Choosing for efficiency is choosing for the Borga-TNO flax hackle machine

Ter Borg & Mensinga's Machinefabriek N.V.

A bit of history

On the basis of many years of research and development, the Netherlands Fibre Institute TNO at Delft has developed a flax hackle machine for the process of decortication of green flax which can be called unique in comparison with conventional hackle machines.

This machine was further adapted to the dressing of scutched flax by Borga, manufacturers of processing equipment for agricultural products.

Why greater efficiency?

By adopting the method of horizontal flax conveying, the capacity of the machine was raised from 92 to 200 kg of scutched flax per hour. Moreover, hackling efficiency is 10 per cent higher, while the final product retains the same quality.

This is indeed a considerable saving. In this respect we refer you to the typical figures in the tables on page 4 of this leaflet.

Profile of the flax hackle machine

The machine is built up of a steel structure in which the pinblocks are housed in hacle compartments, which are closed with slide-windows.

The flax is conveyed into the machine and enters the first hackle compartment

The transport of the continuous flow of flax comes about by a specially constructed chain, which, together with an endless belt conducts the flax along the pinblocks for processing.

The machine can be divided into five main parts, which also indicate the routing of the machine, in numerical order:

1. **Loading table**
2. **First hackle compartment**
3. **Separating mechanism**
4. **Second hackle compartment**
5. **Take-off mechanism**

Operation of the machine

On the loading table the scutched flax is arranged before it is automatically conveyed to the first hackle compartment. Here the top parts of the horizontally moving flax stalks are hackled by means of vertically moving hackle-pins, which become of finer grade towards the end of the compartment. Next, the continuous flow of flax is divided by the separating mechanism into batches with a space in between of about 35 cm, so that after the hackle process is completed, the flax can easily be taken off by two employees in turn.

Simultaneously the flax stalks are pulled through sideways and taken over by a second conveyor chain, which takes care of transport through the second hackle compartment where the parts of the flax stalks are hackled that had not been done at the first stage.

After the hackled flax has left the second hackle compartment, the take-off mechanism transfers the batches to the autospreaders, which ultimately produce the coarse thread.

No air-pollution

The Borga machine has been constructed in such a way that the closed hackle compartments can be connected to the dust exhauster system normally present in flax processing factories.

Thus the fine dust is removed by suction. By maintaining a low vacuum the escape of hackle dust is prevented.

Uncomplicated operation

It is impossible to get the order in which parts are set into operation wrong, because the machine is equipped with a programmed switchbox.

Moreover, an emergency tripping mechanism has been installed, which can be operated from any position on the machine. At the option of the customer, the machine can be fitted with its own carbon-dioxide fire-extinguishing system, which automatically comes into operation as soon as smoke develops or a

rise in temperature occurs.

All bearings in the hackle compartment are sealed in such a way as to make them dust-proof. Moreover, provisions have been made to prevent the winding of the fibres around the revolving spindles.

The speed of both flax conveying and the hackle-pins are infinitely variable so that optimum hackling operation can be adjusted.

Removal of tow

The so-called tow (short fibres) is removed from the pin-blocks by rotating brushes and deposited on the moving belt under the machine through the customary system of comb cilinder and chopper. This belt takes care of further transport to the central waste outlet.

If required, the short fibres of both the top and root sections of the flax stalks can be collected separately. If separate removal of the coarser dust is desired, a special conveyor belt can be built into the machine.

Required number of operators

It takes two operators to feed the machine, while for removing the coarse thread produced by the autospreaders one man is required, who is not fully occupied.

With a combination of two machines, an important saving in the number of operators can be effected, because the removal of the coarse thread produced by four autospreaders can be done by one man.

This means that with this combination only five operators are needed instead of six.

