



THE SWAEN

MAKING MALT A CRAFT

SINCE



1906

RICHARD SENNETT: THE CRAFTSMAN (2008)

Professor of Sociology at the London School of Economics and former University Professor of the Humanities at New York University. He is currently a Senior Fellow of the Center on Capitalism and Society at Columbia University.

AMBACHTELIJKHEID STAAT VOOR EEN BLIJVENDE, BASALE MENSELIJKE NEIGING: HET VERLANGEN OM WERK GOED TE DOEN OMWILLE VAN HET WERK ZELF, WAARDOOR WE VAARDIGHEDEN ONTWIKKELEN EN GERICHT ZIJN OP HET WERK IN PLAATS VAN OP ONSZELF (vergelijkt hij de diepe verbanden tussen materieel bewustzijn en ethische waarden, en ondergraaft hij algemeen aanvaarde ideeën over wat bijdraagt aan goede arbeid)

CRAFT STANDS FOR A PERMANENT, BASAL HUMAN TENDENCY: DESIRE TO WORK WELL TO DO FOR THE SAKE OF WORK ITSELF WHEREBY WE DEVELOP SKILLS AND AIMING AT WORK RATHER THAN ON OURSELVES (he compares the deep connections between material consciousness and ethical values, and he undermines generally accepted ideas about what contributes to good work)

THE SWAEN

PART 1

HISTORY OF THE SWAEN AND PRESENTATION OF PRODUCTION FACILITIES



Brewing Supply Awards



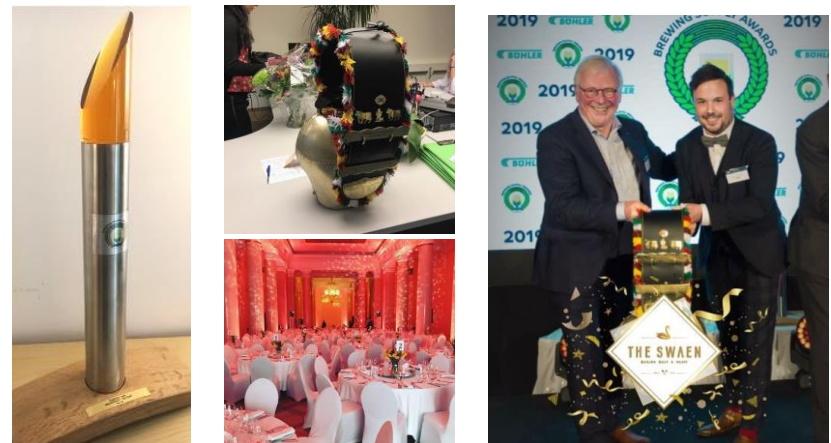
- The global brewing supply awards shines a light on the most innovative businesses in the industry by promoting success, innovation and ethics in the global malt, barley, beer and hops business community.
- These awards will go to the most outstanding company that best demonstrates exceptional financial returns, strong growth and innovation strategies, and market leadership in its sector. Judges will look for evidence of inventiveness, ethical credentials, good stakeholder relationships and long term planning balanced by the flexibility to deliver consistent results in dynamic market conditions.



2017: Bronze



2019: GOLD!



**THE SWAEN WINNER OF THE BRONZE MEDAL 2017 AND GOLD MEDAL 2019
IN THE BREWING SUPPLY AWARDS „BEST MALSTER OF THE YEAR“**

30
PROFESSIONALS

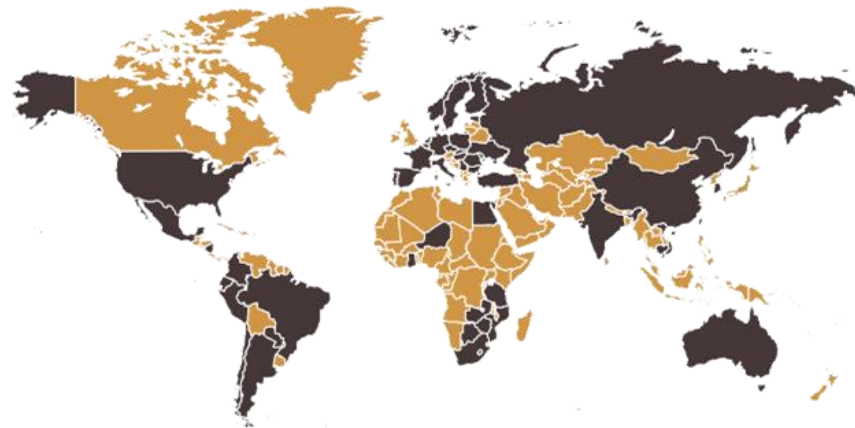


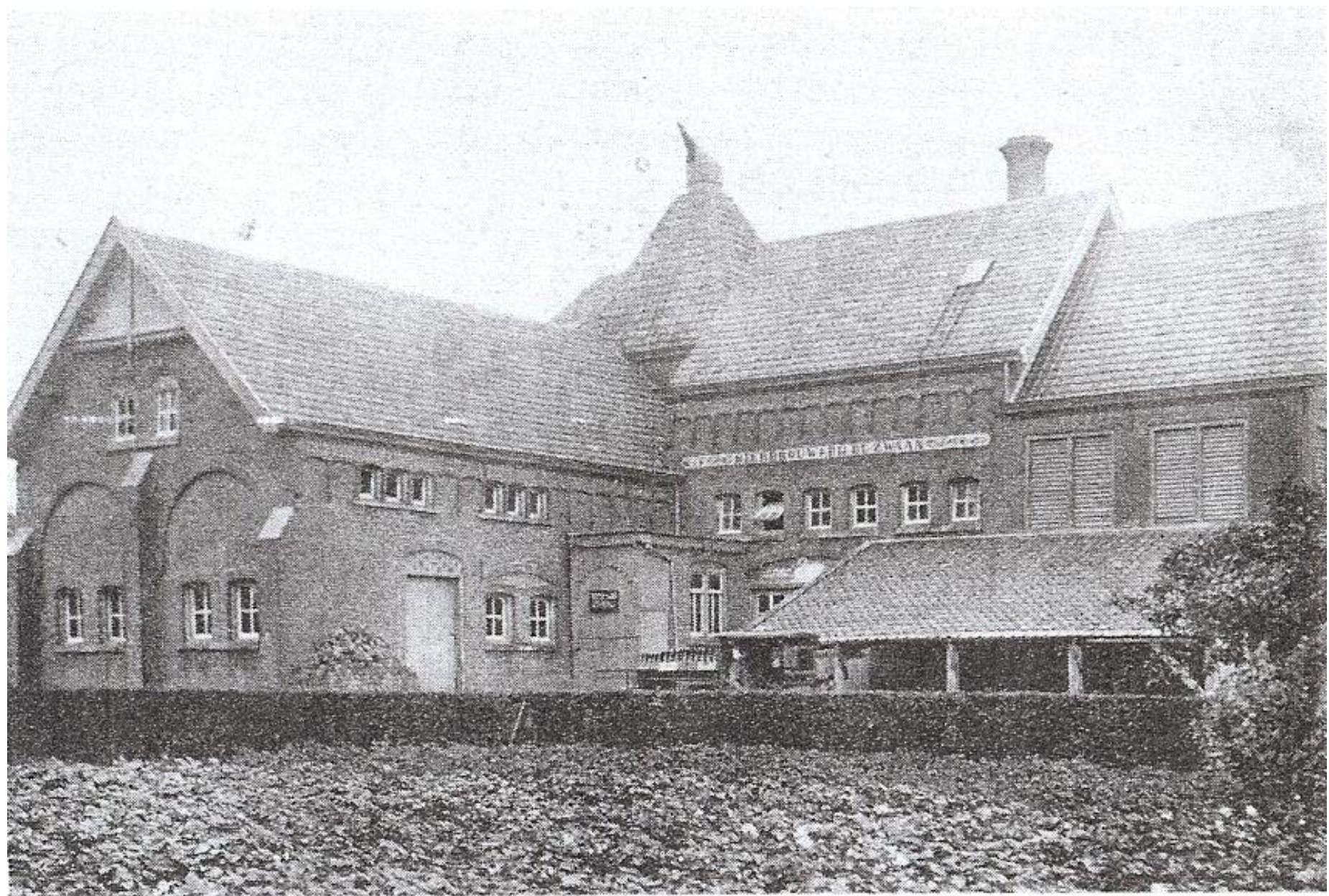
51
DIFFERENT
QUALITY MALTS

EXPORT TO
48
COUNTRIES



30 000
TONNES ANNUAL
PRODUCTION CAPACITY





Bierbrouwerij "De Zwaan"



HISTORY OF THE SWAEN

1906

A year with super inundation of the Scheldt in 1906 is also the year of Jos Buysrogge & Aloijs Adriaansen who have erected **Bierbrouwerij De Zwaan**

1923

Joos Menu buys the brewery

1939 – 1947

Brew kettles "dismantled" and brewing activities stopped definitely in 1948





1948 - 1988

In the 60's and 70's the malt capacity is enlarged to the current 25.000 ton
"Mouterij Menu" becomes the most important commercial maltster from The Netherlands



1988

Menu family sells the Malthouse to IBIS

GROWING *Grolsch*

1999

Grolsche Bierbrouwerij buys "Mouterij Kloosterzande"



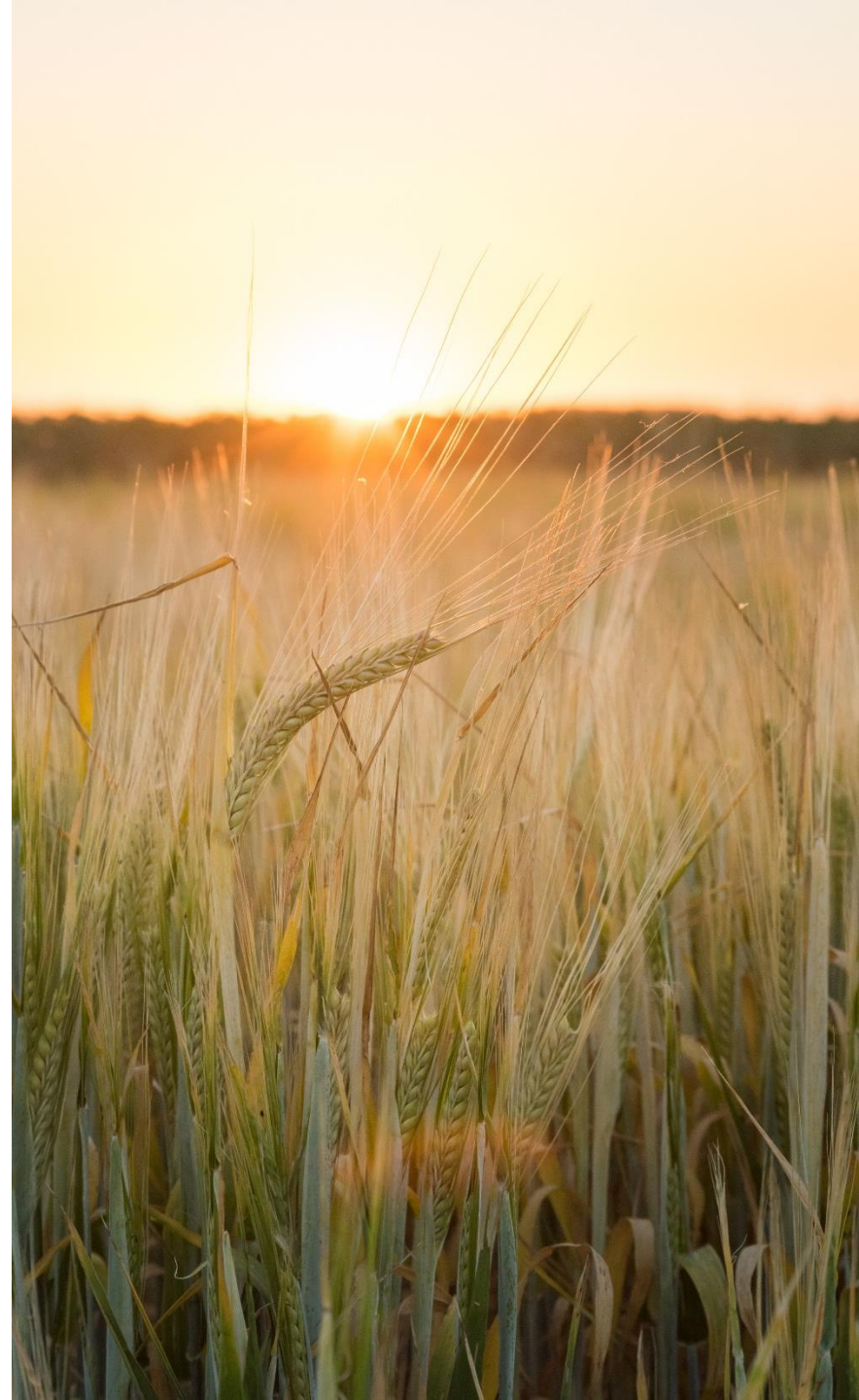
- The de Groen family acquire the Malthouse in joint venture, uniting world-leading tradition and expertise
- In 2018 the family takes over 100% of the company in order to pursue its success stand-alone

2013

THE SWAEN
REBORN!

GROWING THE SWAEN

“Since 2001 The Swaen works closely together with the Top Growers from Zeelandic Flanders. From this cooperation “Growing The Swaen, was initiated and is focussing on sustainable agriculture.”



GROWING THE SWAEN

Mijn brouwergerst

The Swaen

Mijn brouwergerst		
Telnummer: 164	Naam: Wilfried Bral	Teeltjaar: 2017

Brouwergerstperceel

Brouwergerstras	Paustian
Perceelsnaam	12 joos mel
Areaal in ha	4,45

Brouwergerst in bouwplan

Omvang akkerbouw	tussen 80 en 100 ha
Aandeel maaivruchten	tussen 40% en 50%
Plaats brouwergerst	Vaste teelt in bouwplan

Teeltresultaat

	Mijn teelt	Regiogroep
Opbrengst kg/ha	7476	7768

Volgerst	96%	92%
Korrelgewicht (dkg) g	51	48
Eiwitgehalte	11,7%	11,1%
Vochtgehalte	15,5%	14,3%
Gedroogd na oogst	nee	6%
Legering (opbrengst)	nee	6%
Doorwas (opbrengst)	nee	6%

Bijzonderheden

	Mijn teelt	Regiogroep
Schot	nee	0%
Zwarschimmels	nee	0%
Fusarium	nee	0%
Kafbeschadiging	nee	0%
Gebroken korrels	nee	6%
Legering (kwaliteit)	nee	0%
Doorwas (kwaliteit)	nee	6%

Bodem als basis

	Mijn teelt	Regiogroep
Voorvrucht	tarwe / haver / rogge / gerst	
Afslibbaar	25%	23%
Organische stofgehalte	2,0%	1,3%
Waterhuishouding	goed	redelijk
Storende lagen	nee	19%
Slempgevoelig	nee	38%
Structuur	goed	goed
Verdichting	nee	13%
Biologische activiteit	goed	goed
Beworteling bij bloei	goed	goed

Gewasstructuur

	Mijn teelt	Regiogroep
Conditie zaaibed	goed	goed
Opkomst schatting	82%	86%
Zaaiomstandigheden	goed	goed
Opkomst zelf berekend	87%	87%
Zaaizaad kg/ha	155	168
Zaden per m ²	280	307
Planten per m ²	250	246
Aren per plant	4,5	4,3
Aren per m ²	850	854
Korrels per aar	25	23
Korrels per m ²	21000	19167

Bemesting

	Mijn teelt	Regiogroep
P - startgift	nee	25%
N - behoefte gewas	190	145 kg/ha
N - aanbod totaal	195	181 kg/ha
N - bemest kunstmest	100	103 kg/ha
N - bemest org. mest	0	15 kg/ha
N - uit org. mest eerder	25	18 kg/ha
N - uit mineralisatie	35	19 kg/ha
N - uit bodemvoorraad	35	25 kg/ha

Gewasbescherming

	Mijn teelt	Regiogroep
Problemonkruiden	nee	25%
Herbiciden	>4	2,6
Fungiciden	1	1,2
Insecticiden	1	0,4
Groeieregulator	ja	100%

* = Percentage in regiogroep met indicatie "Ja".

