

Decorticating Platform for long textile hemp fibres preparation

Synthesis of the project

My fifteen years old experience in hemp cultivation, decortication and valorisation fields, drives me from previous tasks, projects and self built operating lines (Start Hemp Mobile Decorticator, Chanvre Gardois Decorticating line, and more recently the DIY Hemp Decorticator of the Initiative Chanvre) to a synthetic concept and tool : the (hemp) Decorticating Platform.

This Decorticating Platform is especially dedicated to prepare long textile hemp fibres. That means the Decorticating Platform is integrating different phases and sequences of a whole complex process for the long textile hemp fibres preparation, while it is integrating also different forks and shortcuts expected to prepare technical fibres and compatible fibres for pulp industry.

On an economic point of view, some key topics have been structuring the designing of the Decorticating Platform as a tool that must be :

- a low cost investment line with low tech devices in order to be widely accessible to any hemp project, no matter on its fortune or its technicality
- scalable both on quantities operated and both on the range of qualities requested and obtained, in order for any user to develop and improve its business on the targets and on the pace he choose.
- Industrially efficient in order to be fairly and regularly operated with a minimum of 2 operators while producing the expected added value by thriving hemp companies in local hemp value chains

Basics of the process

Backed on previous experiences :

- Breaking, separating and refining the fibres are the main stages
- Mechanical operations are not adequate for textile preparation, additional chemical and biochemical processes are needed and may be added at different stages of the whole process
- roller breakers at the beginning for breaking the straw
- a winding device is operating at each end of the long fibres process sequences in order to maintain the organization of the material in an operative, efficient and approved packaging

Furthermore:

- there is already no industrial process dedicated for long hemp fibres preparation, as there is for flax by example
- From decades they have been many trials, most of them have been unsuccessful. But all of them have been creating a whole background that is now guiding the Decorticating Platform designing, showing us possible paths to success while warning from traps to avoid. A whole innovative process for long textile hemp fibres is now at hand.

Decorticating Platform prerequisites

The Decorticating Platform is designed for different raw materials at input within this range of straw :

- long hemp stem or long stem from other fibrous plant
- fresh green or dried straw
- retted or not retted hemp
- Straw usually packed in round balers or eventually in sheaves

The Decorticating Platform is expected to

- create a regular and calibrated flow of stems and fibres
- separate properly each by products :
 - o stones, earth, pieces of wood, plastics, etc...
 - o fibres
 - o shivs
 - o dust
- refine the fibre bundles

While accepting or integrating chemical and biochemical treatments/sequences (tank retting, dying, finishing...) in order to :

- refine the fibre bundles
- improve textile and functional properties of the fibres

The Decorticating Platform is expected to wind and unwind the fibers at the end and at the beginning of each different sequences of the process.

The Decorticating Platform is expected to produce:

- shivs available for building market, animal bedding market, mulching
- different kinds of fibres :
 - o from long textile hemp fibres and other intermediate textile fibres
 - o to a range of technical fibres
 - o and fibres for pulp industry

The Decorticating Platform is eco-designed to be environmental friendly and economically efficient, so it is expected to produce as less waste as possible and as low environmental impact as possible:

- any by-products will be valued :
 - o Dust as fertilizer, animal bedding
 - o Laden water from retting as fertilizer or raw material for methanation or green chemistry
- We focus on sustainable process and products when chemical process added

The Decorticating Platform is designed around a base module in order to operate the different sequences of the whole process with different and successive tools and options, at its experimental phase and also for any laboratory needs or very low investment possibilities by example.

The Decorticating Platform is designed around a base module and different tools and options to make it scalable, adjustable, and flexible in order to satisfy most of the development and improvement needs expected by our clients along the growing extend of their activities and business.

Targeted markets, related input raw material qualities and dedicated processes

Decorticating Platform is designed to decorticate and refine any kind of hemp straw identified above into different kinds of outputs:

- fibres in order to provide :
 - o Textile industry
 - o Technical fibres industry
 - o Pulp industry
- shivs available for
 - o building uses and markets
 - o animal bedding and mulching markets
- dust and by-products as :
 - o raw material for green chemistry
 - o fertilizer for agriculture
 - o raw material for methanation

But, even with the versatile opportunities to operate with the Decorticating Platform, each chosen output needs a dedicated input raw material, usually:

