

New apple and pear cultivars for production in Denmark

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Acknowledgement

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In 2010, apple cultivars from breeding stations all over the world were grafted and planted in Denmark. The cultivars were selected among cultivars thought to be suited for Danish conditions and climate. Especially looking for cultivars for long term storage or to fill the sales gap between Discovery og Aroma.

The cultivars were established at a planting distance of 3.5 x 1 m, on Rootstock M9. The cultivars were established in a randomized trial with 4 replicates of 5 trees and grown organically.

After the first five screening years 19 cultivars and selections were **deselected** due to: Susceptibility to pest and diseases, to late ripening for Denmark, poor fruit quality or to short shelf life: **Ginger Gold, Gaia, Smeralda, Your Choice, Apollo, Katja, Poul Sloth, Frosta, Goida, HL 1080, Flordika, Artika, Vysocina, Autento, A40R4T11, Tells 58/60, A987-74 Tells A587, Pomfital.**

After the first five screenings years 10 cultivars were selected for more complete investigations. The selected cultivars were: **Alkmene, Fragance, Galant, Galiwa, HL 782, Maribelle, Red Topaz, Sansa, Santana and Tells 47/05.**

Cultivar	Apple scab 2016		Canker on wood, summer 2017 1-9, where 1 = none	Apple sawfly damage % <u>infested</u> fruits at harvest 2016	Average 2016-2018		<u>Firmnes</u> At harvest 2018	Averages of 2017 and 2018	
	% <u>discarded</u> fruit at harvest	% infested fruit at harvest			Gross Yield Ton/ha	Fruit size G/fruit		<u>Eating quality</u> 1-9 1-9, <u>where</u> 9 = best	<u>apperance</u> 1-9 1-9, <u>where</u> 9 = best
<u>Alkmene</u>	0	2	1,3	28	14*	117	7,5	6,1	6,7
<u>Fragance</u>	0	14	1,8	34	21	224	8,4	5,6	5,5
Galant	4	30	1,3	26	32	115	9,3	5,3	6,2
<u>Galiwa</u>	0	8	1,6	52	14	165	8,9	6,1	6,9
HL 782	10	48	1,3	26	11	148	9,0	5,4	5,6
Maribelle	2	18	2,0	18	33	189	8,1	6,6	6,2
Red Topaz	0	2	2,8	32	20	169	8,0	7,3	6,9
Sansa	-	-	1,6	-	25	135	6,3	5,1	6,1
Santana	0	10	1,6	36	22	188	7,0	6,9	5,9
Tells 47/05	0	2	1,3	22	30	110	7,0	5,9	6,1

*planted 3 years later.

Organic production: Mechanically weed cleaning.
Sulphur, Armicarb, Isomate, Bt-products and NeemAzal

Recommended for organic production

- The standard cultivars Red Topaz and Santana are high yielding, with high fruit quality. It is difficult to find cultivars better than these.
- The older German cultivar Alkmene, showed a high yield and good taste. Alkmene is now recommended for organic growing in Denmark.

Promising cultivars for further testing.

- **Fragrance** (Czech Republic). Is a autumn cultivar, robust. with a good taste and high yield.
- **Sansa** (New Zealand). Is a summer cultivar, robust, sweet taste and a nice eating quality. Middle to high yield.
- **Tells 47/05** (Netherlands). Autumn cultivar, robust, nice taste and big stable yield.



Fragrance



Sansa



Tells 47/05

NOT recommended for organic production.

- **Galant** (Netherlands). Autumn cultivar, very susceptible to scab, small fruit and high yield.
- **Maribelle**: Becomes too big, susceptible for apple scab and sooty blotch.
- The selections **HL 782** is susceptible to apple scab and Topaz spot and the yield is low.
- **Galiwa** are not recommended due to a low yield and susceptibility to apple sawfly.

On farm testing of organic apple and pear cultivars (2016-2018)

By

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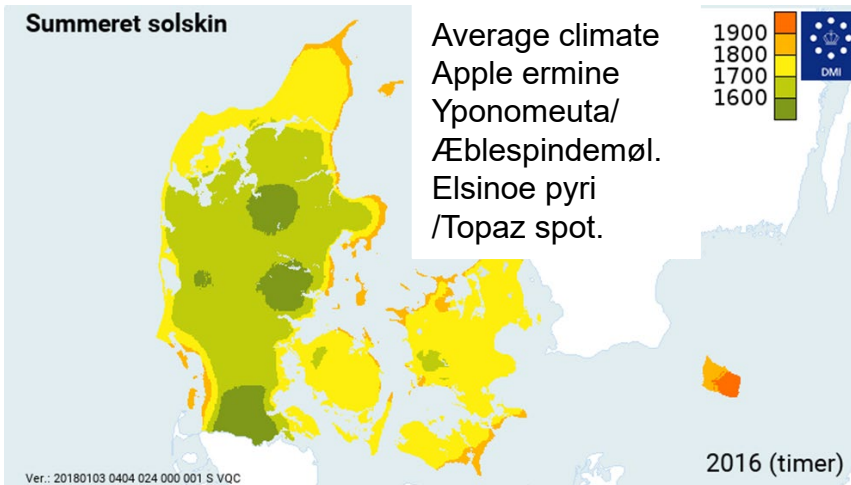
HortiAdvice Introduction and material and Methods