Berekeningsdatum: 2-Feb-18

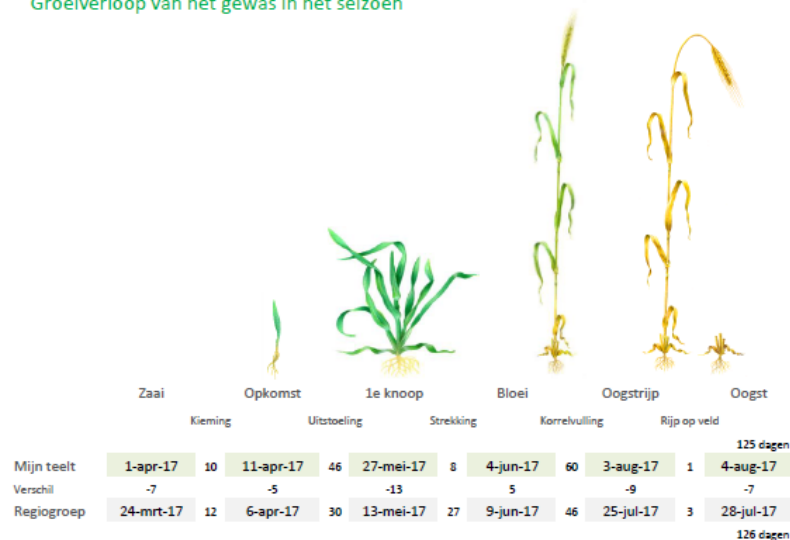
Regiogroep: Zeeuws Vlaanderen

Mijn brouwergerst

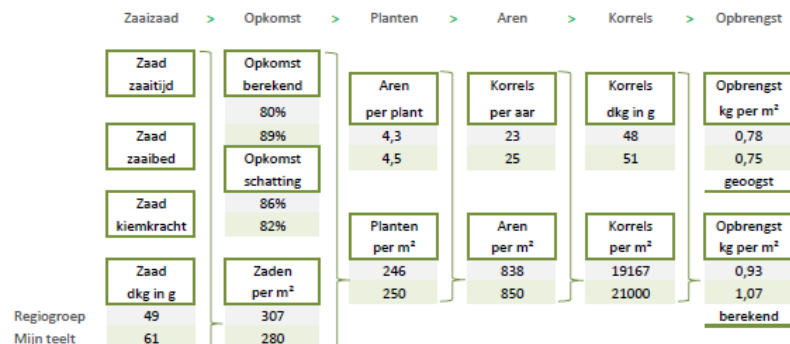
The Swaen

Mijn brouwergerst		
Telnummer: 164	Naam: Wilfried Bral	Teeltjaar: 2017

Groeiverloop van het gewas in het seizoen



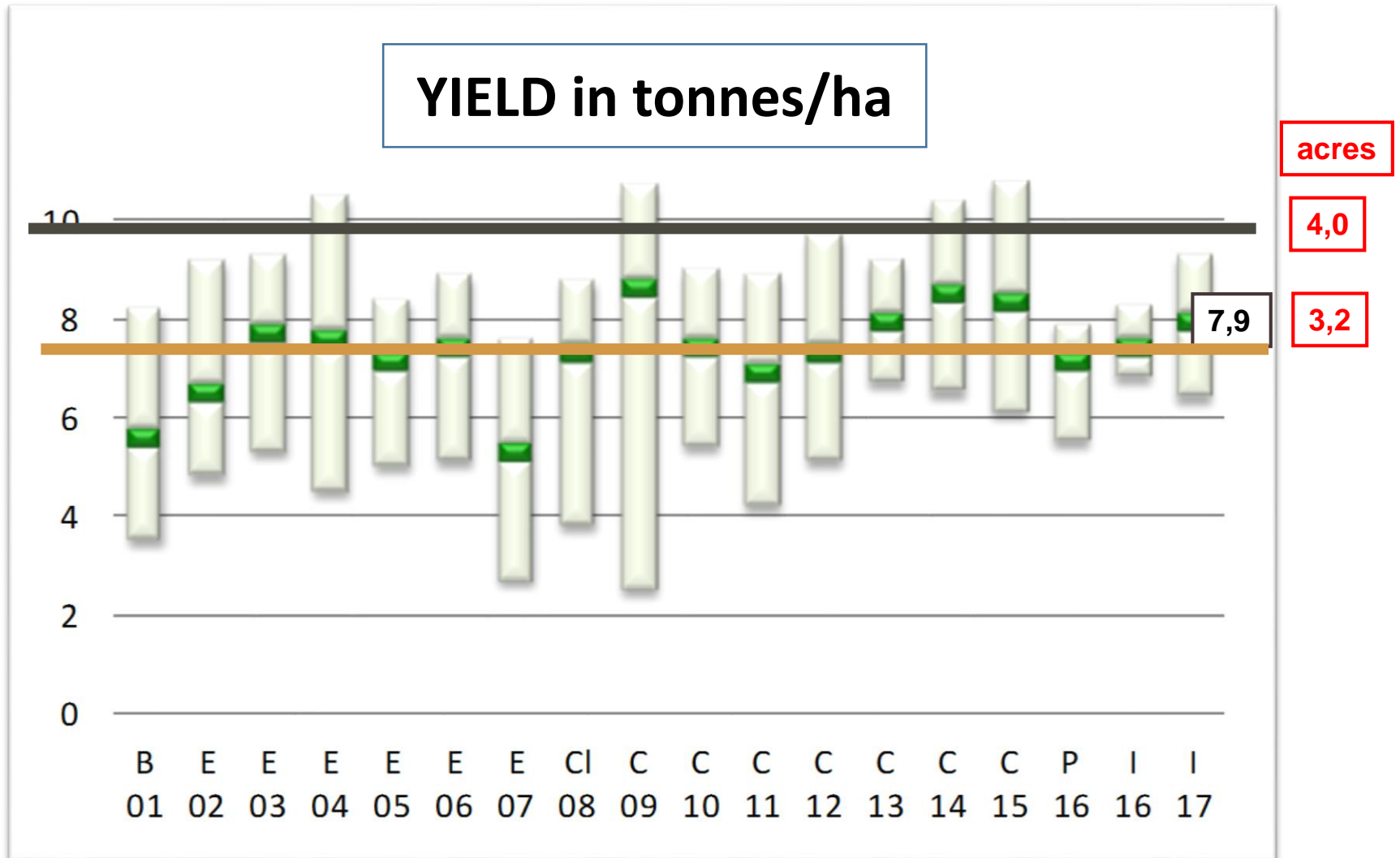
Structuur van het gewas dit seizoen



Berekeningsdatum: 2-Feb-18

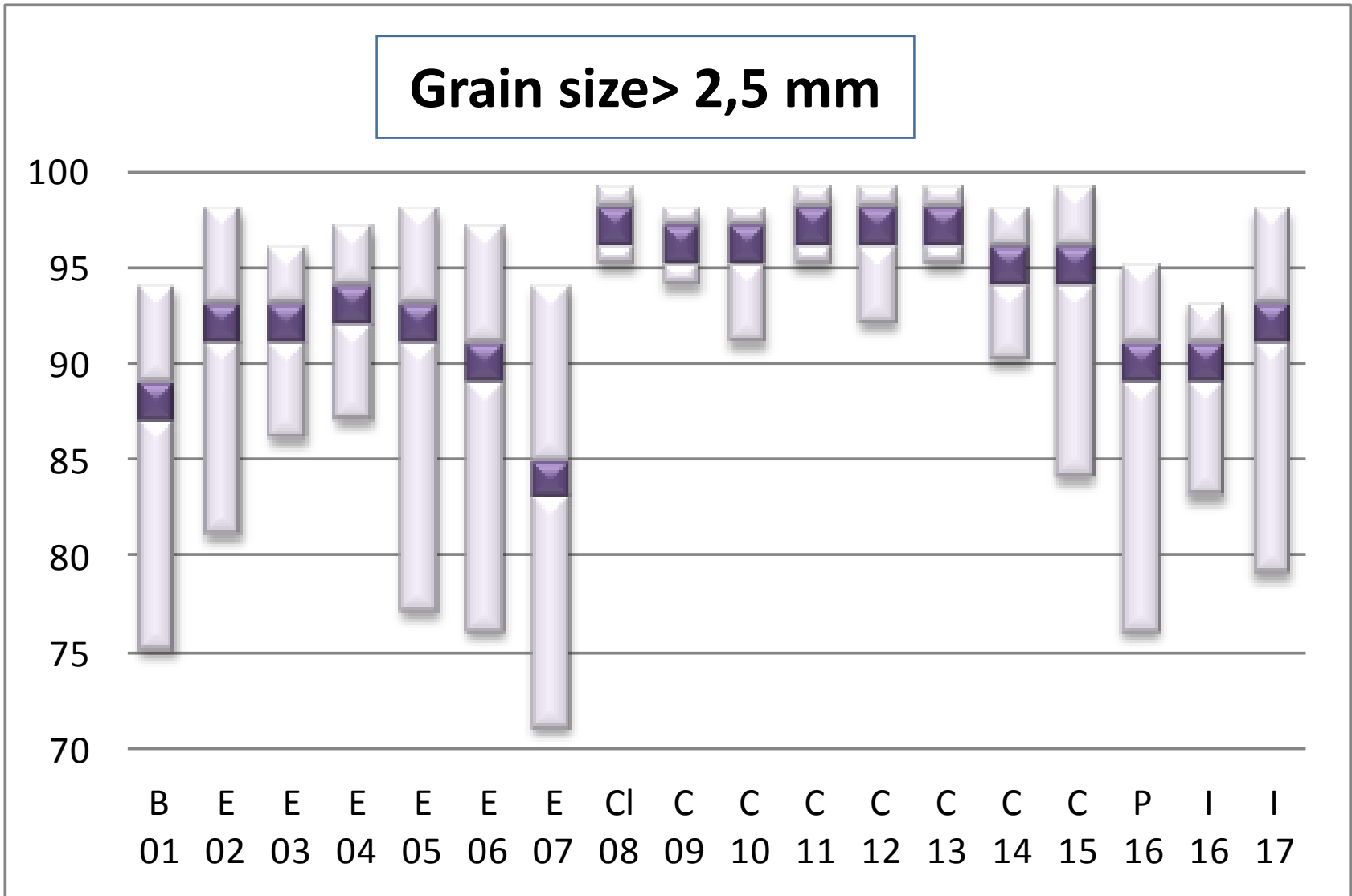
Regiogroep: Zeeuws Vlaanderen

GROWING THE SWAEN



GROWING THE SWAEN

Grain size > 2,5 mm



Harbour Walsoorden 12500 ton barley storage

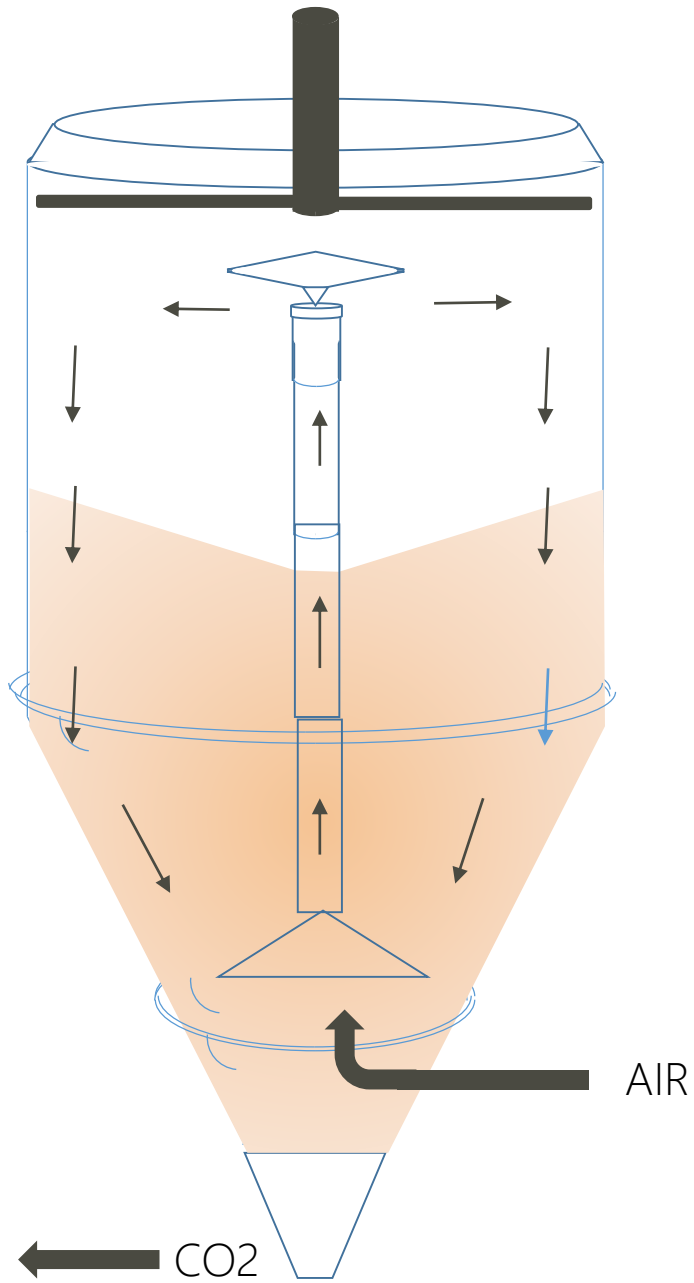


BASE MALT PRODUCTION

Malt is a dried and pre-germinated (sprouted) form of a grain or cereal wherein the starch has been modified;

most used cereal: **barley**; followed by **wheat**, also a bit **rye**; and further some **spelt** and **sorghum**

- Classic – Pilsner -Base
- Raw material is **BARLEY** 98%, Wheat and Sorghum
- **Cleaning – sorting / steeping 36h / germination 4x36h / kilning 36h**
- Time: 7,5-9 days
- Big and very big batch sizes 125(→600) ton
- Only made in O₂-rich environment
- TYPES: lager, pils, ale, vienna, munich



CONICAL STEEP VESSEL

1 ST wet steep 4 - 6h	14% → 28%
Dry steep 12 - 18h	28% → 30%
2nd wet steep 2 - 4h	30% → 40%

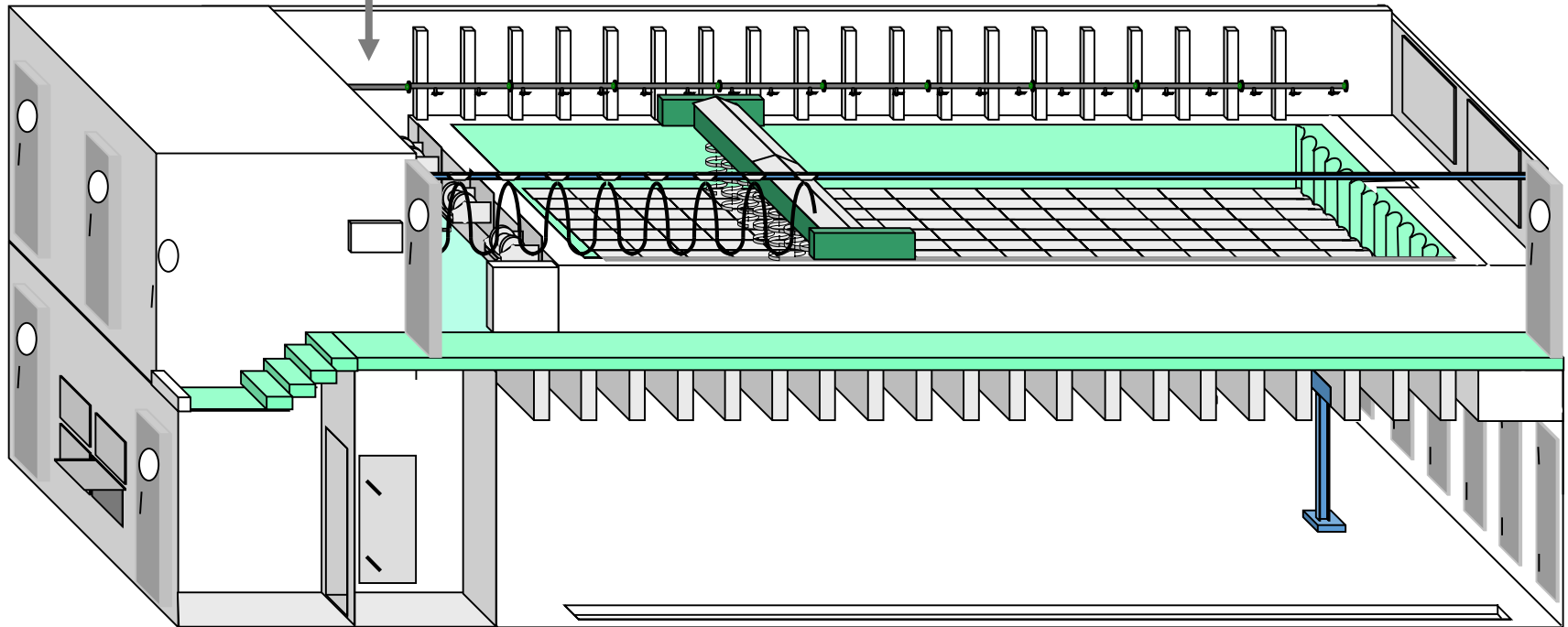
Temperature ideal 12°C
max 22°C

GERMINATION KILNING VESSEL (kiem-eest kast)

120 t

TIME 4,5-6 DAYS
1st DAY 40% → 45%

Temperature
18°C → 13°C



Kiln time aprox 32h
moisture 42% → 4%

Temperature
55°C → 85°C

16 ha malting barley growing = 125 ton barley = 100 ton malt = 7000 hl beer +/- 100.000 crates





Co-generation plant
1200kW

Barley in take silo:
capacity of 12* 200t

Effluent treatment plant
300m³/day

GKV1-4 each capacity of 6.000 t/year
GKV1-4 each capacity 125t /batch
Germination 4*36 hours
Killing 36 hours

Malt storage bins 25* 200 t

Steeping 36
hours

malt pellet storage 60t

Malt out loading bins 3 x 30t

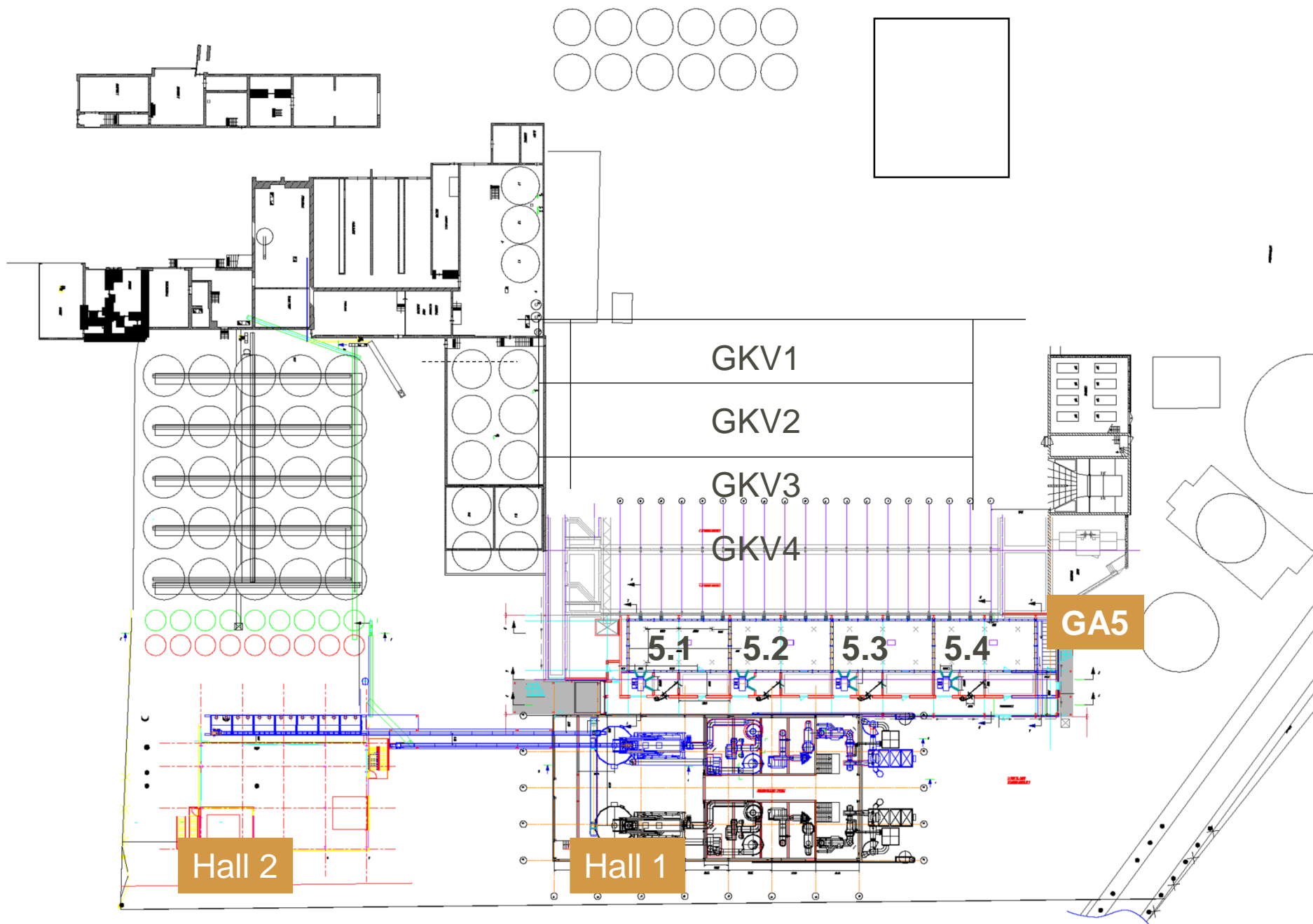
Malt out loading bins 3 x 45t



HALL 2

HALL





DRUM ROASTING PROCESS

- Special – all cereals

-
- Raw material: **GREEN MALT**,
 - Cleaning / steeping 36h / germination 4x24h
 - Saccharification/caramelisation in drum roaster + roasting T_{max} 160°