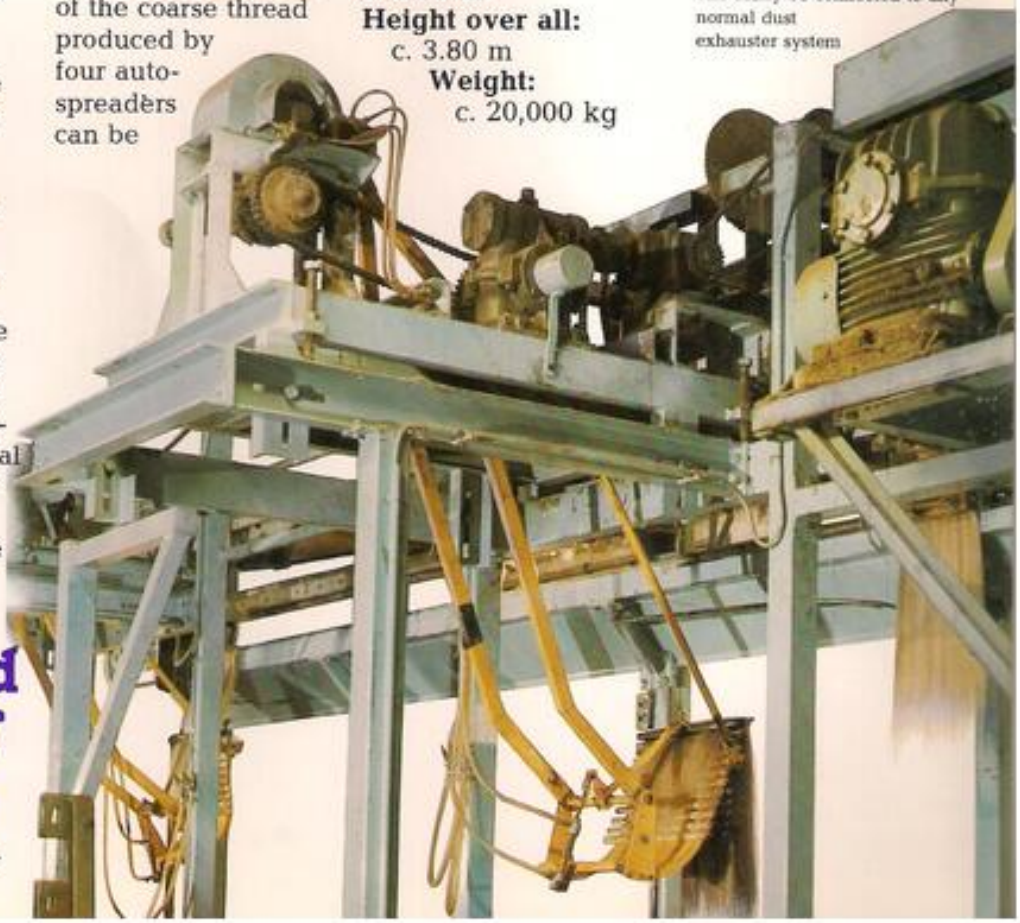
Specifications

Length over all:
c. 30 m
Max. width:
c. 1.85 m
Height over all:
c. 3.80 m
Weight:
c. 20,000 kg
Power installed:
c. 22 hp
Speed of transport:
from 3.6 to 7.2 m/min (infinitely variable)

Telling figures

The Borga hackle machine has been tested and compared with conventional machines in over 1600 hours' running.

The figures below are telling enough to justify contacting the experts of Borga, who will gladly show you the way to efficiency.



The closed hackle compartments can easily be connected to any normal dust exhauster system

Practice Results During 1600 hrs' Running

	Traditional system consisting of: 1 hackle machine 1 autopsreader		Borga system consisting of: 1 Borga-TNO hackle machine 2 autospreaders		Borga system consisting of: 2 Borga-TNO machines 4 autospreaders	
a. Number of operators	2.2		3		5	
b. actual output of hackle flax in kg per operator per hour	23		40		48	
c. Hackle efficiency:						
Long fibre	55%		60%		60%	
Short fibre (tow)	40%		37%		37%	
Waste	5%		3%		3%	
d. Number of man-hours at a supply of 1000 kg of scutched flax	23.9		15		12.5	
Calculation of savings compared with traditional system:						
At a supply of 1000 kg of scutched flax, the output is:	kg	market-value	kg	market-value	kg	market-value
Long fibre	550	550 A	600	600 A	600	600 A
Short fibre (tow)	400	320 A	370	296 A	370	296 A
Waste	50	–	30	–	30	–
Total market-value		870 A		896 A		896 A
Surplus value out of 1000 kg of scutched flax when using the Borga machine				26 A		26 A
Savings in cost of labour				8.9 B		11.4 B
Surplus output per 1000 kg of swingled flax with respect to the traditional system				26A+8.9B		26A+11.4B
In these formulas A = market-value of the long fibre per kg B = cost of labour per hour						
General information:						
Actual input capacity of scutched flax in kg /hr	92		200		400	
Actual output of hackled flax in kg/hr	50.6		120		240	
Number of machines required to produce the same quantity of hackled flax	4.7		2		1	

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Dealer:

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