine with, say a thresher. When the farmer can afford it, additional implements are purchased, perhaps a pump to improve irrigation, or a planter to help get the crops in faster. Each is powered by the one 10hp diesel, which can quickly be transferred from one implement to another.

In Egypt, where most farmers in the fertile irrigated lands of the Nile Valley and the delta already grow two crops a year, the concept is particularly germane. Traveling through the delta from Cairo to Alexandria, it soon becomes plain that the basic sources of power for

agriculture are still the same as they were in the time of the Pharaohs — animals and people. The donkey, the buffalo, and the camel are everywhere to be seen, and in the fields whole families are at work, young and old alike. And therein lies the problem: too often the women, children, and the old are the only help the farmer can get.

Unskilled farm labour is becoming increasingly hard to find in Egypt. There are the demands of the armed forces to answer, and a growing industrial sector tempts young men away from the land with the prospect of regular hours and steady pay. There are also offers of higher wages for labourers in neighbouring oil-rich countries. But perhaps more importantly, universal free education has raised the expectations of Egyptian youth, so that many are no longer content to stay as unskilled labourers on the land.

So there is a demand for mechanization for the small farmer, to make good the shortage of labour and to increase production. Intensive cultivation of crops such as rice, wheat, maize, sorghum, cotton, and many others is possible with year round irrigation and an average of almost ten hours sunshine each day. In fact, agriculture predominates Egypt's economy, earning almost 90 percent of the country's foreign exchange, yet occupying a mere three percent of the total land area. Most small farmers have holdings of only one or two hectares, far too small for conventional mechanization. The use of tractors by cooperatives for a large-scale mechanization program has met with limited success. This is in part because many of the tractors were equipped to perform only one or two operations, but also because tractors are expensive and must be imported.



Engineer Gaber El-Kashab explains the simplicities of 10hp mechanization.

Small-scale mechanization, portable and affordable, could be "the beginning of an agricultural revolution."



The power unit is adaptable to a variety of machines and uses. Here it is tested for irrigation pumping.

Photos: Neill McKee



Thresher in operation near Tanta, Egypt.



Enter the 10hp mechanization concept. Behera engineer Gaber El-Kashab is obviously proud of his machines. Although they are based on designs used in the Philippines and powered by a German-made diesel engine, they were adapted and built here in Alexandria. He has kept the modified designs as simple as possible, for easy maintenance on the farm. Their construction is tough, to withstand anticipated years of use. And they work, as El-Kashab demonstrates, first with a thresher, then a sprayer, a pump ... until the yard is filled with the sound of the little diesel engines. Fifty have already been built, and another 30 are now in production.

As part of the project, many of these prototypes are being tested in the field. Near the town of Tanta in the heart of the delta, engineer El-Kashab leads the way to a field where wheat is being harvested. Most of the labourers seem to be women and children. And in the midst of all the activity stands one of the little yellow Behera threshers, beside growing piles of grain and straw. The thresher, and others like it, is being evaluated strictly on performance. It will be tested for its harvest yield compared to the more traditional, labour-intensive methods; for the overall quality of the grain it produces; for its cost of operation and maintenance; and for its acceptability to the farmer. The other implements produced by the Behera team are undergoing similar testing all over Egypt under widely varying conditions.

The country has several distinct geographical areas that have different crops, cropping patterns, canal flows, in fact different micro-climates. Around Tanta, for example, the main crops are maize and cotton. Rice is a major crop in the heavy coastal soils, while in the more

arid regions of Upper Egypt, sorghum, grain legumes, and wheat are predominant.

Kamal Gabr is another Behera engineer. He is responsible for planning and quality control on the project, and like Gaber El-Kashab he is very enthusiastic about the 10hp mechanization concept. Certainly, he agrees, there have been "teething troubles" with some of the equipment, but that is to be expected in the development stages, and so far they have been able to keep well on top of the problems. The testing and evaluation on the farms is providing valuable data to help in the development of the machines.

He estimates the cost of the thresher would be about \$US2500, of which about half would be for the diesel engine. The present production line is small, capable of manufacturing about 200 units a year. If there is sufficient demand, however, it could quickly be expanded for mass production, says engineer Gabr. There is even talk of exporting the machines to other countries in the Middle East and Africa.

With its wide variety of crops and growing conditions Egypt is in many ways an ideal proving ground for a low-cost agricultural mechanization system that could be further adapted for use in other countries of the semi-arid regions. One day the little green and yellow machines may be a common sight not only on farms throughout Egypt, but over much of the continent. □

Bob Stanley, Senior Science Writer with IDRC, recently returned from a visit to project sites in Egypt.