-
- Raw material: **MALT from cereals**
 - Schonen / weken 36h / kiemen 4x36h/eesten 36h
 - Roasting in drum T_{max} 235°

-
- Time 5/7,5 dag + 3h in trommel
 - Small batches 2,8/4 ton

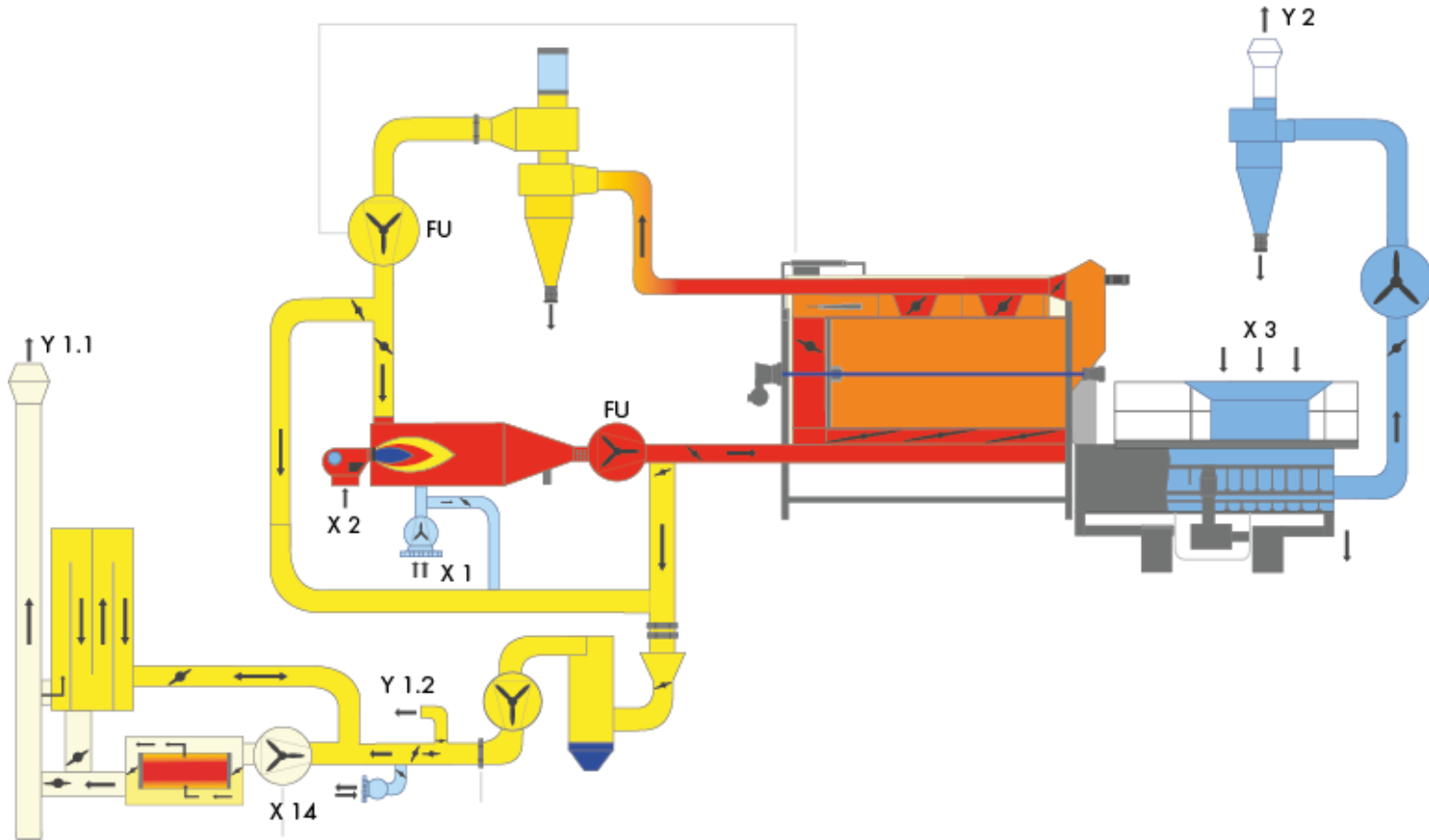




SCHEME DRUM ROASTER

5100 kg
Green malt
Makes 2800 kg
Caramel malt
in aprox 3h

4000 kg
Pilsner malt
makes 3500 kg
Colored malt
in aprox 2-2,2 h







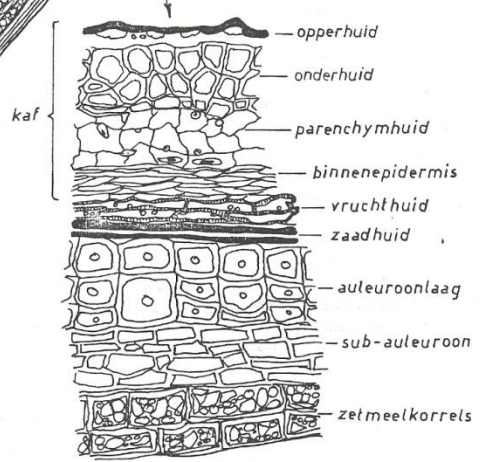
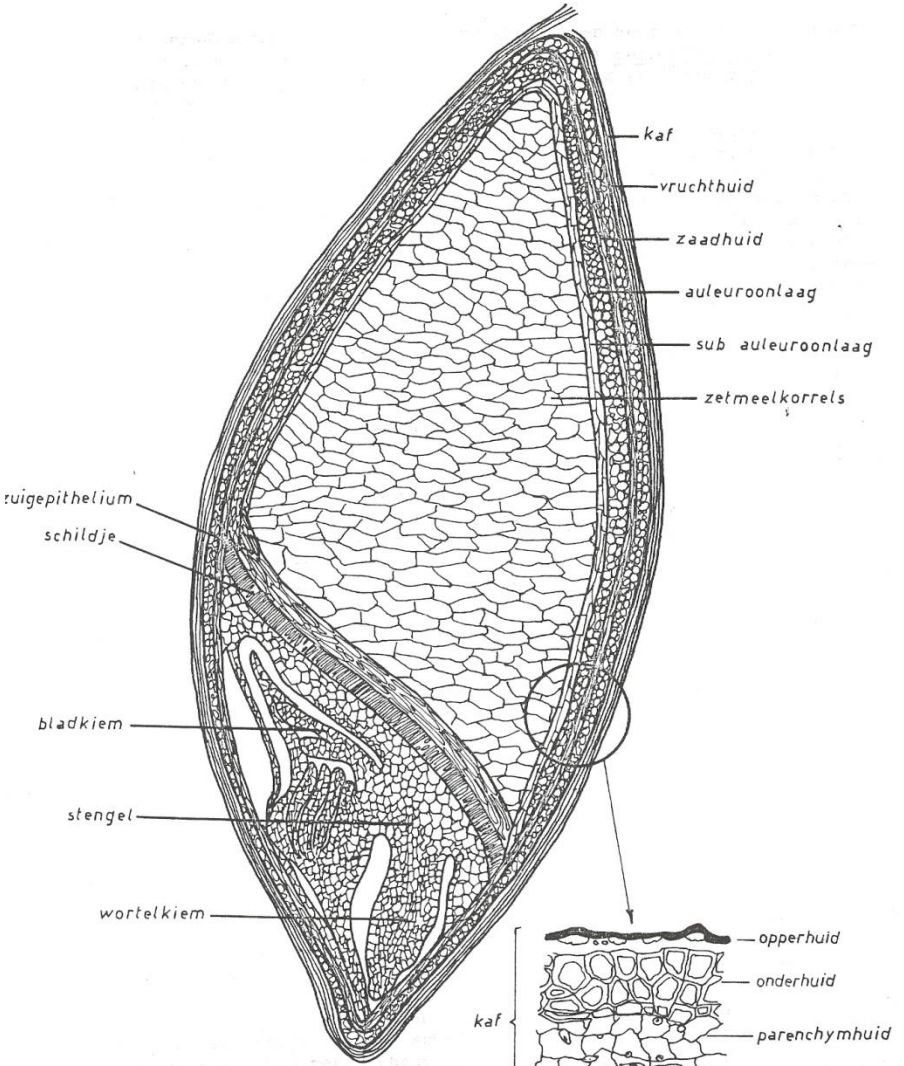


THE SWAEN

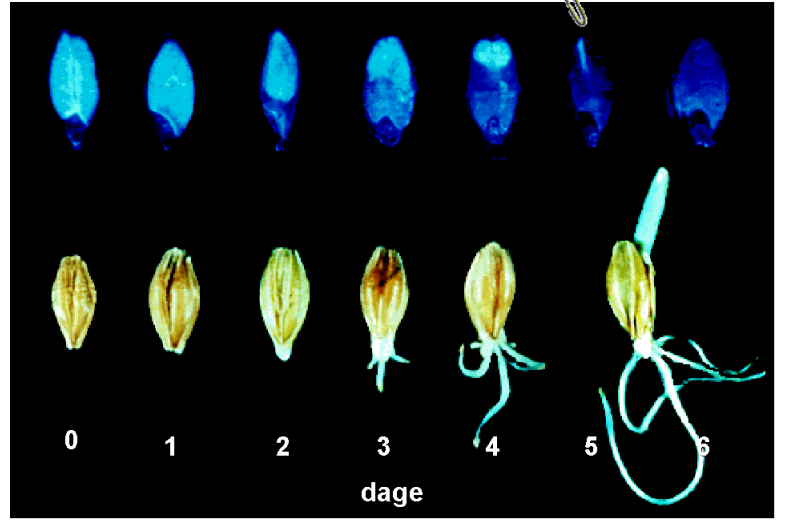
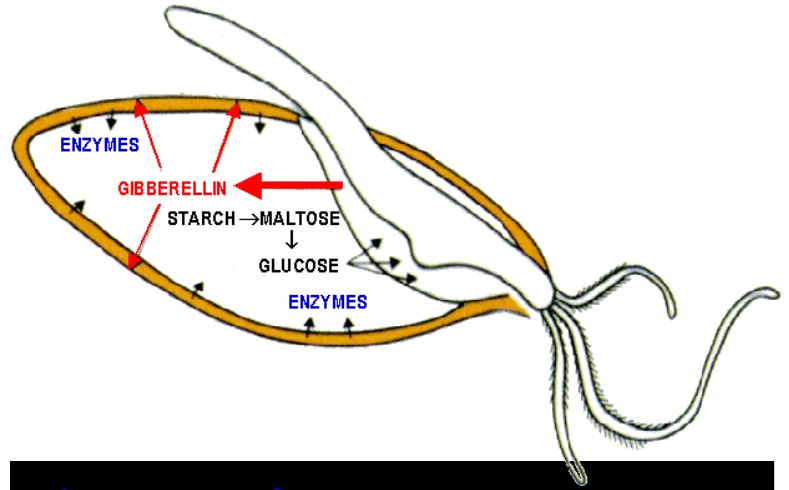
PART 2

STARCH CONVERSION GELATINISATION PROCESS

DEFECTS CROP 2018



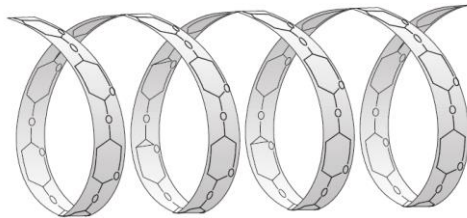
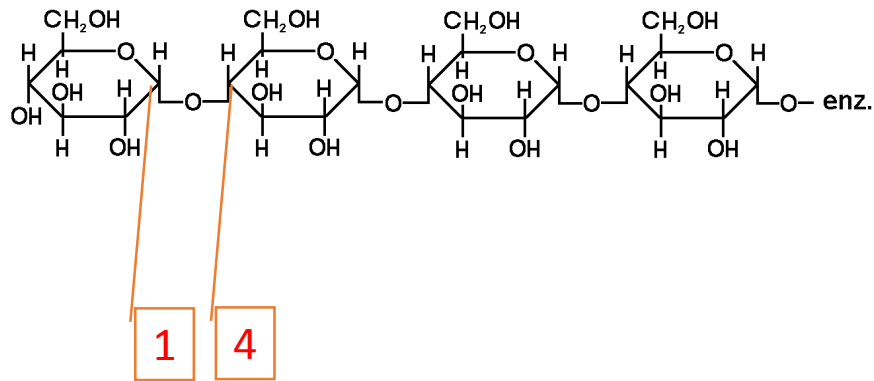
: Inwendige bouw van de gerst: langsdoorsnede



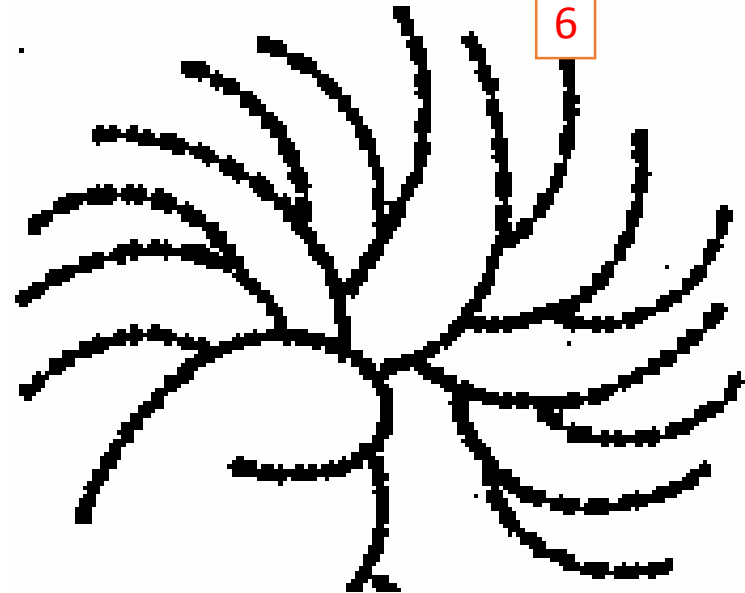
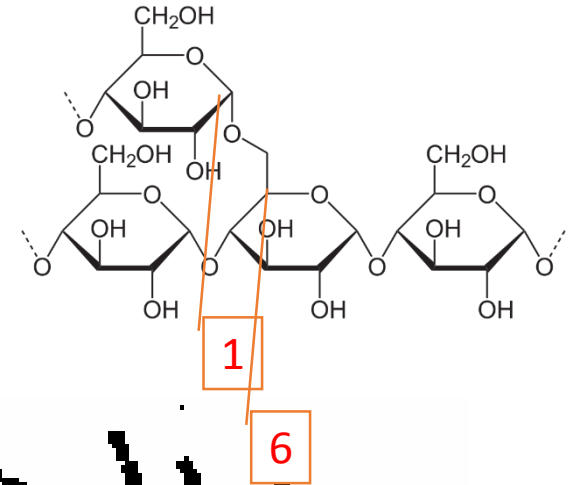
STARCH

Amylose 30% in mass but 150x more molecules than amylo-pectine

AMYLOSE (1-4)



AMYLO-PECTINE (1-4/1-6)



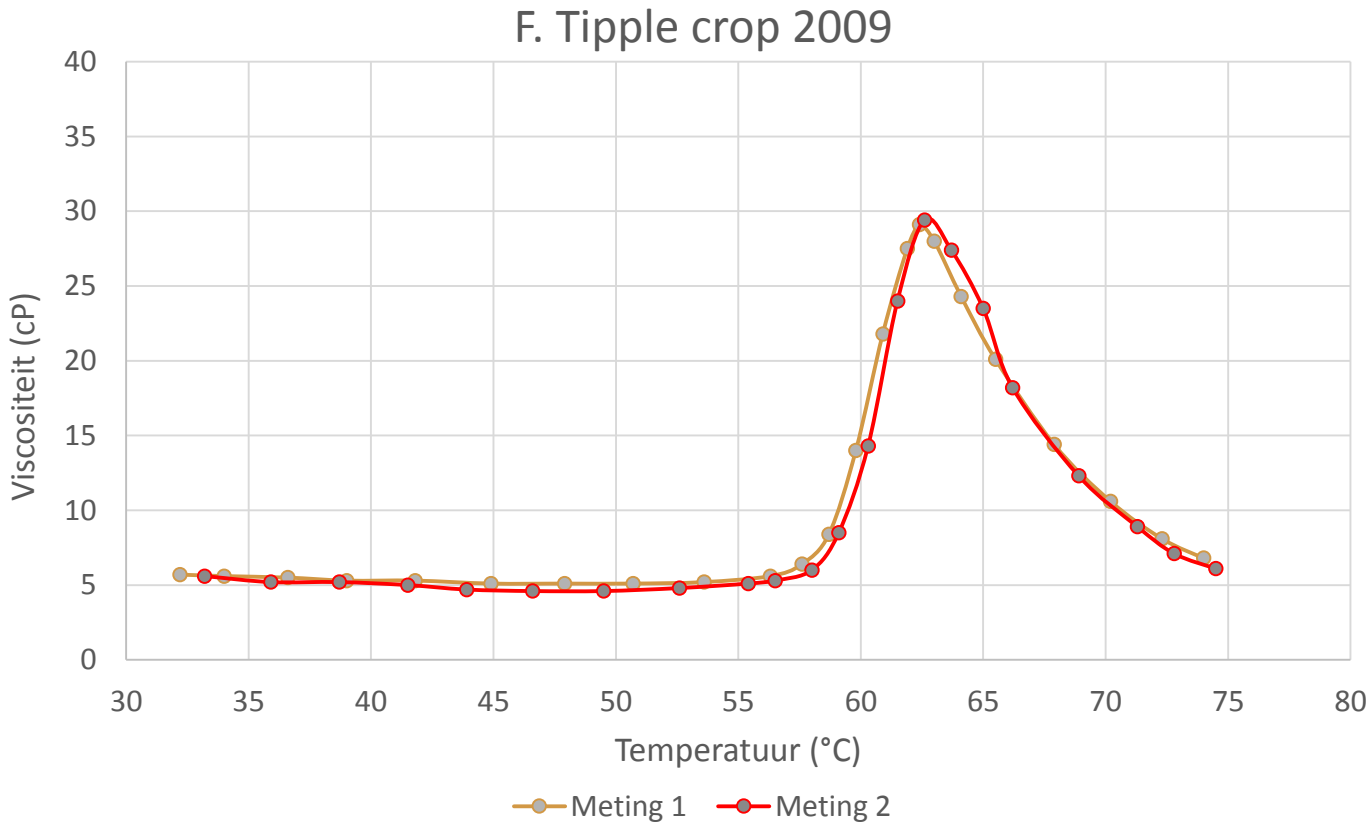
WHAT IS THE MALTSTERS JOB?