- Cultivar choice is one of the most important decision before establishment of production.
- Cultivars must have good taste, high yield, not be susceptible to pest and diseases and be durable.
- In 2016, 2017 and 2018, 29 organic apple and pear growers distributed throughout the country, were visited once every year in August/September.
- They were interviewed about their experience with their grown cultivars.
- Five trees of each cultivars were examined and scored for yield, infections of diseases and infestations of pests.
- In total 22 apple cider cultivars, 14 pear cultivars and 98 apple cultivars for fresh consumptions were assessed over the three years.



Summed sunshine (hours) for 2016-2019

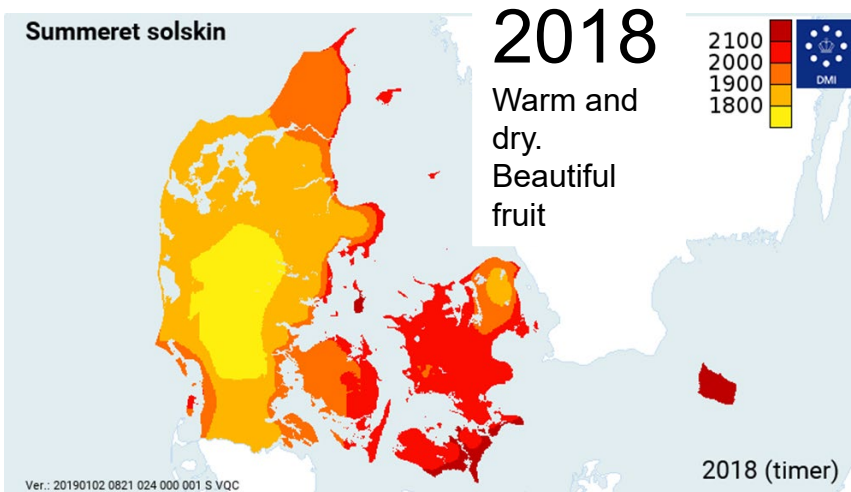
2016



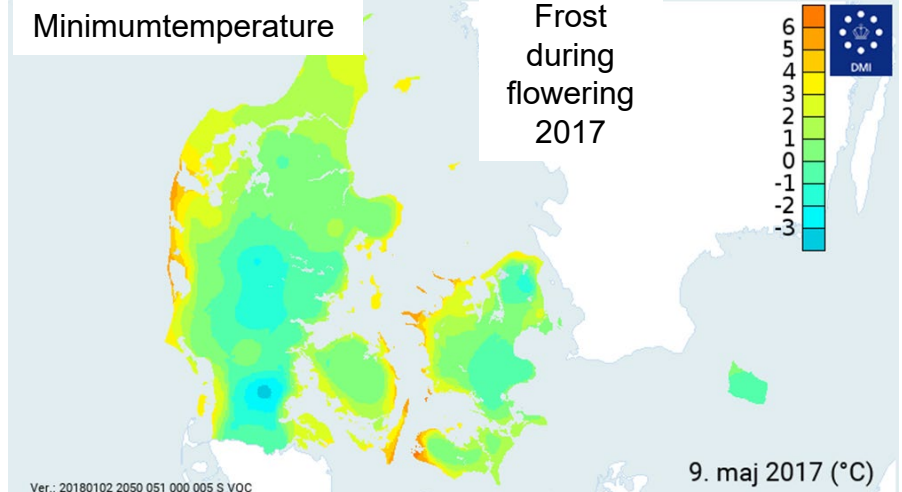
2017



2018




Minimumtemperature






All years were different.












Almost all cider cultivars are suited for organic production.

Cider apple cultivars	Recommended	Remarks
Avrolles		Some Elsinoe pyri
Bedan		
Binet Rouge		
Bisquet		Some Elsinoe pyri
Browns		
Clos Renaux		
Camelot		Some apple sawfly
Douce Coét Ligne		
Douce Moën		
Ellis Bitter		Some rosy apple aphid and larva damage
Foxhvelp		Some larva damage
Frequin Rouge		
Guillevéc		
Judaine ¹		Some Elsinoe pyri
Judeline ¹		Some Elsinoe pyri
Judor ¹		
Kermerrien ¹		
Major		Some rosy apple aphid and larva damage
Marie Menard		Some larva damage
Muscadet de Dieppe		Some larva damage
Petit Jaune Ligne		
Tremletts bitter		Some apple scab

1. The growers noted these cultivars as less robust, and they would not plant this cultivars again. Kermerrien is low yielding.

