



DISCOVERING THE WORLD OF **MALT.**

 VIKING MALT

BARLEY DEVELOPMENT FOR MALTING USE

#1 WEBINAR

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Screening and approval proces of malting barley varieties

Aims at bringing new malting
barley varieties that have
been sufficiently tested and
adapted for malting use.



Typically, there is an official group of professionals (breeders, scientists, agronomists, brewers, maltsters, other specialist) **who**

- ① **defines** and updates the breeding **targets** and screening criteria
- ① **follows** the breeding results
- ① follows and **evaluates the results** of growing and micro malting results
- ① **selects** varieties to industrial scale trials
- ① follows and **collects results** for industrial scale trials
- ① **approves** varieties for malting barley use

What are the breeding targets?



FARMING PROPERTIES

- varieties with different growing time
 - good and firm straw (lodging properties)
 - robust to annual variations of growing conditions
 - resistant to plant diseases
 - good resistance to *Fusarium*
 - low nitrogen pickup when growing
 - environmentally sustainable production
 - **big and homogeneous grains**
 - low pregermination tendency
- RELIABILITY



PRODUCTIVENESS FROM FIELD

- high yield with malting barley quality
- big size and number of kernels in ears

What are the breeding targets?



PROCESSING

- beneficial dormancy properties
- **homogeneous grains**
- **mealy endosperm**
- **rapid even** water uptake (hydration)
- **balanced** proteolysis versus cytotoxicity
- varieties with different **enzyme levels**
- good brewing behaviour**



ECONOMY

- high malting yield
- high brewhouse yield
- high alcohol yield
- good and durable husk
- short processing time



QUALITY

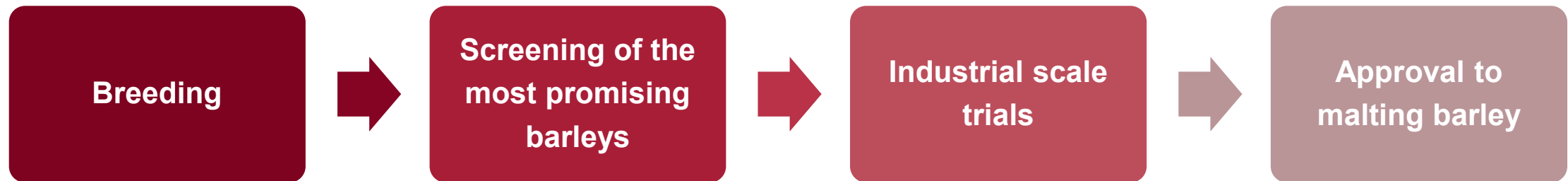
- beneficial food safety properties
- **good stability of beer**

**NEW malting barley variety
needs to be accepted and
wanted by:**

- ✓ farmers
- ✓ maltsters
- ✓ brewers
- ✓ and distillers!



Screening and approval process of malting barley varieties is a time consuming process



→ Time period even up to ~10 years + marketing ←

Why it takes so long time?

- **NO GMO IN USE!**
- **ALL DEVELOPMENT GOES NATURAL WAY!**

Year	Example of actions	Decision
1	Breeders crosses plants and crows several potential new comers in a very small scale.	Some continue
2	Seeds selected from previous step are studied further.	Some continue
3	Kernels with the best features are grown to increase the amount of seeds. All features related behavior in a field are studied as much as possible including growth test in different locations.	Some continue
4	Enough seeds to do first micro maltings. Wide study related to malt quality and wort quality. Research on other quality and performance aspects continue.	Some continue
5	Micro malting tests with related studies are renewed. Kernels with the best features are grown more and studied more. Research on other quality and performance aspects continue. Brewing tests.	Some continue
6	Malting tests with increased batch size, brewing tests. Kernels with the best features are grown more and studied more. Research on other quality and performance aspects continue.	Some continue
7	The best candidates are grown in various location and amount of specific candidate kernels are increase. More pilot scale tests and first industrial scale trial is done or getting prepared for it. Research on farming properties continue all the time.	Some continue
8-9	Industrial scale trials. Study of performance in every aspect.	Some continue
10	Evaluation of result, farming, malting, brewing, distilling.	Accepted/Not

Continuos development is needed

After such a long time everything may end up in an observation and decision that the variety does not match all the expectations fully, and will not come out to markets.