- Malt (endosperm) **fully modified**, cell walls of starch granules are perforated/broken down. Grinded malt will be soluble in water during mashing in at the brewery
- **Create** and **set free** enzymes for
 - hydrolysis of proteins and polysaccharides: mainly
 - α – amylase | β – amylase | proteases | β -glucosidase
 - synthesis new molecules for new plant material e.g. roots, etc
 - aerobic (base malts) or anaerobic (base and speciality malts)

ALL READY FOR FAST AND TROUBLE FREE CONVERSION?

-NO.... → remaining starch has still to gelatinize during mashing

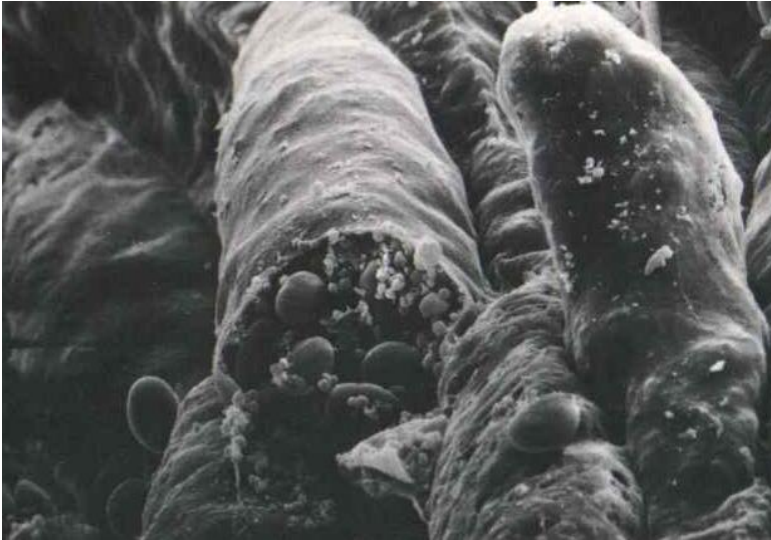
Amylogram



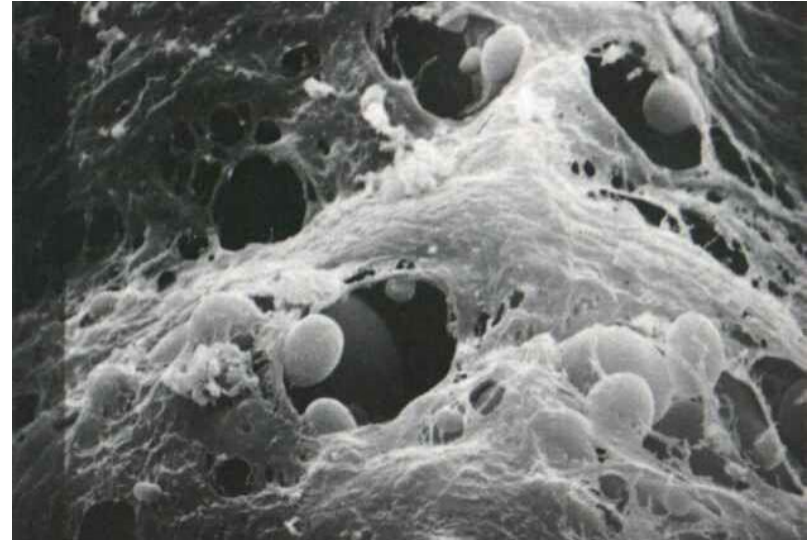
Gelatinizing by heating a mash of malt is in fact the destruction of the membrane of the starch granules whereby the starch can swell, taking water on and getting viscous

1cP = 1mPas

Membranes from the starch granules are already getting broken down during the malting process (β -glucan decreases approx 70-90%)

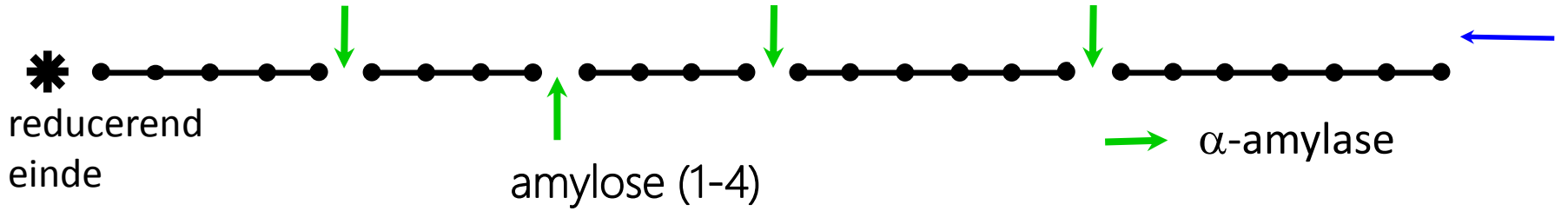


NON MODIFIED GRANULES

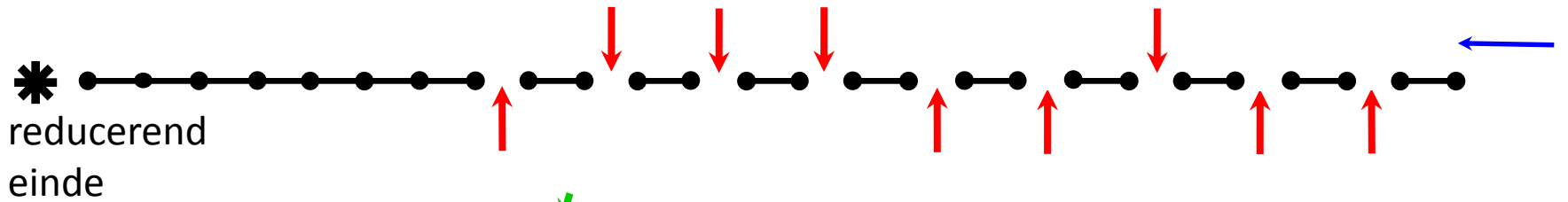


MODIFIED GRANULES

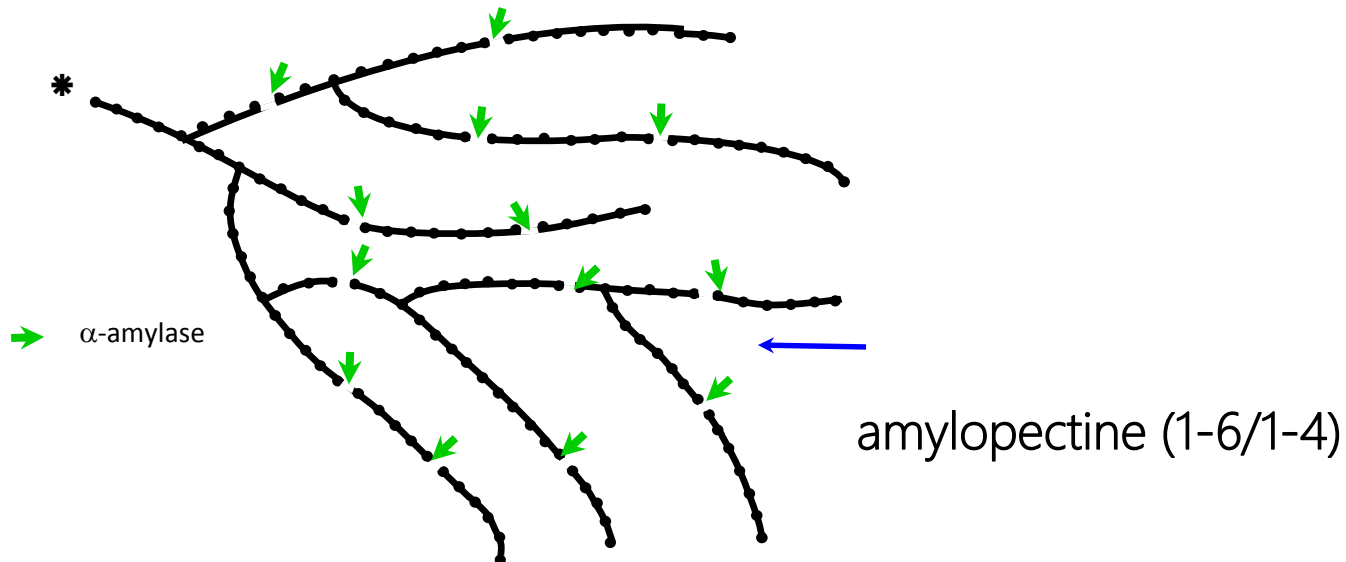
By gelatinizing, amylose and amylopectine is available for α -amylase who will break down the sugar polymers very quickly so the viscosity is going down rapidly



β -amylase

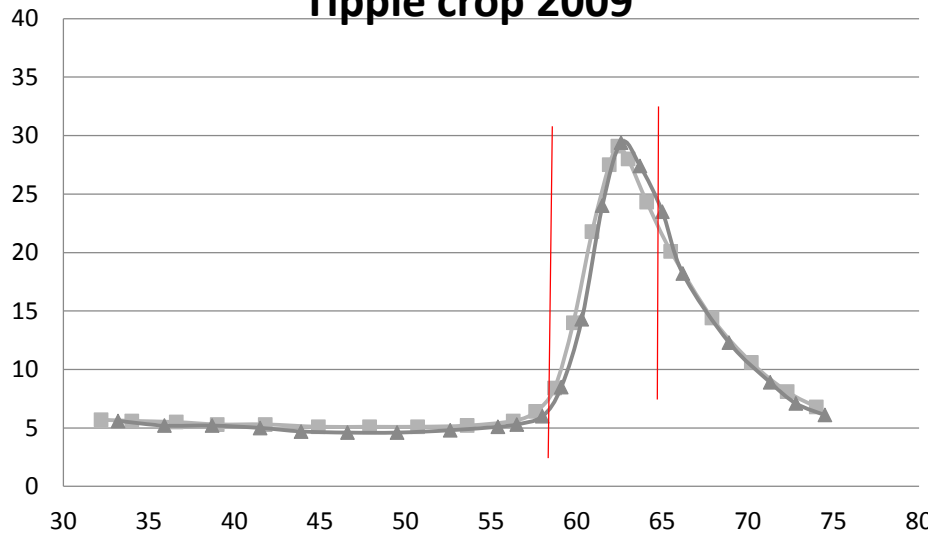


Reducing end



Amylogram

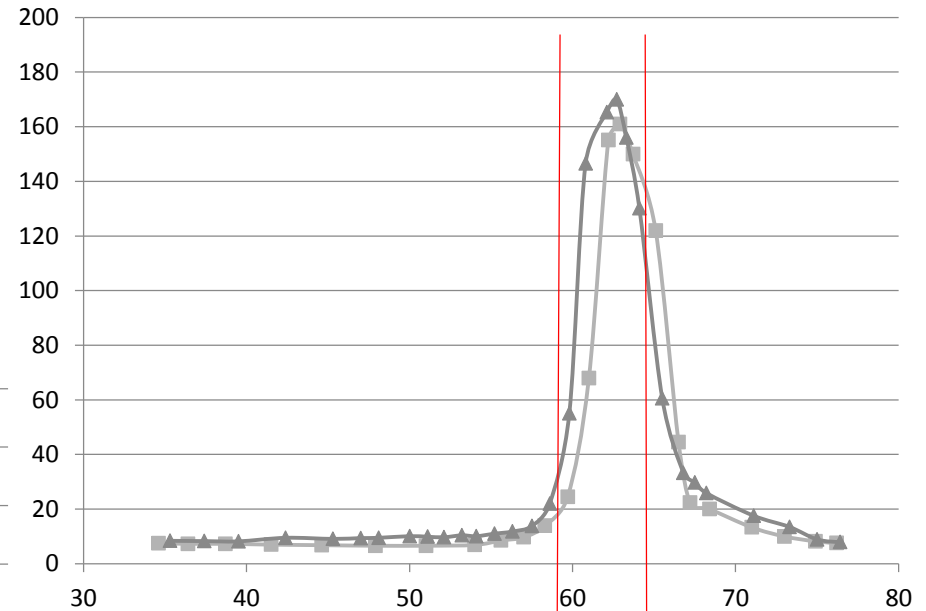
Tipple crop 2009



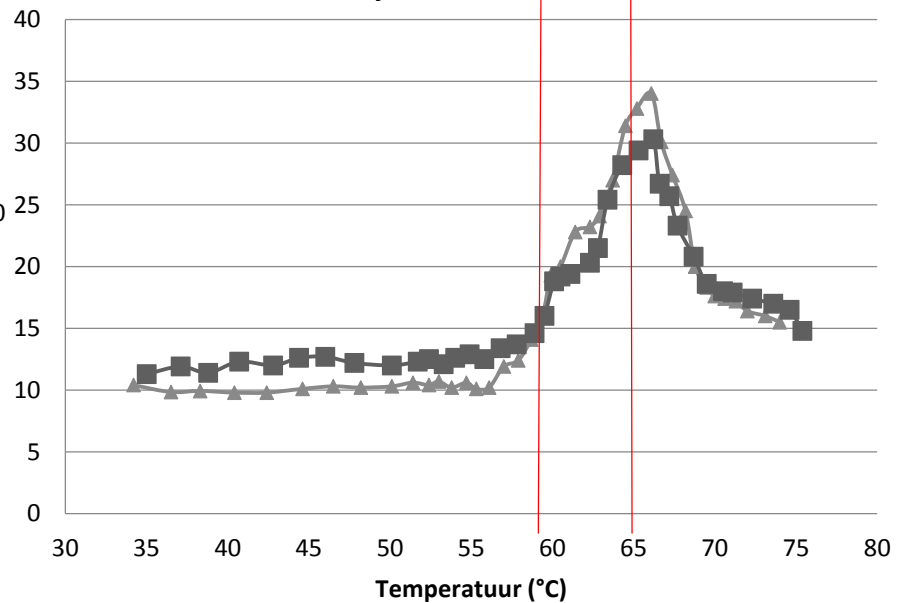
Gelatinising of the remaining starch is happening during mashing in between 59 en 65°C

1cP = 1mPas

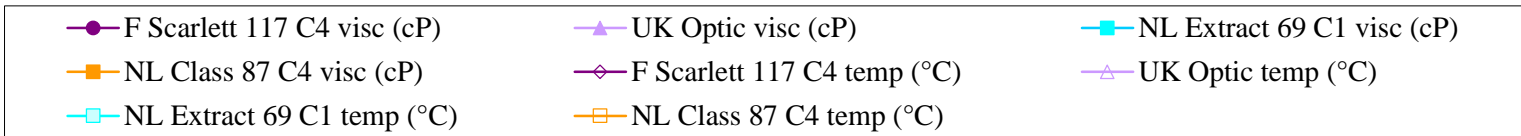
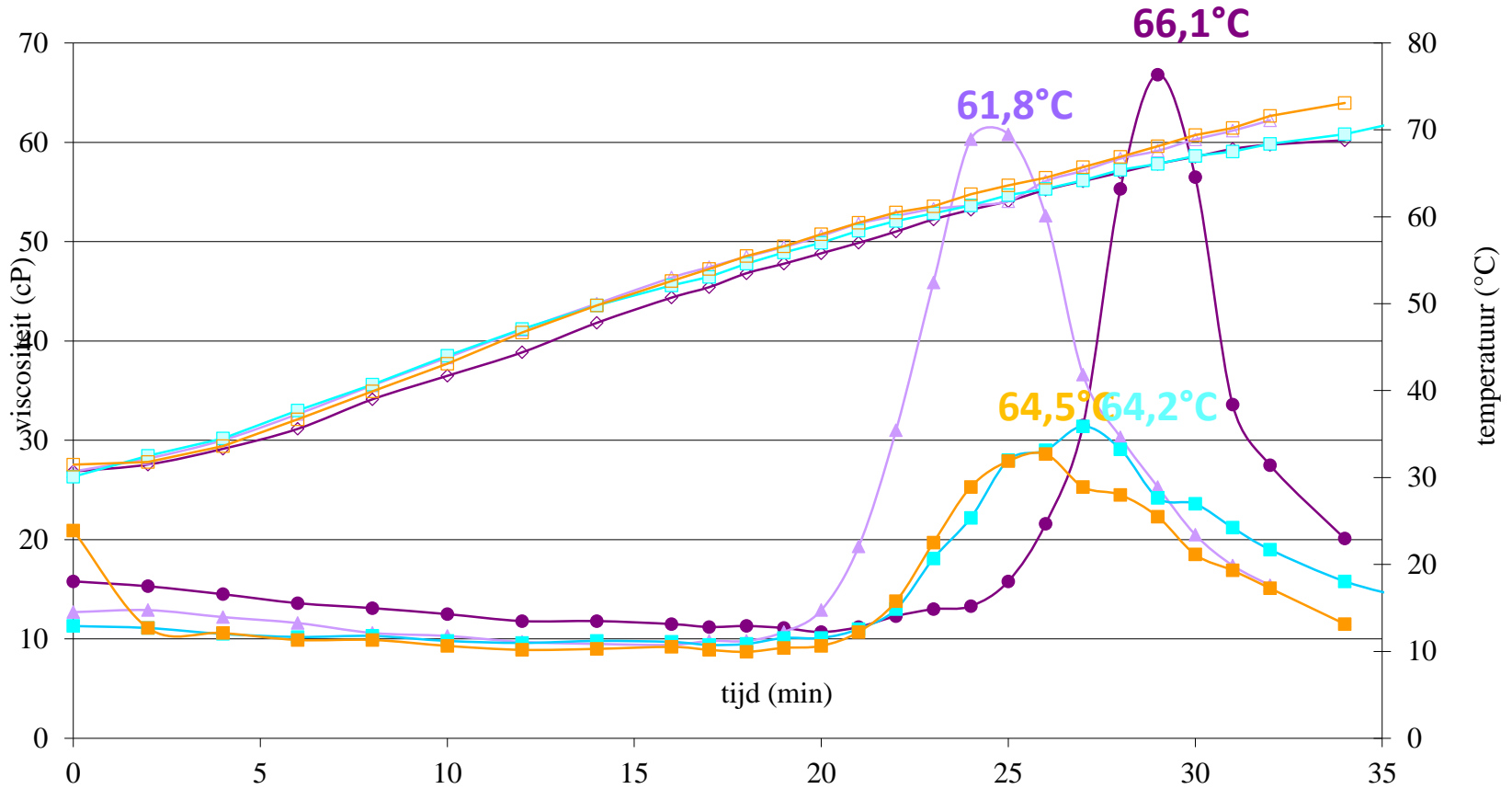
Wintmalt crop 2010