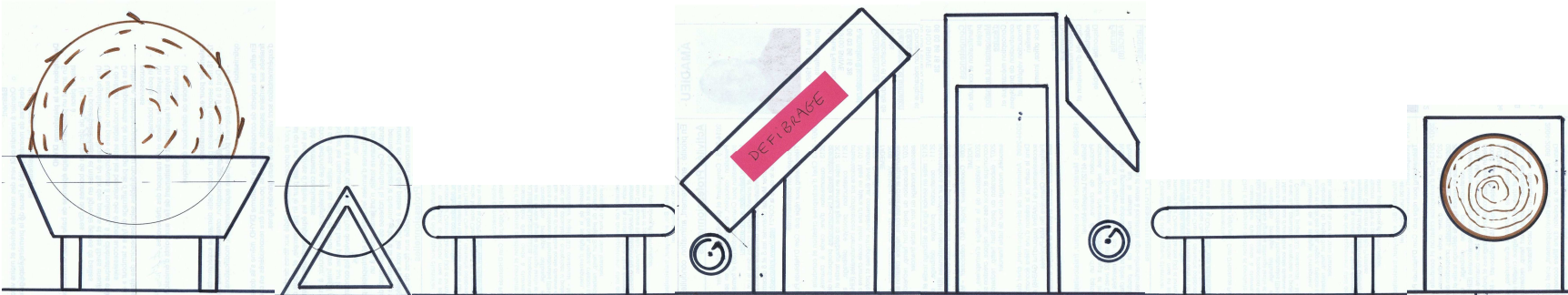
- water retted hemp for textile
- on field retted hemp for technical uses
- non retted hemp for pulp industry

Related to the products targeted and their raw material dedicated, there will be 3 different process integrated by the Decorticating Platform :

- long textile hemp fibre process
 - o that needs numerous sequences with almost 100% of specific Decorticating Platform devices
 - o that integrates or needs water retting and finishing process
- Technical fibre process
 - o That needs at least 2 different sequences
 - The first one similar as the long textile fibre process
 - A second one with a mix of conventional devices and Decorticating Platform specific devices
- Pulp compatible fibre process
 - o One single sequence
 - Started with Decorticating Platform specific devices
 - Concluded with same conventional devices than textile fibres

Overall and operating sketches of the Decortivating Platform and its 3 different processes

DECORTICATING PLATFORM long textile fibres Process 1rst passage breaking/separating/winding



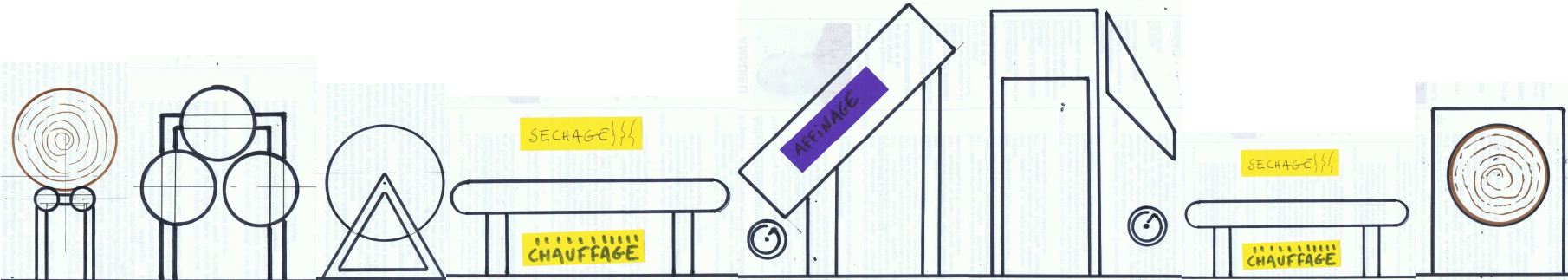
1 RB unwinder 2 straw drummer 5 Conveyor 6 screw 7 Roller breaker 8 Lisseur 9screw 10 Conveyor 11 Winder

Input mobile device

core part of process

long fibre output

DECORTICATING PLATFORM long textile fibres Process Passage 2/3/4 after retting heating and drying
Passage 5/6/7 after finishing packed in reels or tops