Pear Cultivars	Recommended	Notes from growers	Results from the examination
Anna	?	Some off years	Some pear scab, Pear leaf blister mites
Clara Frijs		Scab on branches destroy the trees	Very susceptible to pear scab
Concorde		Robust cultivar	Some scab
Conference		Robust cultivar	
Fritjof		Medium susceptible to scab	Susceptible to scab. Some pear leaf blister mites
Grev Moltke		Very susceptible to scab	Susceptible to scab. Some pear leaf blister mites and damage from larva.
Gråpære	?	Quite robust	No scab. Much European pear rust in 2017.
Hardy		Very susceptible to pear scab	Very susceptible to scab and Monilinia (Brown rot) Much pear rust and many pear leaf blister mites i 2017
Herrepære		Very susceptible to pear scab	Much scab
Ingeborg		Other pears are better	Much pear rust in 2017 and many pear leaf blister mites in 2018. Some damage from larvae.
Xenia/Katrine		Robust promising new cultivar.	Very little scab
Ludmitsa Mitchurina			Much pear rust in 2017
Skånsk sukkerpære		Pollinator cultivar	Middle pear rust in 2017
Tongre		Bitter, strange taste.	Much pear rust in 2017. Some damage from larvae.

Apple cultivars	Recommended for organic production	comments
Alkmene		
Aroma		Red clones
Belle de Boskoop		Red clones
Bramley		Juice
Discovery		If control of apple sawfly
Holsteiner Cox		
Red Ingrid Marie		
Pirouette (Rubinstep)		If control of apple scab
Topaz		If control of apple scab
Wellant		If control of fruit tree canker

Test cultivars: Ananas Reinette (special taste), Autento (New), Bellida (needs fungicides), Bodil Neergaard (mainly for industry) Bøgs Citronæble (for industry), Collina (early, needs fungicides), Coulon (best industry apple?), Dronning Louise, Elise, Elstar (needs fungicides), Fillippa, Guldborg, Høve Reinette, Katinka (suited for northern regions), Lundbytorp, Maribelle, Opal, Red Love (red flesh), Rembrandt, Sansa, Sunrice (needs fungicides), Witos.

Not recommended cultivars: Ahrista, Delcorf, Garvenstein, Ingelin, Jonagold, Mutsu, Prima, Raika, Rubinola, Santana, Shampion, Summerred, Zari.

Quick test of old unsprayed pear cultivars at AU Food Aarslev (2017-2018)

Cultivar	Origin	Growth	Harvest time	Gross yield/kg/tree		Recommendation for organic production
				2017	2018	
Alexander Lukas	Moldavia	Weak	Late September	15,7	12,0	Susceptible for pear scab
Anna	Norway	Weak	Mid-September	8,0	23,0	Thick peel and susceptible to pear scab
Carola	Sweden	Middle	Primo September	1,0	16,0	Robust, big pear with average eating quality
Celina	Norway	Middle	Primo September	2,0	8,4	susceptible to pear scab
Clara Frijs	Denmark	Weak	Primo August	-	17,0	Very susceptible to pear scab
Concorde	England	Middle	Mid-September	-	2,7	Robust fine eating quality
Conference	England	Middle	Mid-September	7,2	12,5	Robust fine eating quality
Fondante de Charneu	Belgium	Weak	Mid-September	-	15,8	Very susceptible to pear scab
Fritjof	Norway	Weak	Mid-September	13,7	24,9	Some scab average eating quality
Grev Moltke	Denmark	Weak	Mid-September	.	8,1	Very susceptible to pear scab
Ingeborg	Norway	Middle	Mid-September	1,8	8,3	Robust, average eating quality
Kristina	Norway	Middle	Late August	1,3	5,4	Very susceptible to pear scab
Delbard Premiere	France	Middle	Mid-July	6,3	1,3	Very susceptible to Brown rot

Frost damage during flowering 2017



HortiAdvice To day: New pear cultivars for organic in Denmark

- Area with pears in Denmark 2022: Totally 284 Ha, approximately 10 % organic.
- Lack of organic pears. New cultivars need to be robust, have a good taste and high yields.
- In 2021-2022, five pear cultivars were planted for test at two organic growers in Denmark.
- Carola: Swedish cultivar
- Ingeborg: Norwegian cultivar
- Celina (QTee) Norwegian cultivar
- Gräfin Gepa, German cultivar, pollinator for Xenia, Xenia is robust and are planted in Denmark.
- Conference grafted on rootstock Quince Eline, to test level of russeting on the fruit.

- Total 1421 ha apples an approximately 38 % organic.
- In cooperation with the Dutch advisory company **Fruitconsult**.
- **2022, 14 new apple cultivars were planted on three locations in Denmark.**
- The cultivars were also planted on one location in Sweden and on the research station Randwijk in Holland.
- The cultivars are robust against apple scab. In Denmark they will be grown conventionally and at Randwijk organically.

Ripening time:

Early	Summercrisp	Deljonca	MN 55 (Rave/First Kiss)
Middle	Minneiska (SweeTango)	WURsixo	WUR 15 (Wurfiftina)
Middle-late	WURanda	ZOUK37	
Late	PIA 41	Daliclass	Ladina
Latest	ZOUK32 (Coriphee)	WURtwinning (WUR29)	Shalimar



HortiAdvice Minneiska/SweeTango



Photo: Maya Bojesen (Fynen 31. August 2022)