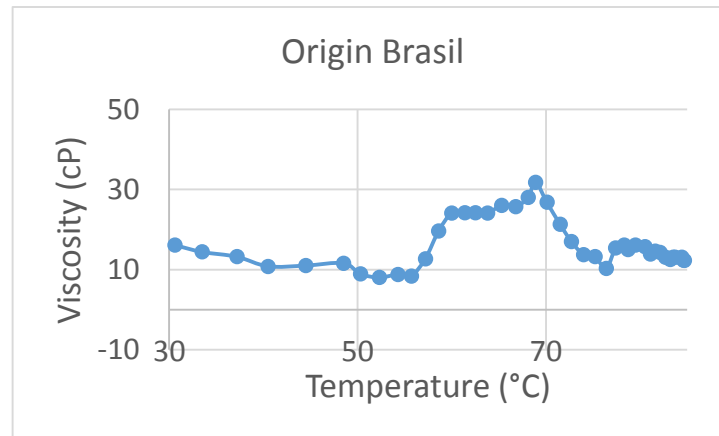
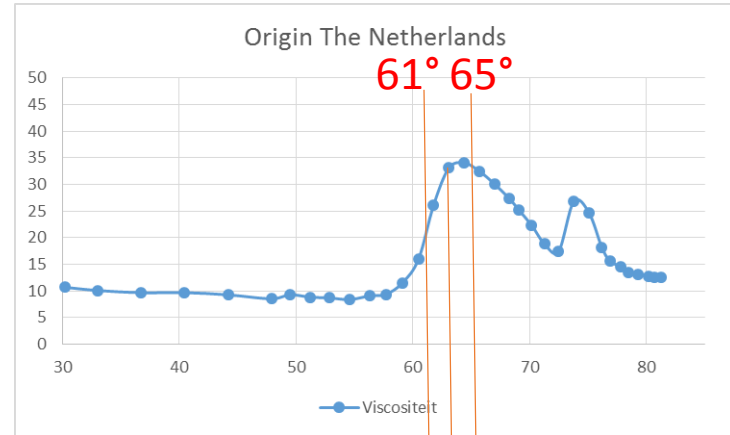
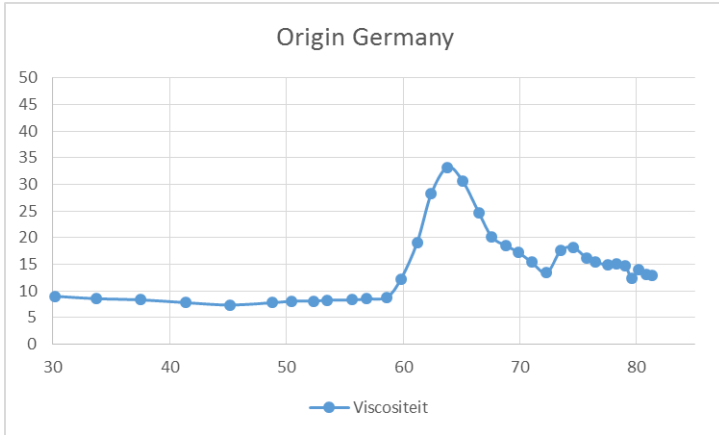
Delivery to E-EU BRY



CROP 2011

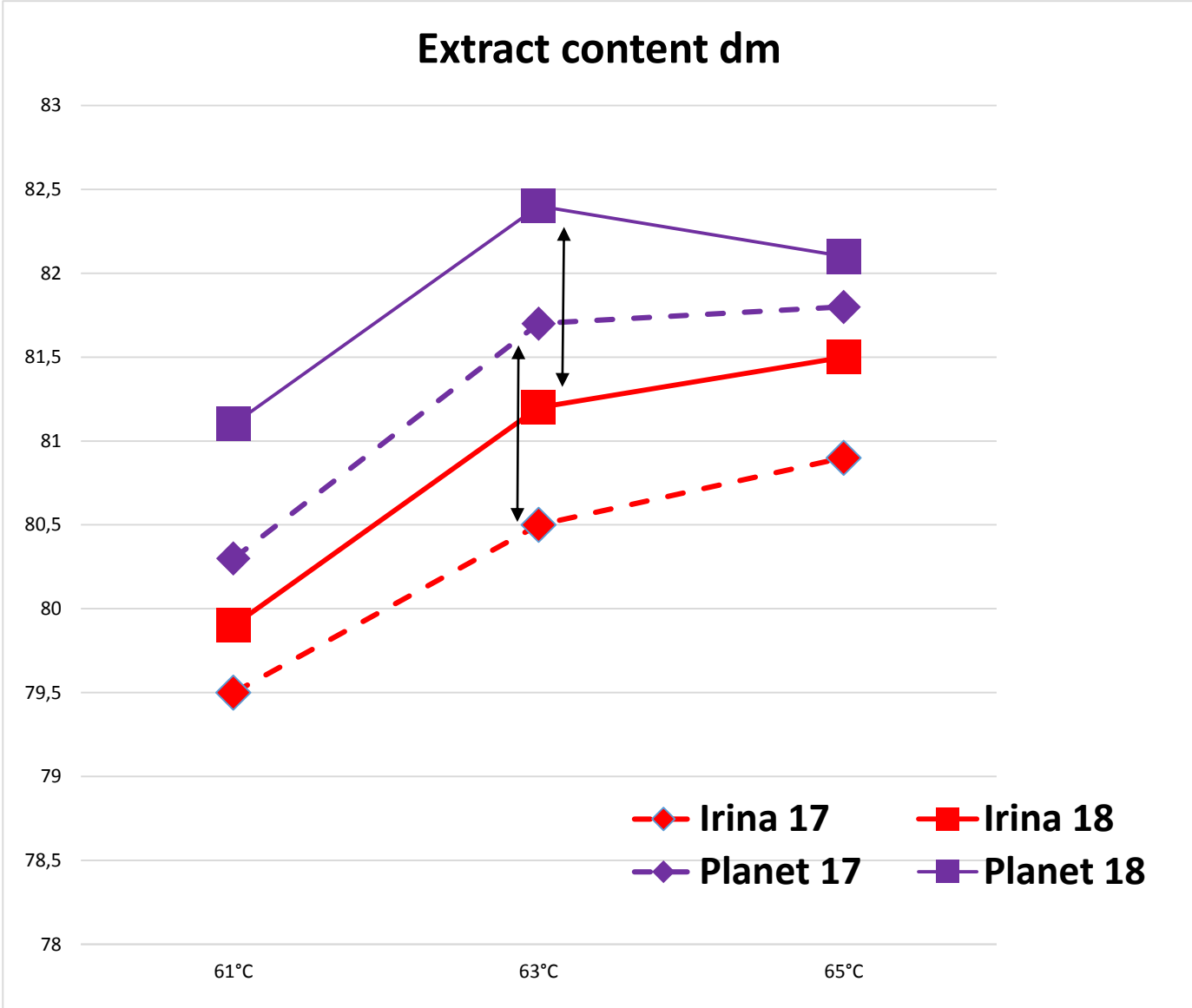


CROP 2018



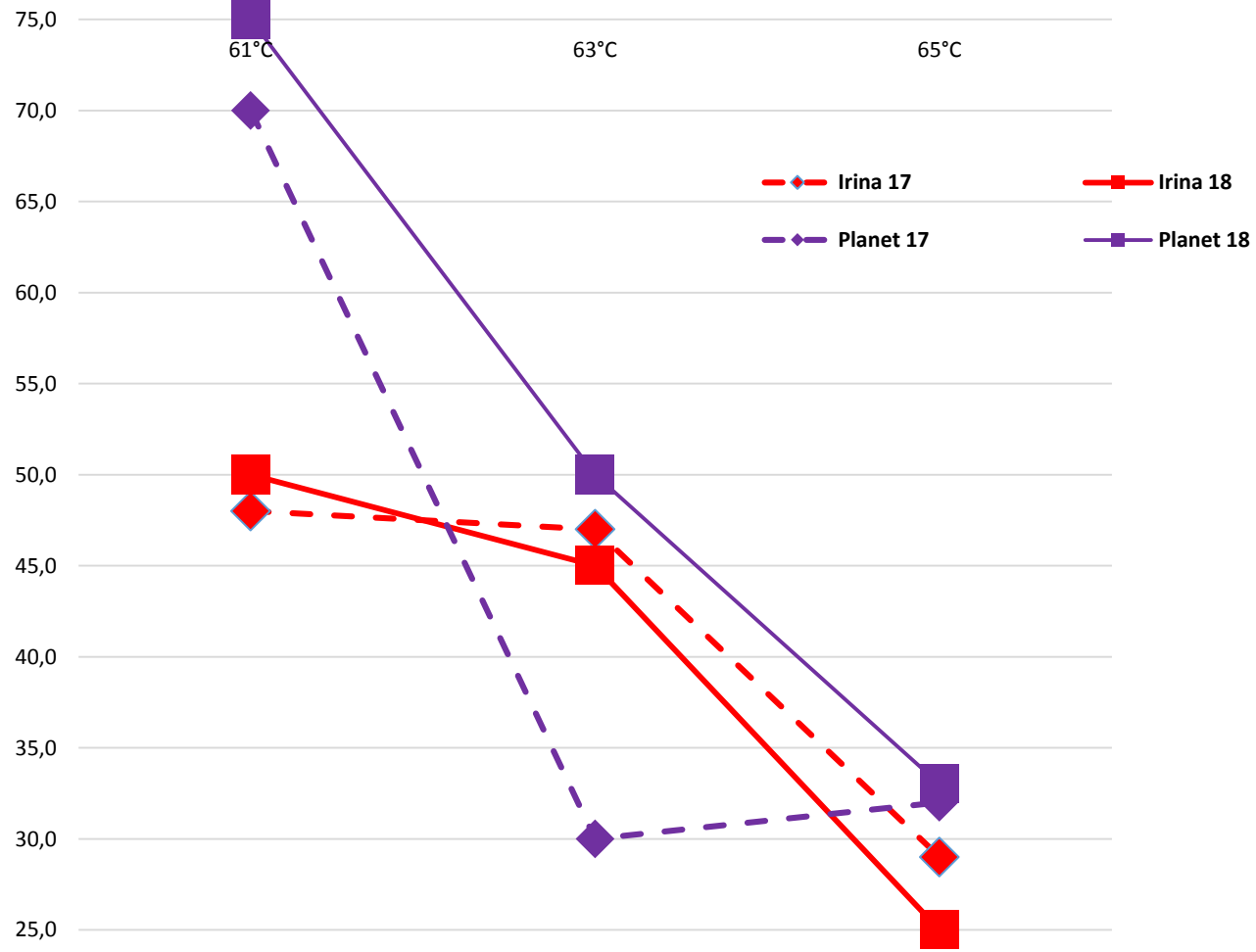
61° 65°

63°

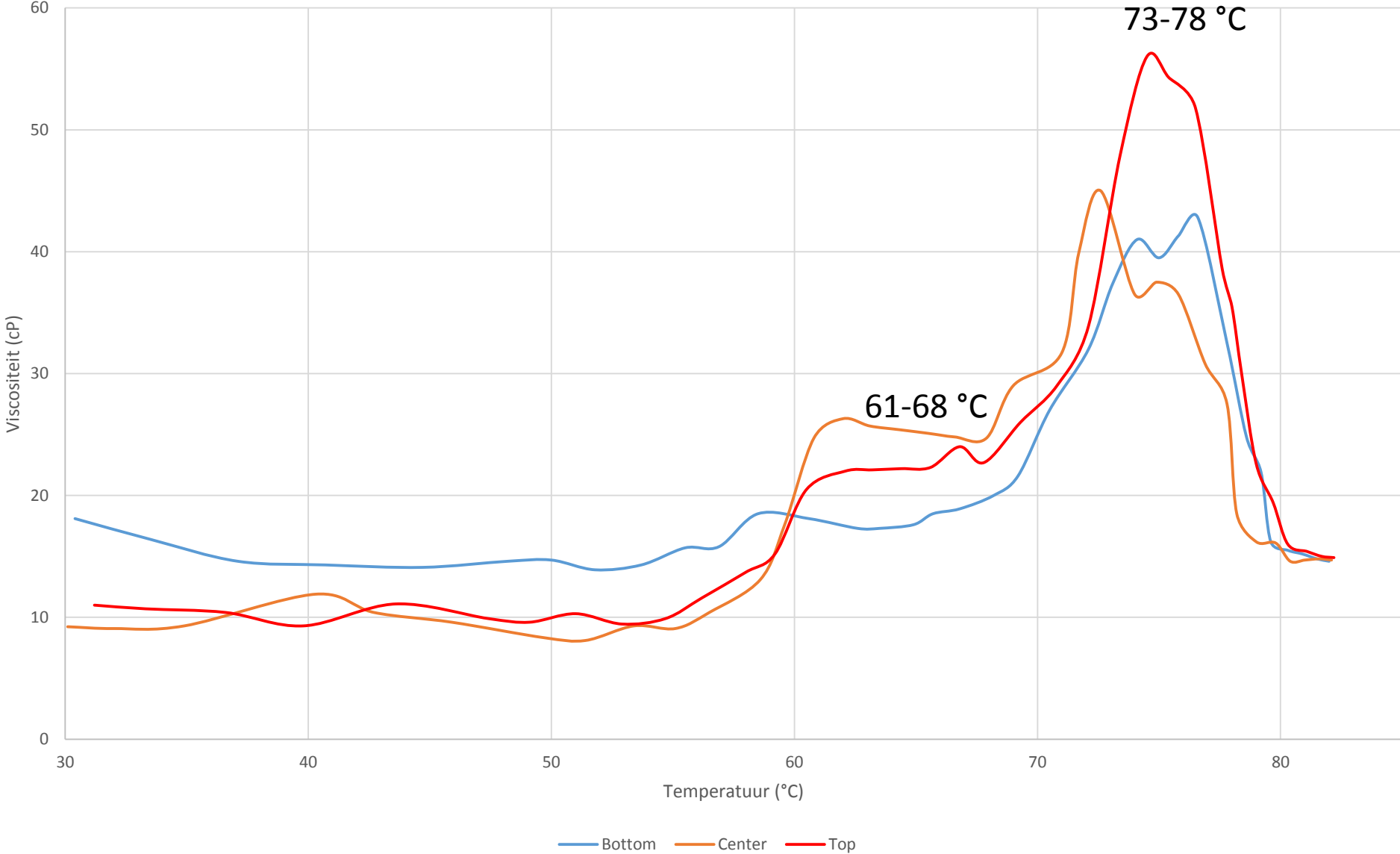


PROTEIN CONTENT BETWEEN 10 AND 10,4%

Filtration time



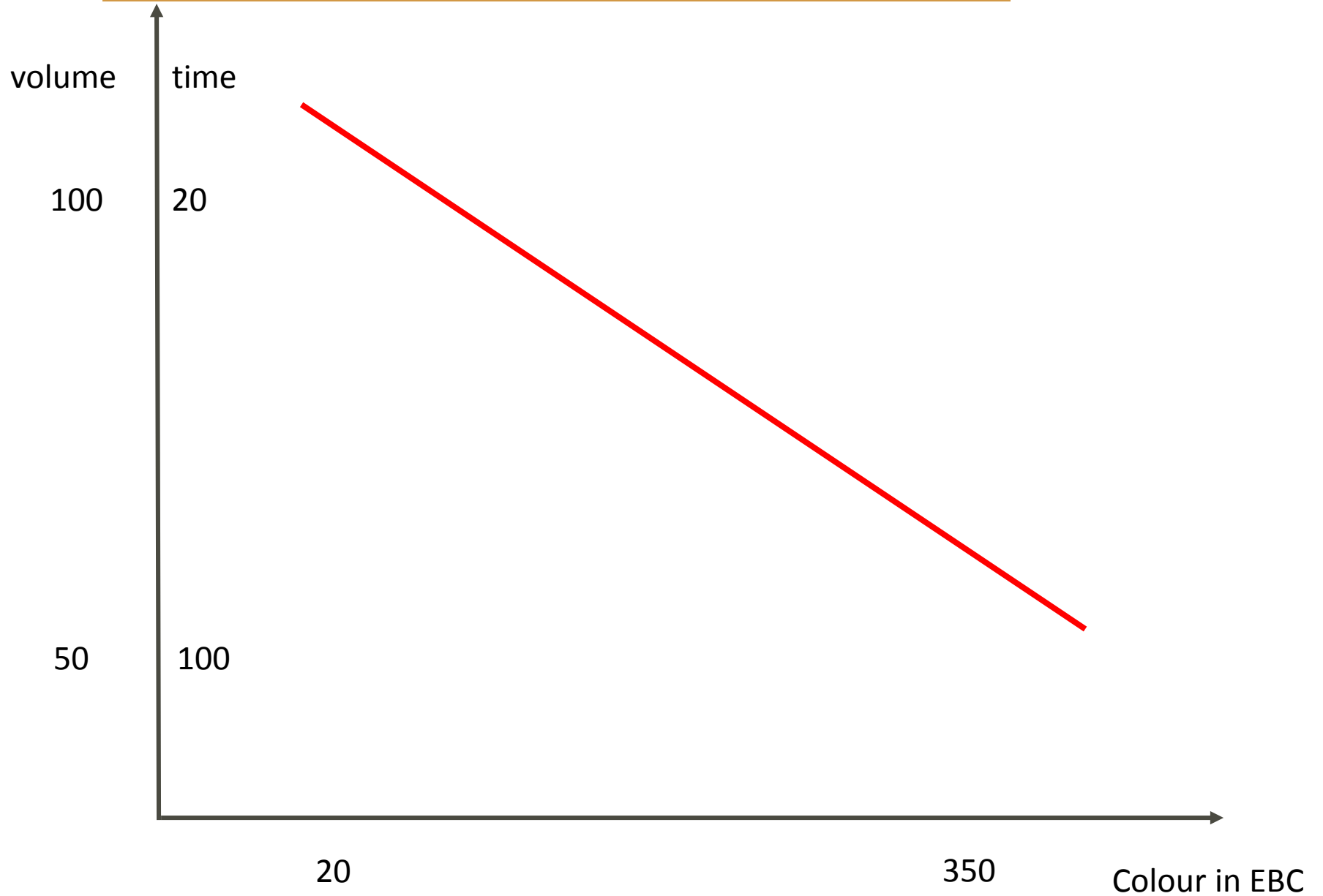
Gelatinization Graph influence variation and heat load



CONCLUSIONS and CONSEQUENCES for CROP 2018

- Mashing in at min 65°C or at least where β -amylase is still working
- Smaller granules are gelatinizing at higher temperature level than bigger ones; normally +1,5°C now up to +5°C
- Conversion problems: starch is still released when β -amylase is inactive. Only α – amylase is still working.
- The amylogram do not give information how much starch is involved
- Use decoction brewing method if possible or even double, or in case of infusion at least sugar rest at 72°C and mashing off at 78°C;
- Amylose can under certain circumstances together with other molecules (proteins) and materials (husk) retain a lot of water and create a gel. Filtration is then almost impossible.