→ reason why there needs to be new varieties and possibilities in a test row all the time!!
Someone needs to think farsighted.



Another reason for continuous development is:

- varieties accepted earlier years has a tendency to degenerate
- as years pass through varieties tend to come uneconomical in some perspective

What does brewer want from the new variety and malt from it?



- Big, uniformly sized kernels
- Protein level between 10-11%
- Good enzyme activity in base malts
- Good modification
- No loose husks
- No dust

Brewer expects that malt has always the same quality and performance!

Customer buying beer should not notice any difference between batches or crops.

What does maltster want from the variety?

- Barley needs to be uniformly sized, big kernels
- No tendency for long lasting dormancy
- Moisture under 14,5%, well dried quickly after harvesting
→ Still having minimum 95% germination capacity
- Protein level (9)10-11(11,5)%
- No tendency for broken kernels
- No tendency for loose husks
- Low need of water
- Short malting process time
- Good malting yield together with good modification
- Good enzyme activity for malts in which it is wanted feature

Sourcing our raw material for craft use

KEY POINTS

- We buy only contract grown malting barley.
- Our traceability is easy when grains are transported directly from the farms to the maltings.
- We actively develop and test new varieties together with breeders, farmers and customers.
- Clean environment and good climate with proper seasons lead to low contamination levels and safe raw material.
- We create added value by using varieties and qualities that are preferred by the customers.

MALT TYPE	FINLAND	POLAND
Pilsner and Pale Ale	Tipple, Harbinger, Planet, Trekker	Explorer, Propino, Planet
Zero* Malts	Charmay and Charles	Charles and Chanson
Special Malts	Tipple & Harbinger	Malwinta, Propino, Explorer
Enzyme Malts	Polartop & Pekka	-

*Zero malts are produced from the so called null-LOX varieties. Those varieties are missing the certain enzyme called Lipoxygenase. This enzyme is needed in enzymatic oxidation of beer that mainly cause the papery flavor during aging. By using Zero malts the shelf-life of beer can be improved and fresh taste lasts longer.

Why malt from barley is exceptional for brewing in a first place?

- Optimal relationship between **protein and starch**
- **Enzyme** systems are unique
- **Husk** protects the kernel during process and later it works as filter aids
- Ability to develop **flavor combinations** suitable and wanted for beers



Six-row or two-row malting barley

Six-row



- Higher Enzyme Content
- Higher Protein
- Lower Extract

Two-row



- Lower Enzymes
- Lower Protein
- Higher Extract

All Viking Malt production for brewing use is based on two-row barleys. One winter variety in use, rest being spring barleys. For distilling use one six-row variety is in use.

Viking Malt owns barley variety development project that got in goal lately.