3 Reel unwinder 4 wringer 2 straw drummer 5 Conveyor 6 screw 7 Roller breaker 8 Lisseur 9screw 10 Conveyor 11 Winder

Input mobile device

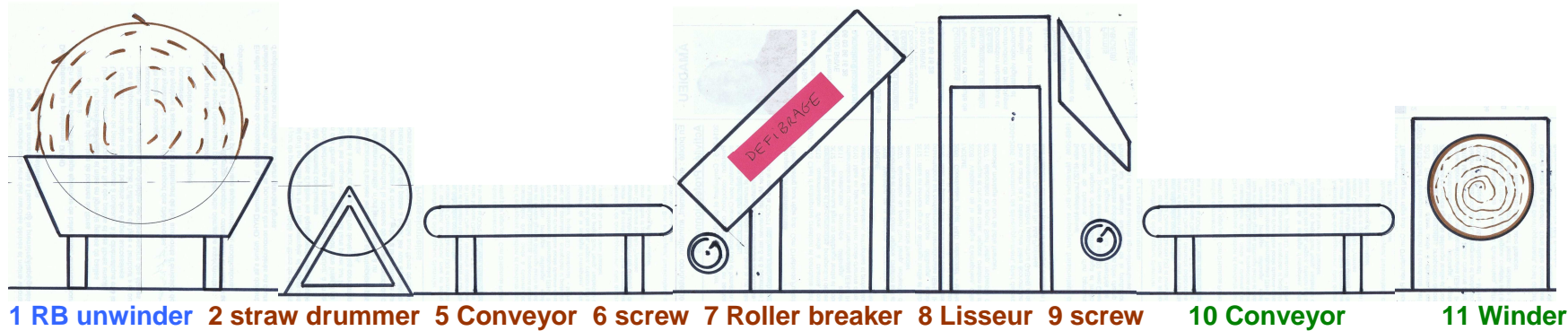
core part of process

long fibre output

DECORTICATING PLATFORM Technical fibres Process

1st passage

breaking/separating/winding



1 RB unwinder

2 straw drummer

5 Conveyor

6 screw

7 Roller breaker

8 Lisseur

9 screw

10 Conveyor

11 Winder

Input mobile device

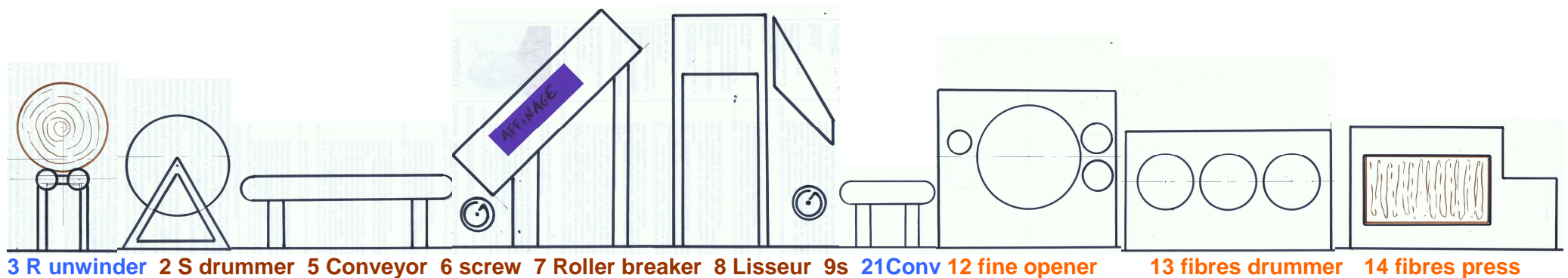