Filtration behavior cara/roast malt

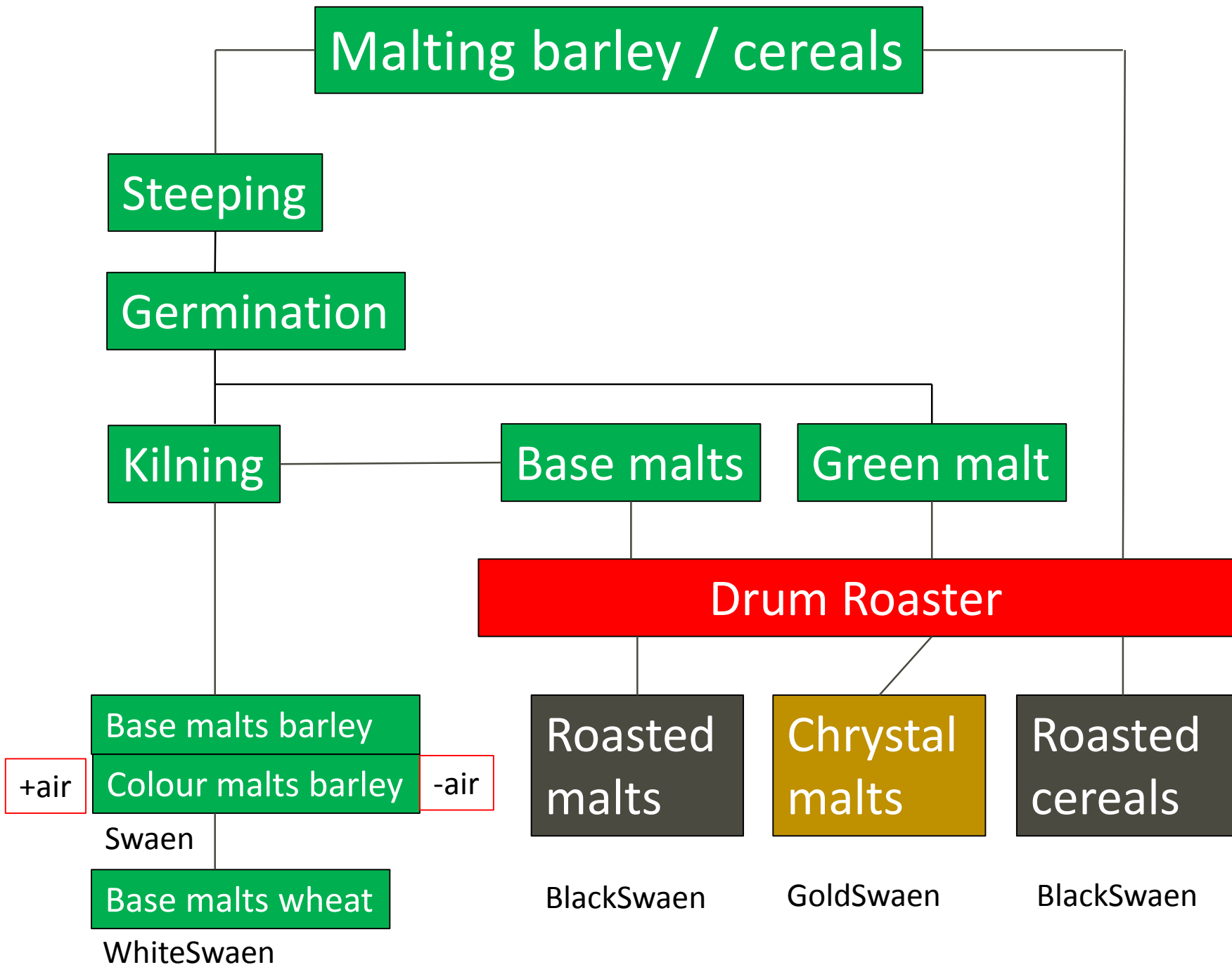


THE SWAEN

PART 3

PRODUCT RANGE COLOURS AND FLAVORS





TECHNICAL OVERVIEW: *classification (special) malts*

1. Use of a **conventional kiln** (max 105°C) – **aerobic** malting process
 - Enzymatic(70°C); Distilling (75°C); Pilsner (85°C)
 - Ale (90°C/6-8 EBC); Vienna/Munich (95-105°C/10-25 EBC)
 - But also malts as Amber (Ambré) (120-160°C/40-60EBC)
2. Use of a **conventional kiln** (max 105°C) – **anaerobic** malting process
 - Acidification/stuwing malt; Melanoidine malt (rode kleur)
3. Use of an extra process step: **saccharification - caramelisation** in a **drum roaster** using green malt (germinating barley)
 - Chrystal or Cara(mel) malt + color: 10 – 60 - **100 -120** – 200 – 400 EBC;
 - **120-165°C**
 - Formation of HMW melanoidines (<70kDa); **combination of:**
 - Maillard reactions starting as from 60+°C (sugar+peptides)
 - Caramelisation reactions starting as from 120°C (degradation of sugars)
 - Formation of heterocyclic **oxigen**-5-rings pyrones/furans/furanones

TECHNICAL OVERVIEW: *classification (special) malts*

4. Use of Base Malt as raw material for roasting in a drum roaster
 - Biscuit 60-90 EBC; Coffee, Chocolate 900 EBC; Black 1250-1500 EBC **max 235°C**
 - ONLY:
 - Maillard reactions starting from 60+°C (sugar+peptides)
 - Formation of heterocyclic **nitrogen**-5-rings: pyrazines/pyridines/pyrroles
 - Complex LMW chromospheres <10kDa and HMW melanoidines
 - Self ignition temperature of malt is 230-232°C; automatic continuation of roasting up to carbonisation – auto combustive – as from 190°C
 - Quit high malt(ing) losses



SWAEN®

GOLDSWAEN®

BLACKSWAEN®

WHITESWAEN®

GREENSWAEN®

PLATINUMSWAEN®

SIMPLY PERFECT

PURE CARA

RICH & INTENS

FULL OF WHEAT

NATURAL & FAIR

RAFFINESSER



Distilling
Enzymatic
Lager
Pilsner
Ale
Vienna
Munich
Munich
light

Munich
dark
Amber
Melany

Light
Hell
Belge
RED
Amber
Munich light
Classic
Munich dark
Brown Light
Brown
Aroma

Biscuit
Honey Biscuit
Ruby Biscuit
Coffee
Chocolate B
Chocolate W
Black
Extra Black

Gerst
Wheat
(Rye)

Special
(Dark)
(Enzymatic)

Lager
Pilsner
Ale
Vienna
Munich light
Munich dark
Enzymatic

Spelt
Bohemian
Belgian
(Peated)
Smoked
Rye

4 EQUAL COLOURS, 4 DIFFERENT FLAVOURS

- Swaen©Melany 60-80 EBC
- GoldSwaen©Amber 60-80 EBC
- BlackSwaen©Biscuit 60-80 EBC
- BlackSwaen©HoneyBiscuit 60-80 EBC

- Swaen©Melany 60-80 EBC

kilned

- GoldSwaen©Amber 60-80 EBC
saccharification caramelisation

- BlackSwaen©Biscuit 60-80 EBC
kilned and toasted

- BlackSwaen©HoneyBiscuit 60-80 EBC
special kilned and toasted



FLAVOUR DESCRIPTION

SENSORY versus ANALYTICAL ANALYSIS

- malty/almond **3-methylbutanal** mout/amandel
- bitter/burnt **2-methylpyrazine** bitter/verbrand
- bread **2-acetylthiazol** brood
- breadcrust **2-acetylpyrrol** broodkorst
- popcorn **2-acetylpyridine** popcorn
- caramel/sweet **maltol** caramel/zoet
- phenolic/spicy/smoked **4-vinylguaiacol** gekruid/gerookt/fenolisch
- violets **β -ionon** viooltjes
- caramel **2,5-dimethyl-4-hydroxy-3(2H)-furanon** caramel

FLAVOUR DESCRIPTION SENSORY ANALYSIS

Pilsener/Lager

Malty
Green
Sweet
Sulferic

Coloured

Malty
Light roast
Nutty
Bread
Biscuit/Cookie

Roasted (Toasted)

Coffee (Biscuit/Cookie)
Strong roast/Burnt
Chocolate
Bitter/Astringency

Chrystal/Cara

Malty
Caramel
Toffee

FLAVOUR DESCRIPTION
RESEARCH AT UNIVERSITY OF LEUVEN (B)
DEPARTMENT INDUSTRIAL SCIENCE –MALTING & BREWING –
GHENT(B)

- **FOCUS**
 - Not analytical, only sensory analysis
 - Prediction in wort flavour and taste
 - Differences in composition and substitution
- **METHOD**
 - EBC - Congress maisch
 - For speciality malts analysis not the usual 50/50 but 5 to 50% special malt into base (lager)malt
 - Taste panel: 106 profiles: 3 coloured/8 crystal/5 roasted
 - Also extract, pH, AAL, moisture were compared

FLAVOUR DESCRIPTION

COLOURED MALTS

light

Swaen©Vienna	11/15 EBC
--------------	-----------

Swaen©Munich dark	17/22 EBC
-------------------	-----------

dark

Swaen©Melany	75/95 EBC
--------------	-----------

FLAVOUR DESCRIPTION

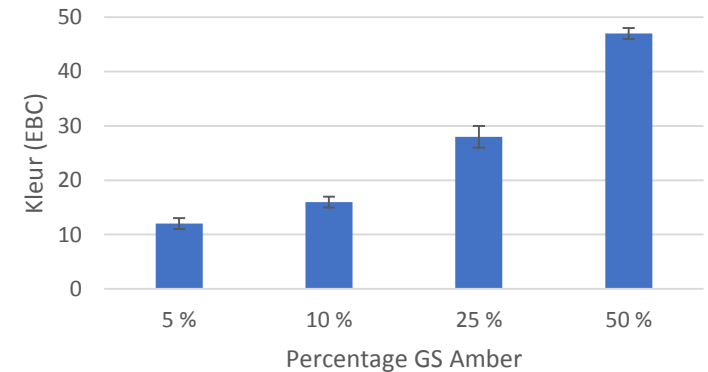
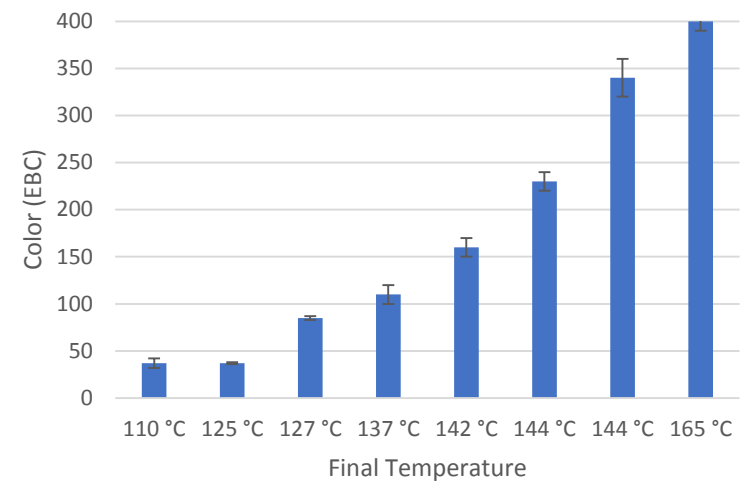
CAMELISED (CRISTAL) MALTS

light

GoldSwaen©Hell	25/37 EBC
GoldSwaen©Belge	32/37 EBC
GoldSwaen©Amber	73/85 EBC
GoldSwaen©Munich light	96/110 EBC

dark

GoldSwaen©Munich dark	150/160 EBC
GoldSwaen©Brown	230/230 EBC
GoldSwaen©Brown Supreme	340/340 EBC
GoldSwaen©Aroma	380/400 EBC



FLAVOUR DESCRIPTION

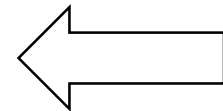
ROASTED MALTS

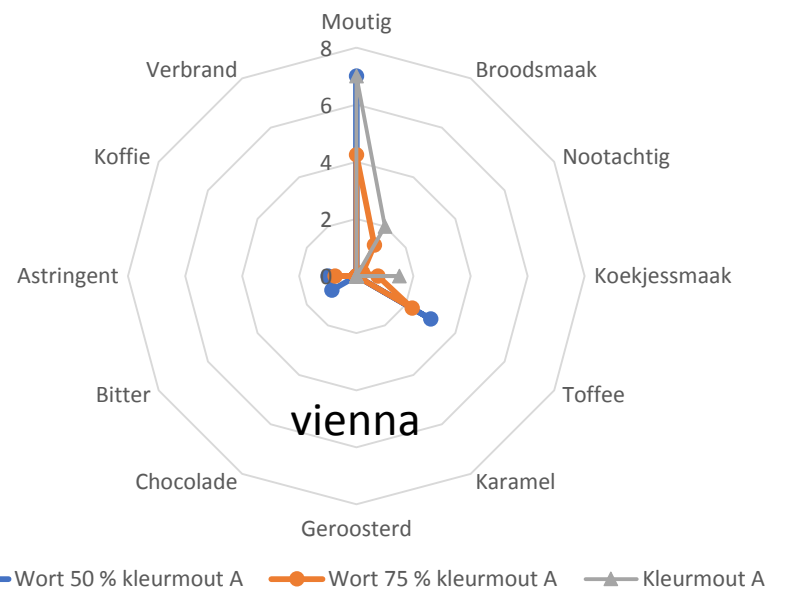
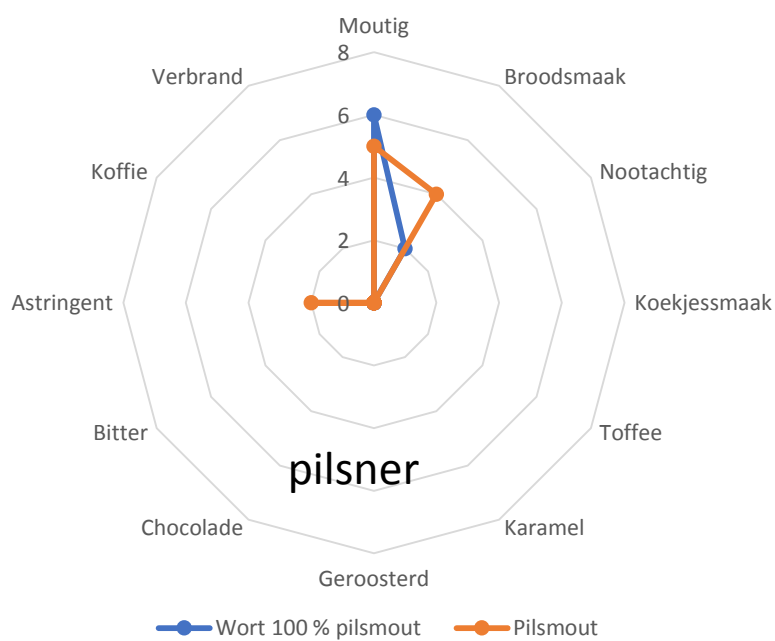
toasted

BlackSwaen©Biscuit	48/63 EBC
BlackSwaen©HoneyBiscuit	68/81 EBC

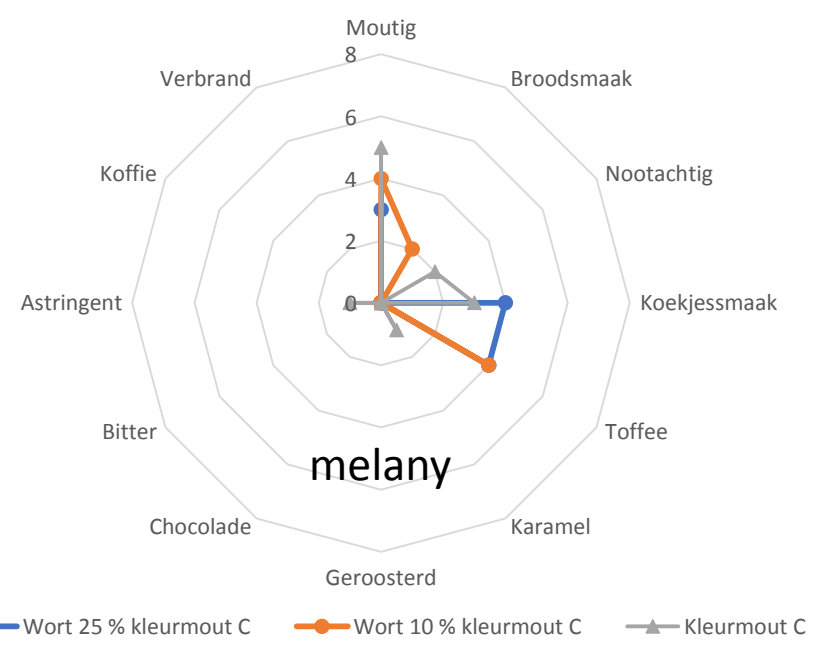
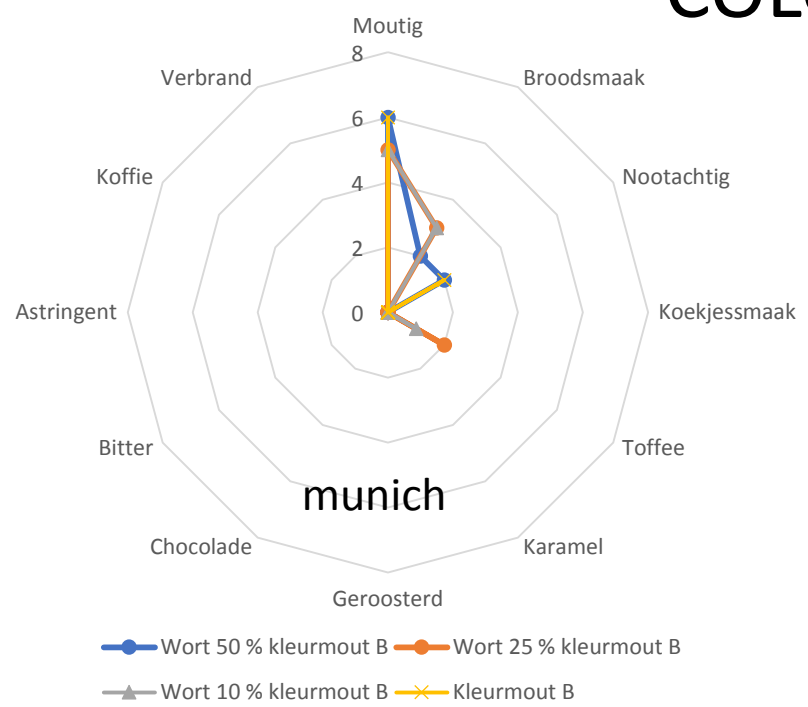
roasted