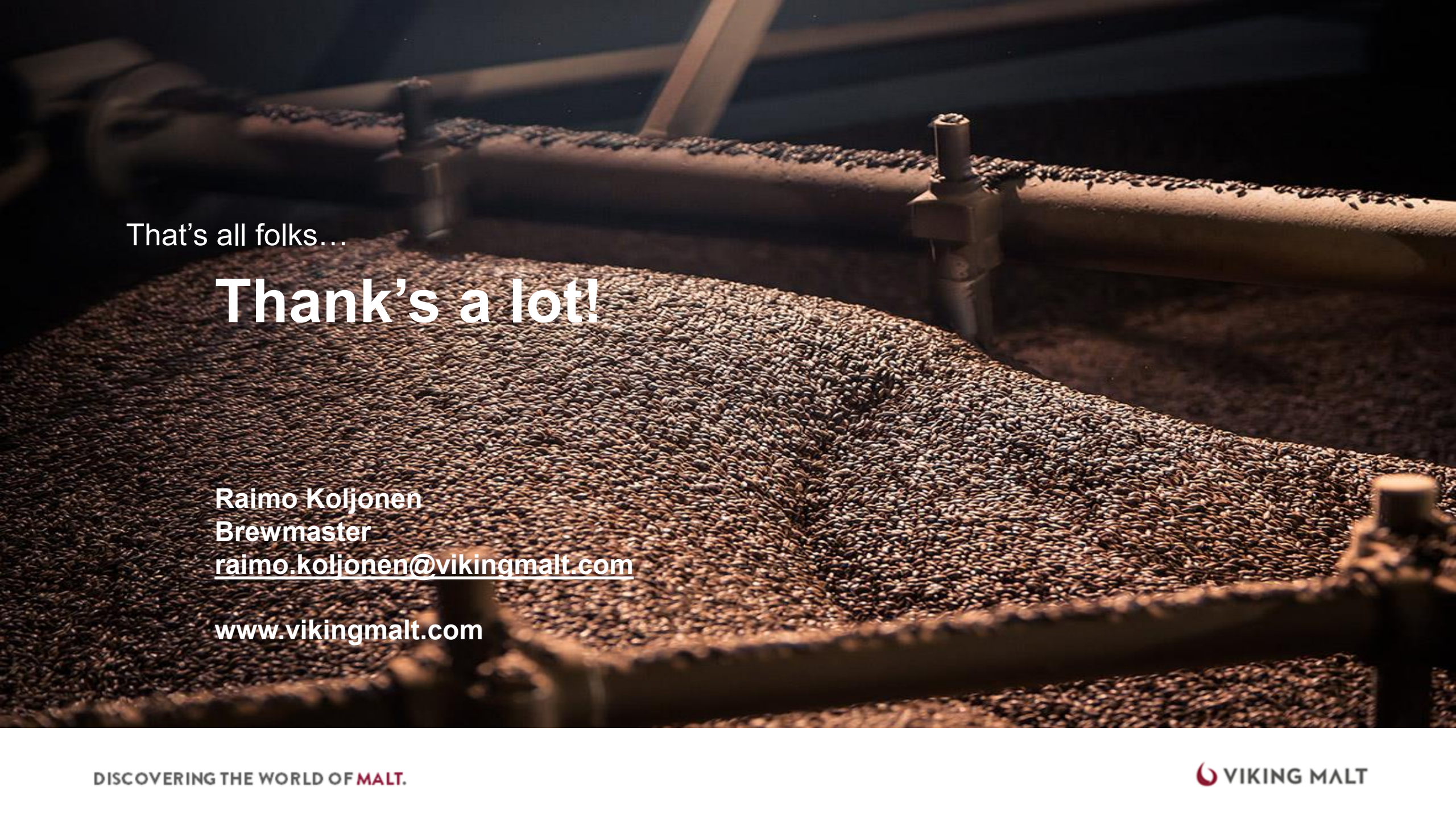
"Pekka" - breeding project targets

- A novel very high amylase - low GN malting barley variety tailored to fit the business needs of Viking Malt
- New varieties were planned replace two old HDP varieties in use in Finland (Saana and Polartop)
- The produced varieties are to be reasonably equal to the respective current varieties in terms of agronomic performance, grain and malting quality
- Project started in 2009



Outcome of the project = new varieties selected

- Based on project results three different varieties were selected and started the seed production in crop 2014 in Finland. Targets were full filled
- New varieties were named: **Popekka, Repekka and Vipekka**
- From the crop 2017 we got enough volumes for big scale production
- Viking Malt has exclusive rights to those three varieties
- Varieties are in successful use both in brewing and distilling applications



That's all folks...

Thank's a lot!

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VIKING MALT

MALTING PROCESS

#2 WEBINAR
03 | 06 | 2020



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