core part of process

long fibre output

DECORTICATING PLATFORM Technical fibres Process

2nd passage

Refinining



3 R unwinder

2 S drummer

5 Conveyor

6 screw

7 Roller breaker

8 Lisseur

9s

21 Conv

12 fine opener

13 fibres drummer

14 fibres press

Input mobile devices

core part of process

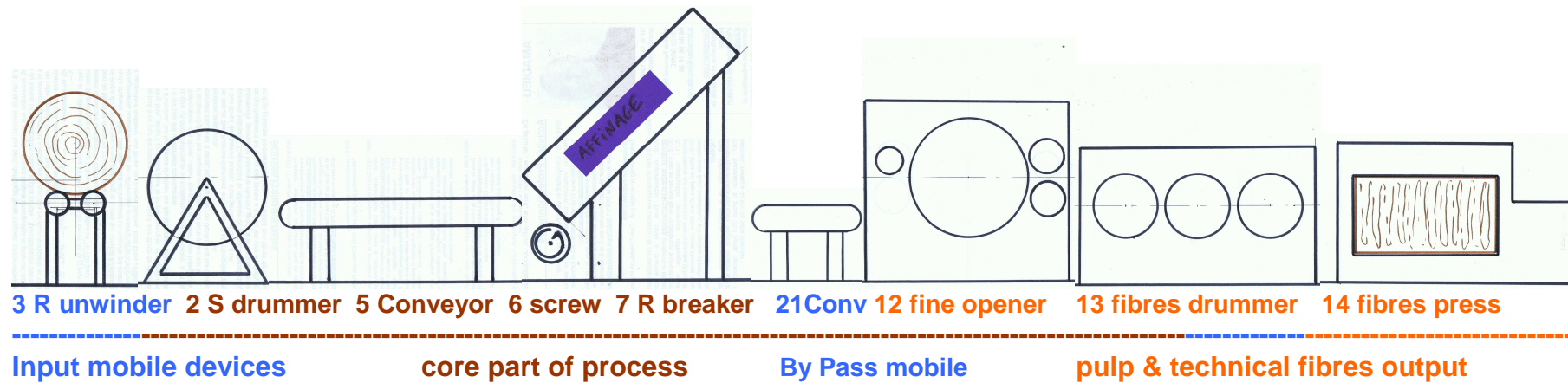
By Pass mobile

pulp & technical fibres output

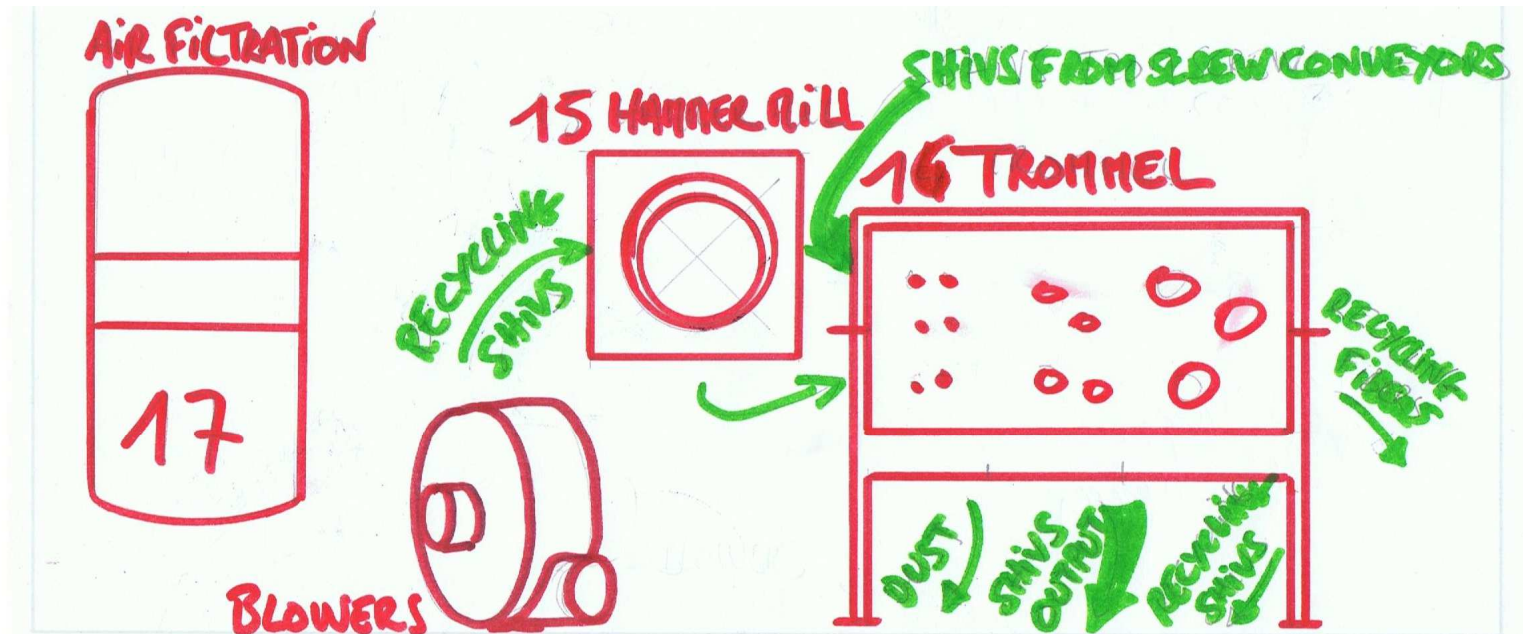
DECORTICATING PLATFORM Pulp compatible fibres Process