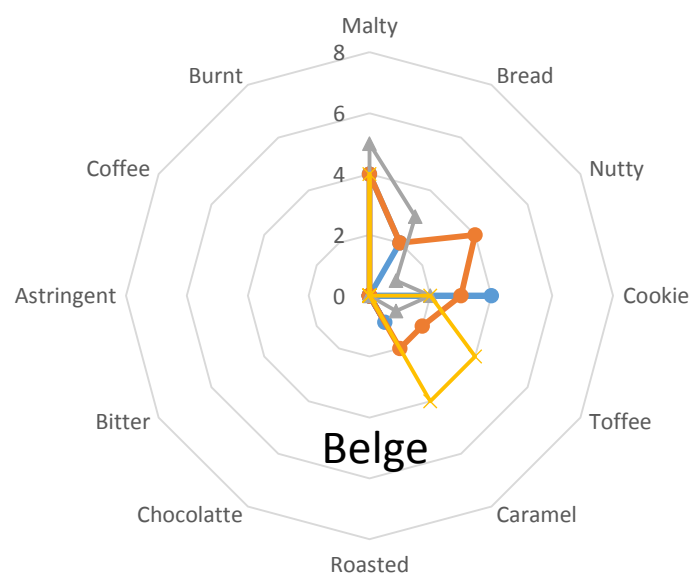
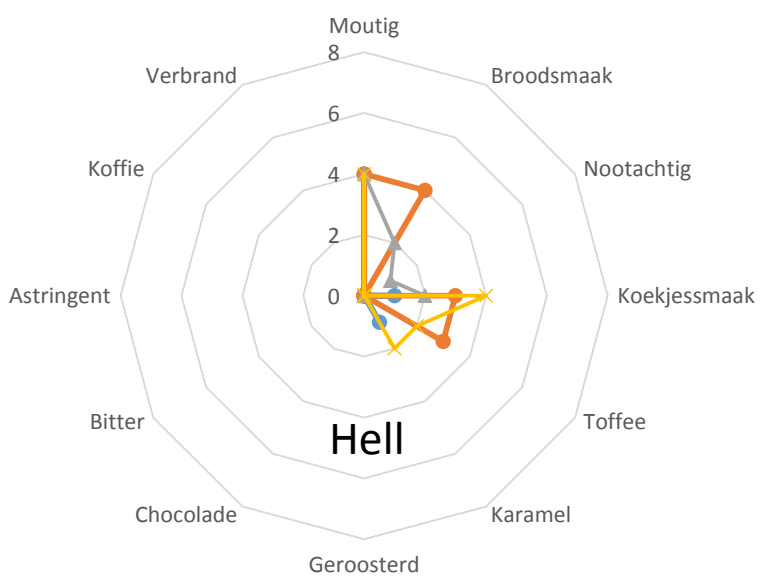
BlackSwaen©Coffee	740/660EBC
BlackSwaen©Black wheat	1400/1200EBC
BlackSwaen©Extra black	1500/1300EBC





COLOURED

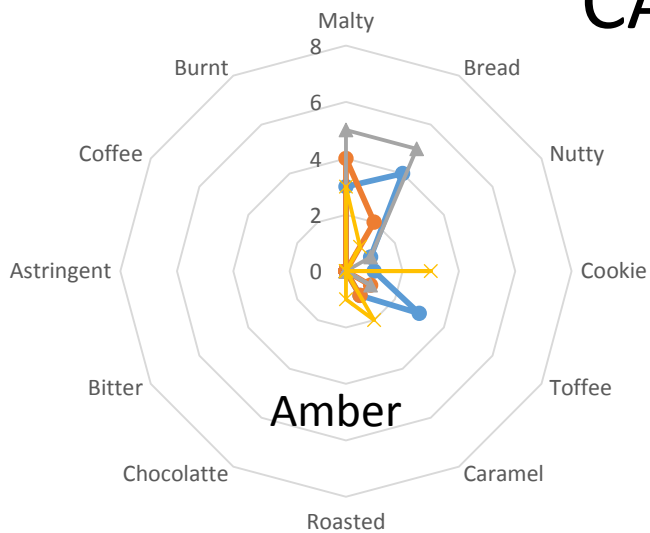




● Wort 50 % karamelmout A
 ● Wort 25 % karamelmout A
 ▲ Wort 10 % karamelmout A
 ✕ Karamelmout A

● Wort 50 % karamelmout B
 ● Wort 25 % karamelmout B
 ▲ Wort 10 % karamelmout B
 ✕ Karamelmout B

LIGHT CAMELIZED

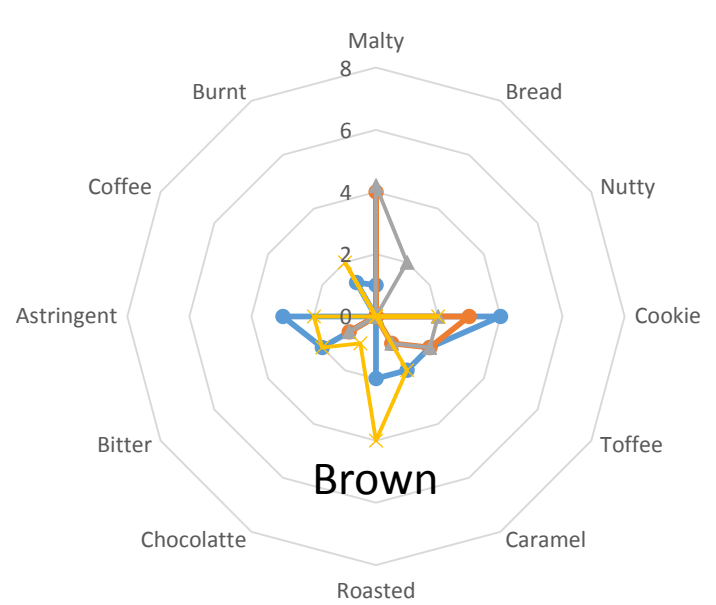


● Wort 25 % karamelmout C
 ● Wort 10 % karamelmout C
 ▲ Wort 5 % karamelmout C
 ✕ Karamelmout C

● Wort 25 % karamelmout D
 ● Wort 10 % karamelmout D
 ▲ Wort 5 % karamelmout D
 ✕ Karamelmout D

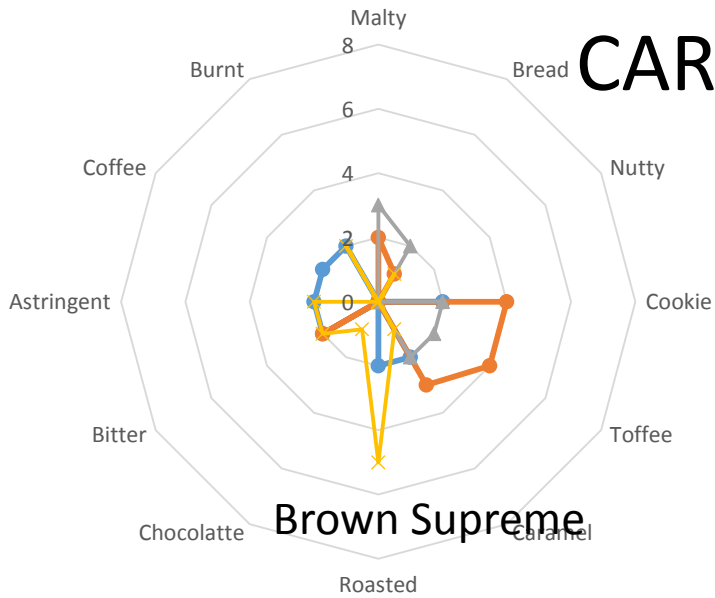


- Wort 25 % karamelmout E ● Wort 10 % karamelmout E
- ▲ Wort 5 % karamelmout E ✕ Karamelmout E

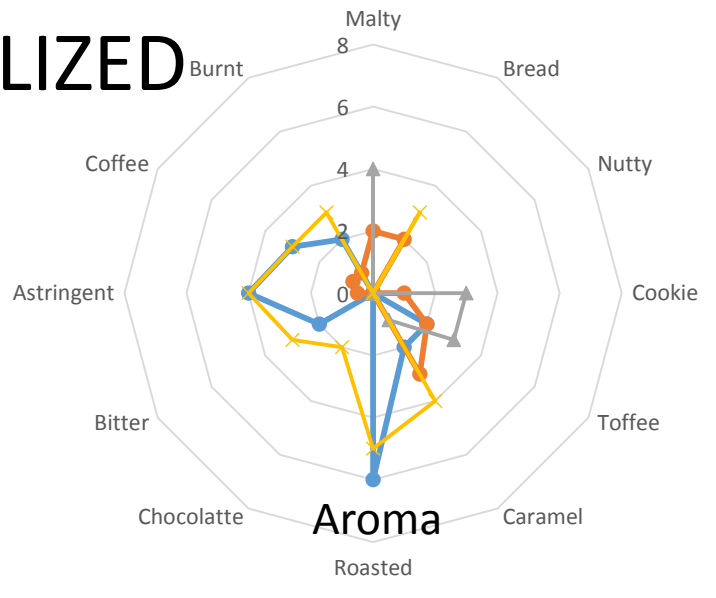


- Wort 25 % karamelmout F ● Wort 10 % karamelmout F
- ▲ Wort 5 % karamelmout F ✕ Karamelmout F

DARK CAMELIZED

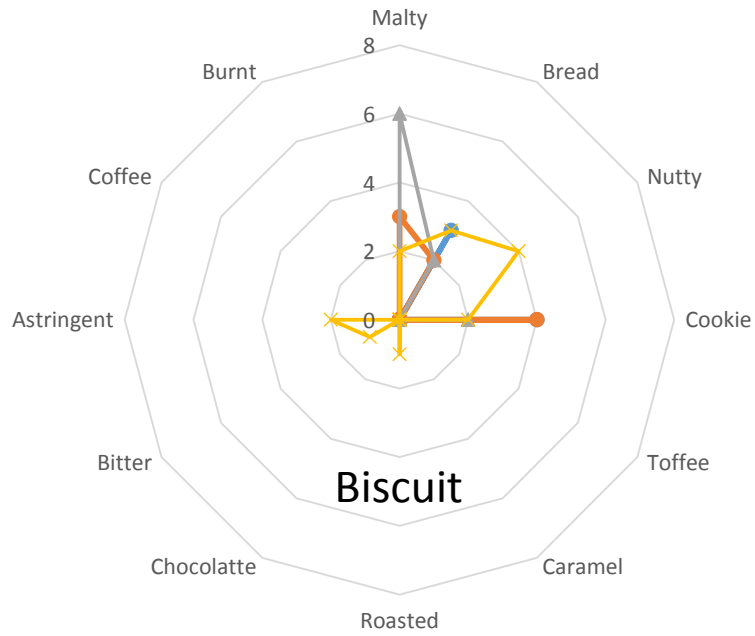


- Wort 25 % karamelmout G ● Wort 10 % karamelmout G
- ▲ Wort 5 % karamelmout G ✕ Karamelmout G

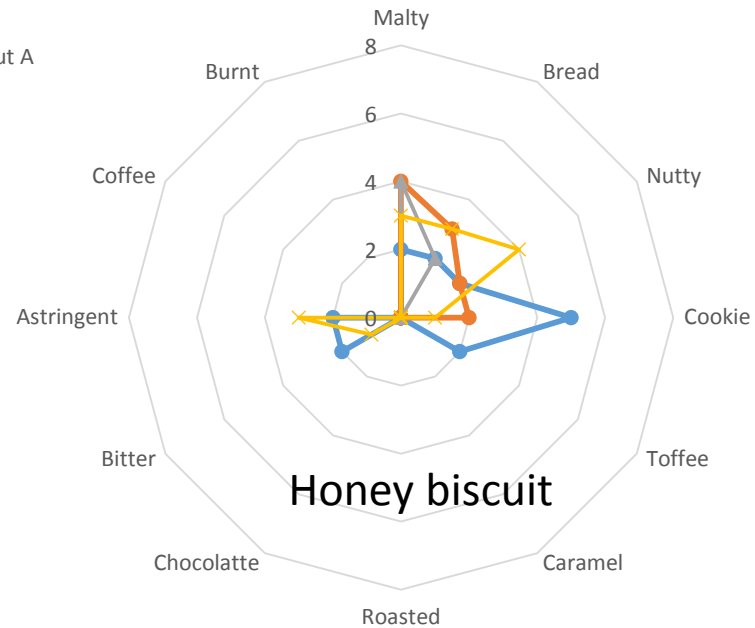


- Wort 25 % karamelmout H ● Wort 10 % karamelmout H
- ▲ Wort 5 % karamelmout H ✕ Karamelmout H

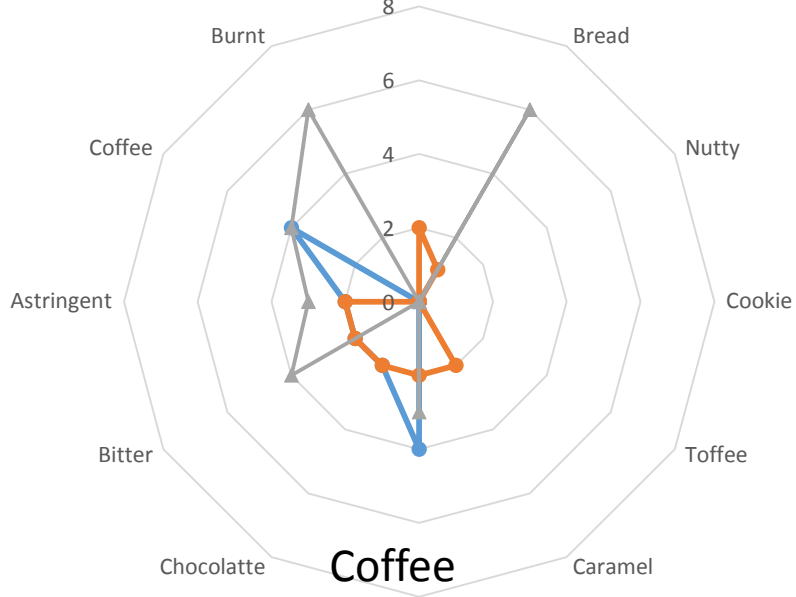
TOASTED



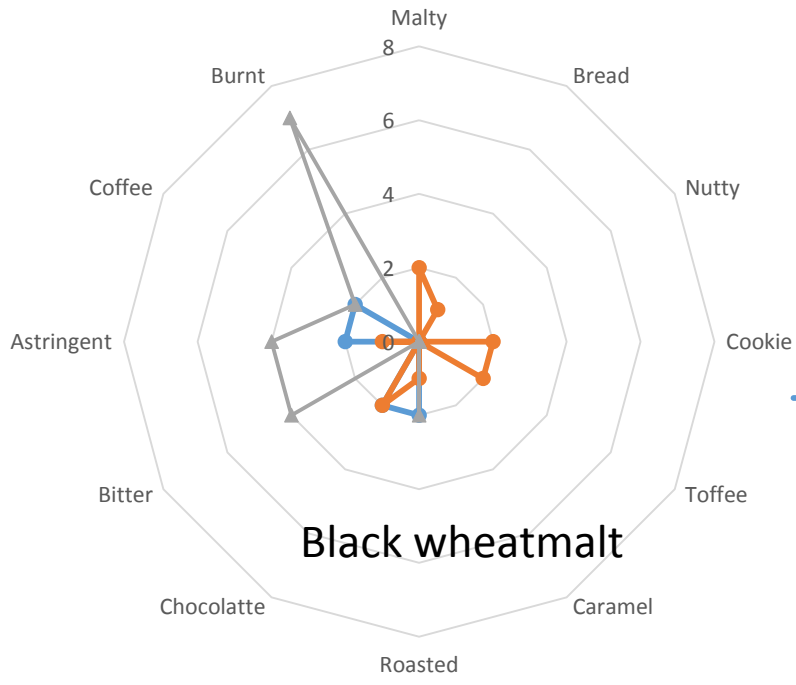
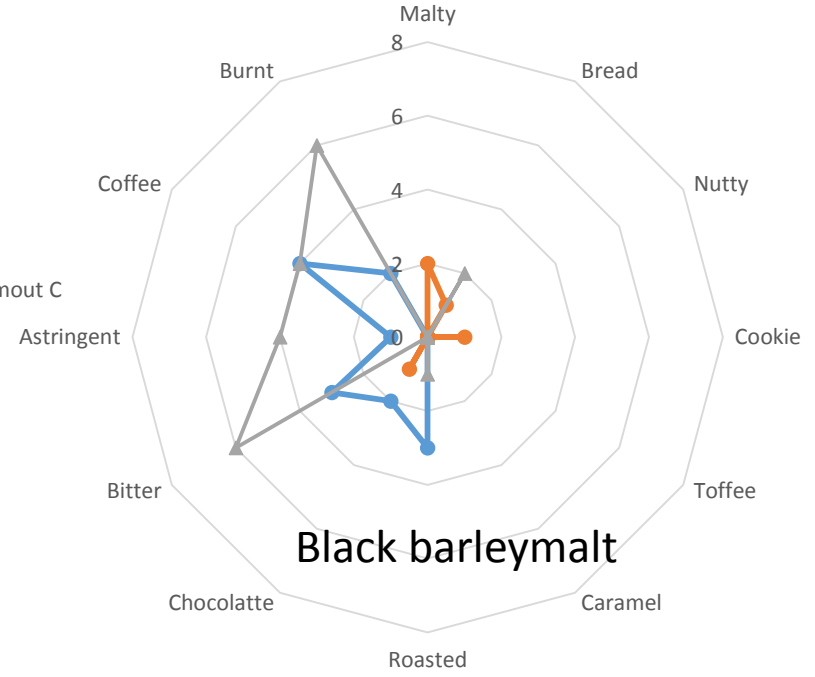
- Wort 25 % geroosterde mout A
- Wort 10 % geroosterde mout A
- ▲ Wort 5 % geroosterde mout A
- ✕ Geroosterde mout A



- Wort 25 % geroosterde mout B
- Wort 10 % geroosterde mout B
- ▲ Wort 5 % geroosterde mout B
- ✕ Geroosterde mout B

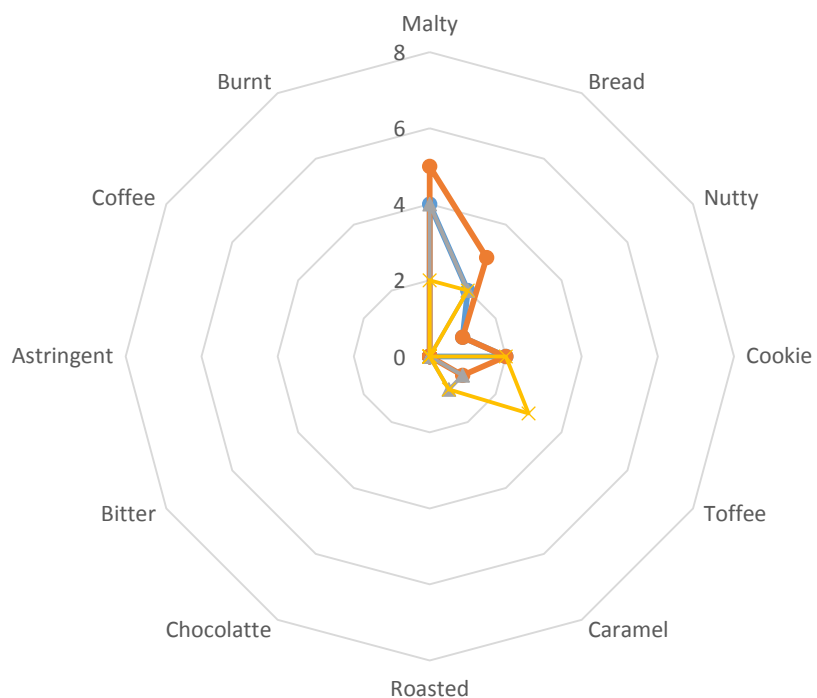


ROASTED



Legend for Black wheat malt:
 - Wort 5 % geroosterde mout D (Blue line with circles)
 - Wort 2,5 % geroosterde mout D (Orange line with circles)
 - Geroosterde mout D (Grey line with triangles)

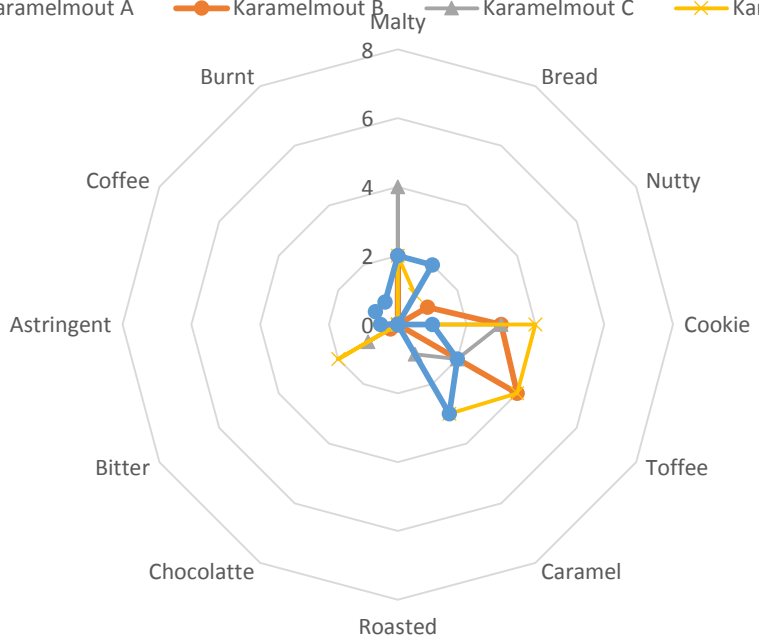
	Malty	Cookie	Bread	Toffee	Nutty	Caramel	Burnt/roast	Coffee	Chocolate	Bitter	Astringency	
Light coloured	X X	X	X	X	X							
Dark coloured		X	X	X	X							Malty flavour disappears.
Light crystal	X X	X		X		X	x					Sometimes a small roasted flavour can be observed
Dark crystal		X		X		X X	x	X		X	X	More intensive roasting leads to more expressed flavours
Light roasted	X	X			X							High amount of lager/pilsener malt can mask some flavours Black- wheat ≠ barley -malt
Dark roasted							X	X	X	X	X	



LIGHT
CAMELIZED

10% crystal + 90% base

● Karamelmout A ● Karamelmout B ▲ Karamelmout C ✕ Karamelmout D

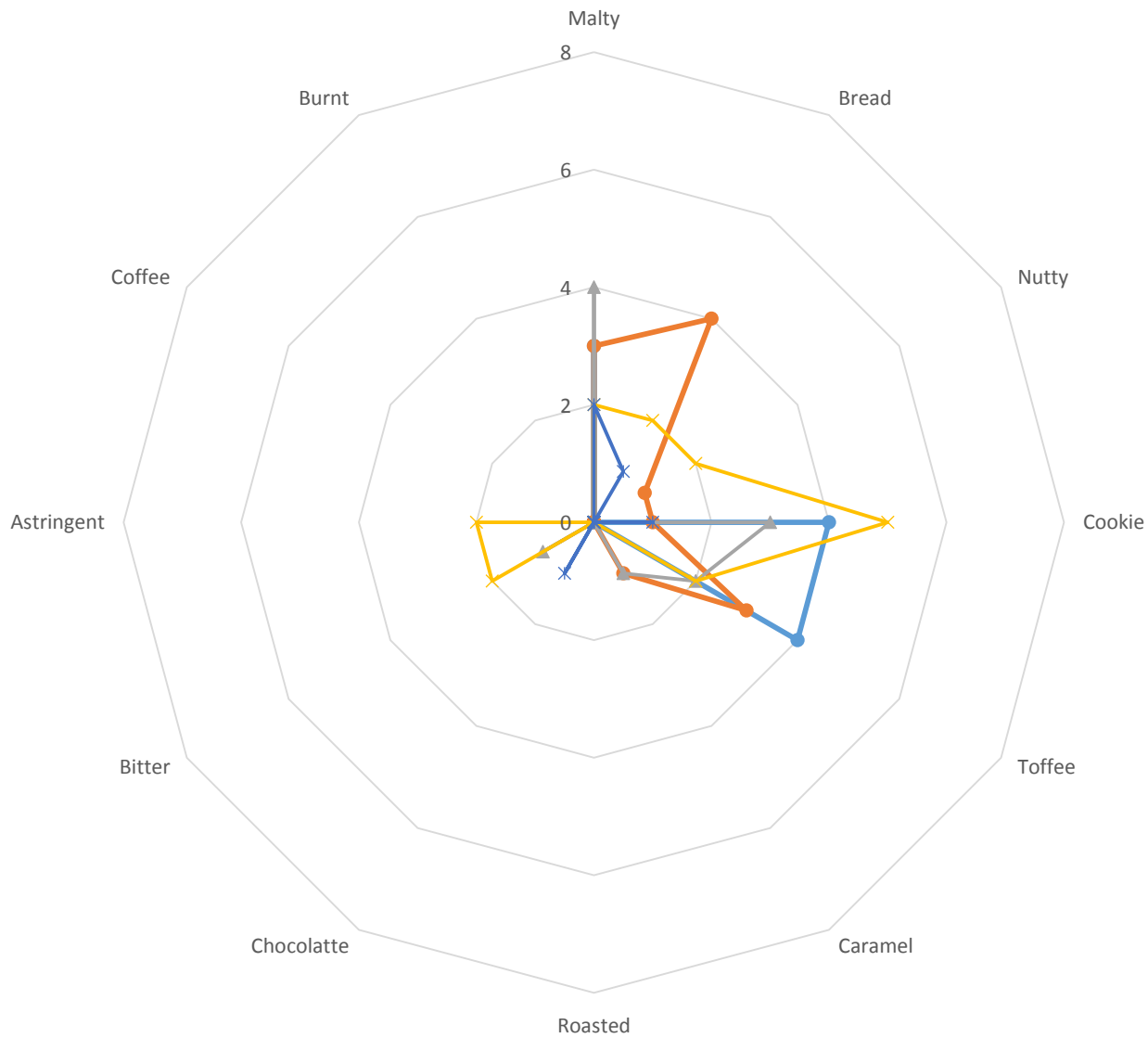


DARK
CAMELIZED

Bitter
Astringency
Burnt

Intensity ↓

● Karamelmout E ▲ Karamelmout F ✕ Karamelmout G ● Karamelmout H



30 EBC

● Wort 25 % SwaenMELANY

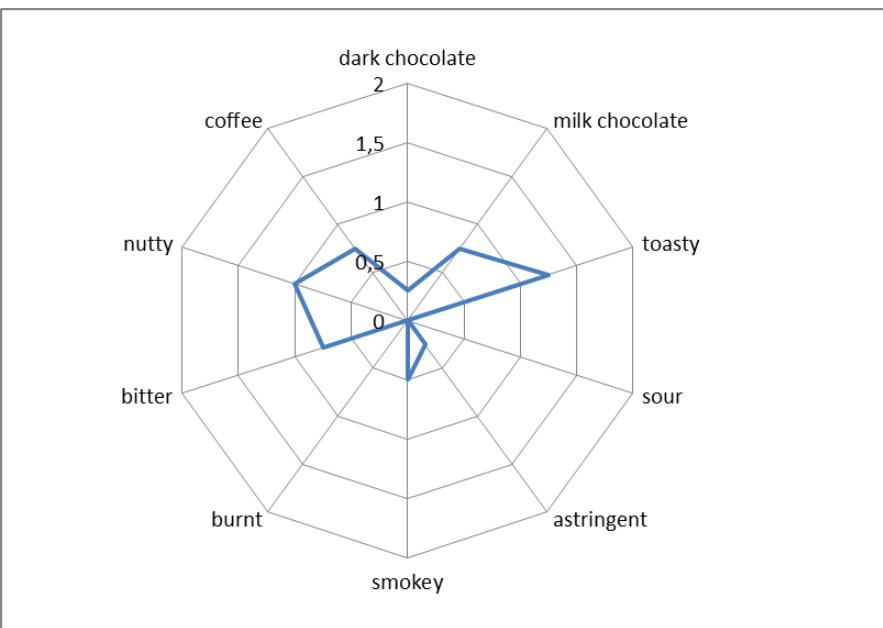
● Wort 25 % GoldSwaenAMBER

▲ Wort 10 % GoldSwaenBROWN

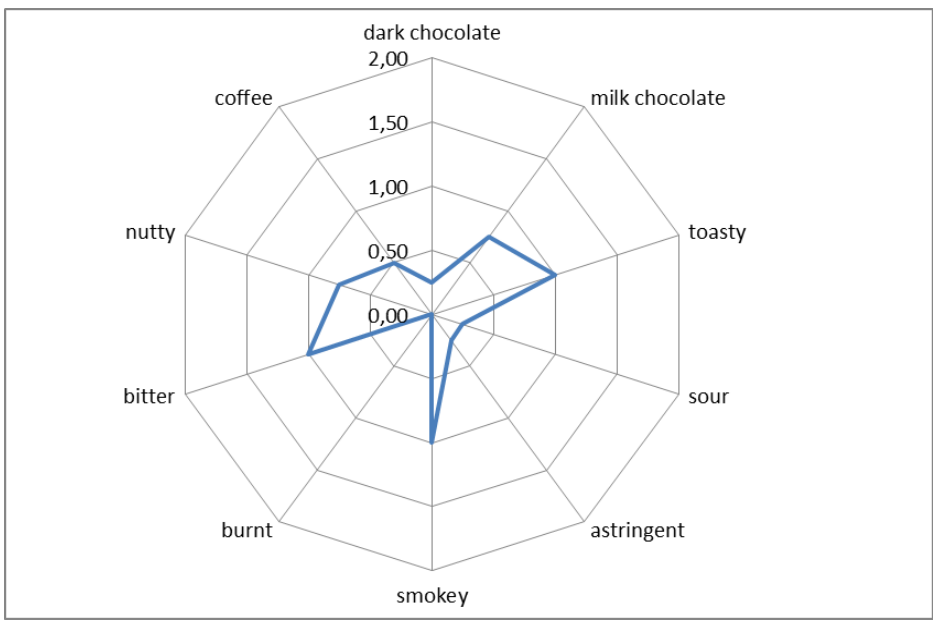
✕ Wort 25 % BlackSwaenHONEYBISCUIT

✧ Wort 2,5 % BlackSwaenEXTRABLACK

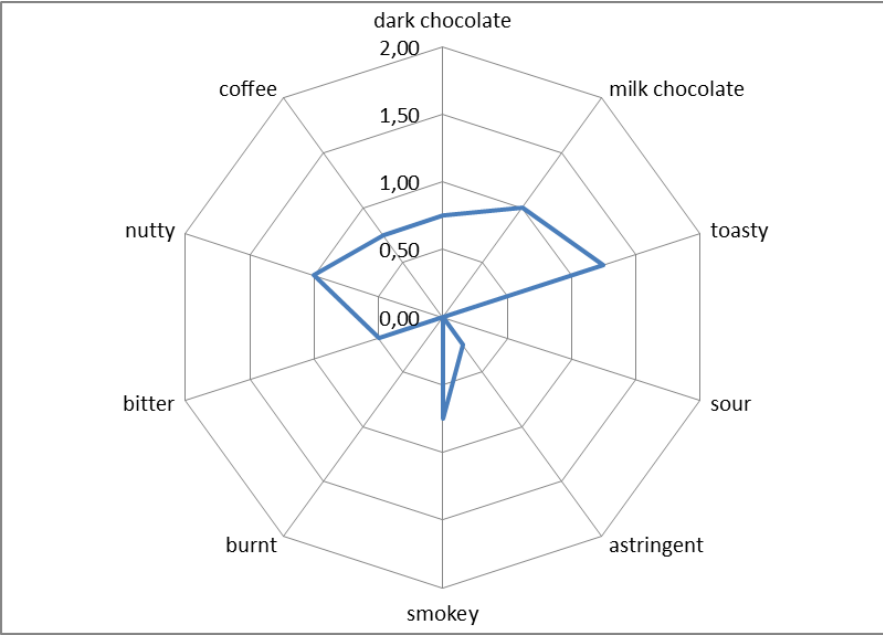
Black Swaen 950 EBC 165322



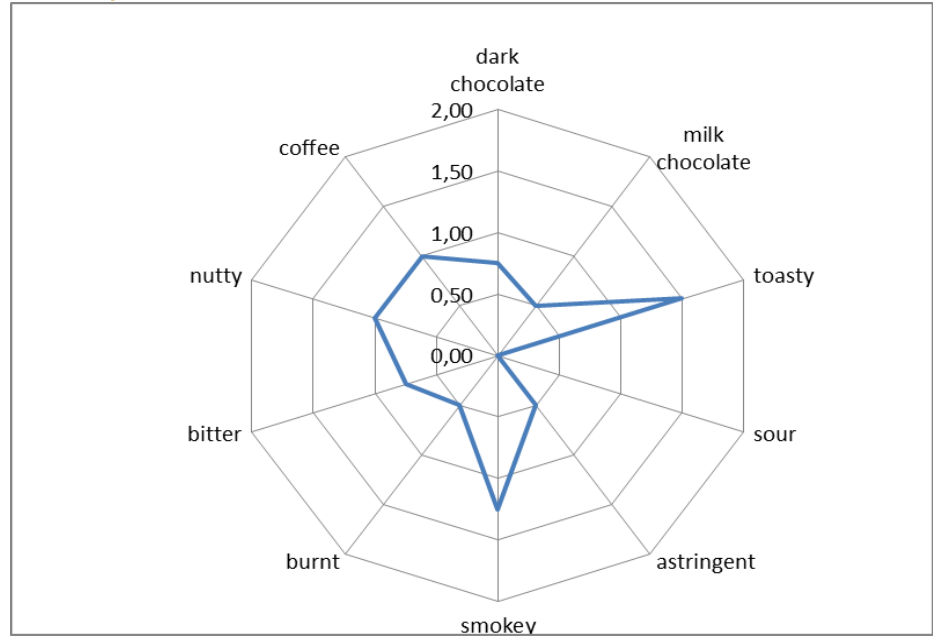
Black Swaen 1050 EBC 165326



Black Swaen 900 EBC 165329

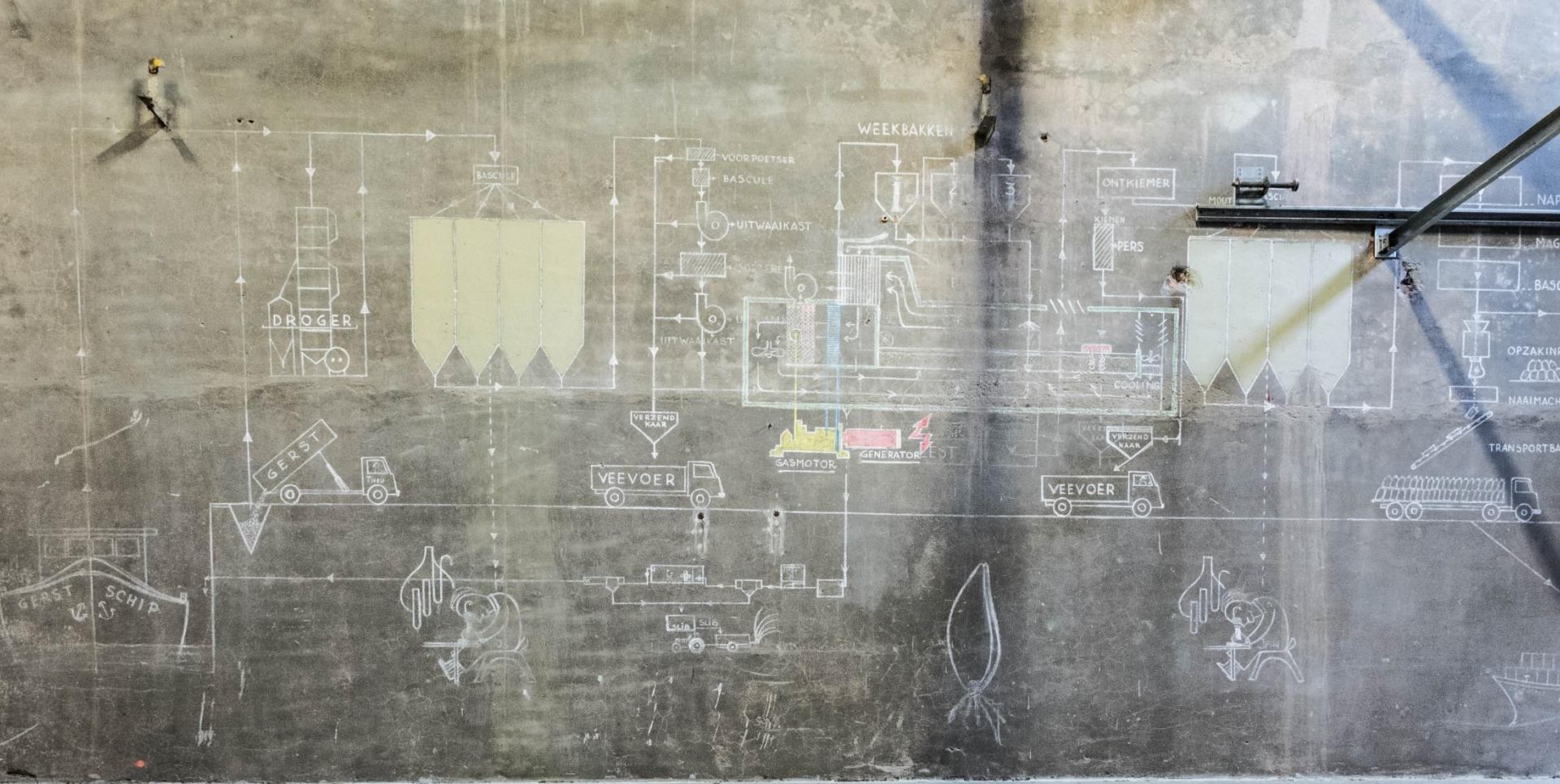


Sample customer 1050 EBC



WHY BEER IS SO NICE AND WHY CAN WE DRINK SO MUCH OF IT?

- German lab in Nurnberg has detected 13000 molecules possible interesting.....
- Aprox 7-tal very interesting
- Fenylethylamine
- Is only produced in germinating barley
- Reacts with the receptors for dopamine in the human brain.....



THANK YOU FOR YOUR ATTENTION



THE SWAEN

WEEK HO WAIET A' GRAT

SINCE 1886