single passage

Decortivating



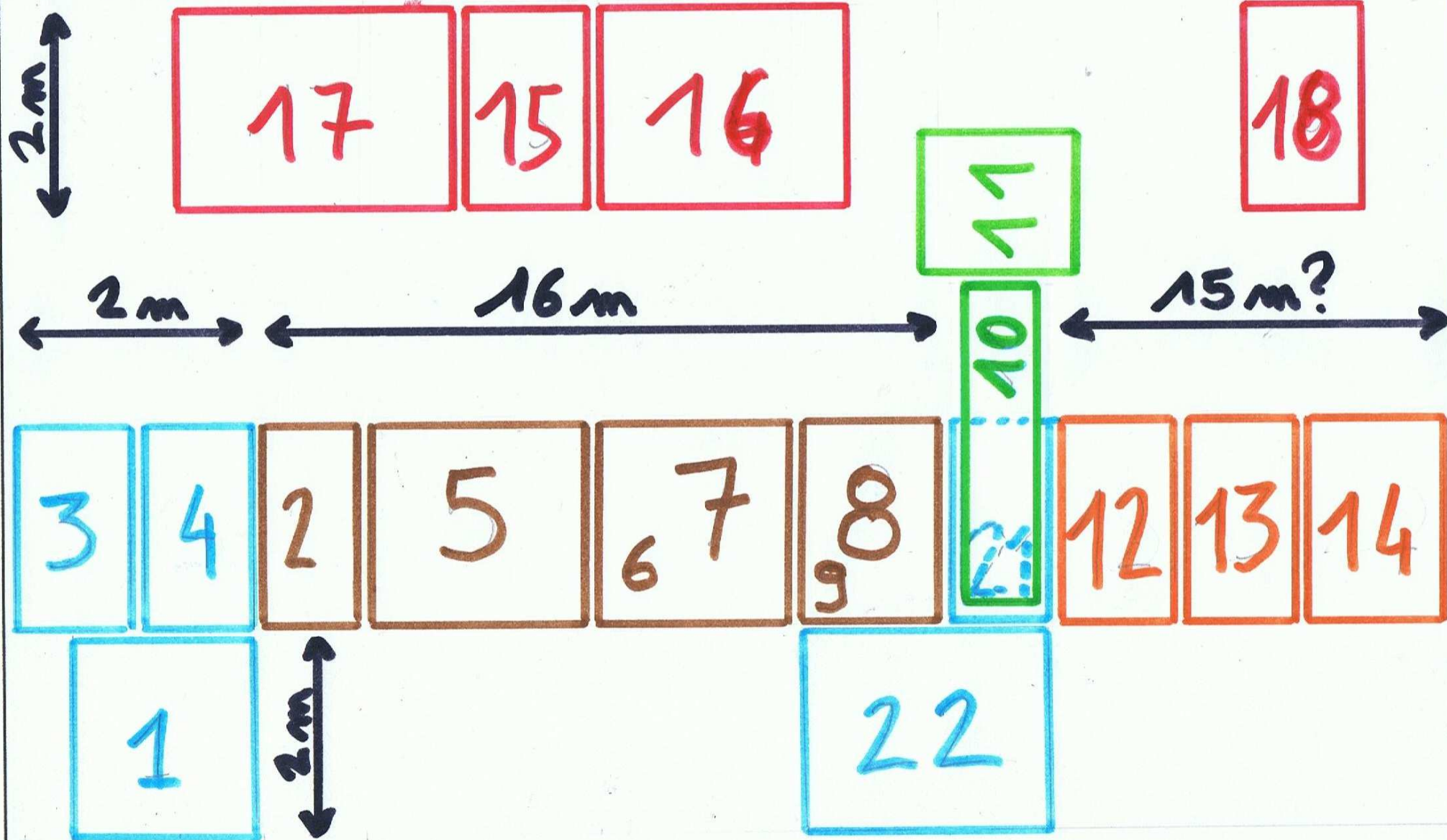
DECORTICATING PLATFORM shivs preparation devices and air filtration



PLATEFORME DEFIBRAGE

VUE DE DESSUS

Tous équipements



General information and warnings

The Decorticating Platform plant at its industrial complete development may need about 400 m². This is not including storage of raw material and byproducts but only the building for operating the straw.

In this document are not developed neither tank water retting, nor finishing fibres

More detailed report and information are ongoing, and should be available by the end of september. The results of the trials to be run this summer will contribute to bring further details on the Decorticating Platform.