

On farm testing of organic apple and pear cultivars

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Abstract

In 2016, 2017 and 2018, 29 organic apple and pear growers were visited once in august/September and interviewed about their experience with the grown cultivars. All cultivars at each orchard were examined and scored for yield, infection of diseases and infestations of pests. In total 22 cider cultivars, 98 apple cultivars and 14 pear cultivars were assessed over three years. The cultivars were rated in the most robust cultivars, cultivars which may be potential for organic growing and cultivars that is not suited for organic growing in Denmark. Most cider cultivars are robust, Concorde and Conference pears are the most suited for organic growing. Alkmene, Red Aroma, Red belle de Boskoop, Bramley, Holsteiner Cox, Red Ingrid Marie, Pirouette (Rubinstep) and Topaz are suited for organic apple production in Denmark.

Keywords: Apple, pear, cultivar, on farm testing

Introduction

In 2020 we in Denmark had 528 ha of organic apples. 35 % of the total apple area. In 2020 we had 28 ha of organic pears. 10 % of the total pear area in Denmark. 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.

To investigate which cultivars are most suitable to the Danish climate, we made a grower's survey and an on-farm assessment of the actual grown cultivars with the aim to find the most durable cultivars in Denmark with respect to the farmers experience.

Material and Methods

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 cultivar 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.

Results

All years were climatical very different. 2016 was an average year, 2017 was wet and we had frost during flowering, 2018 was very warm and dry. The ripening time varied up to 4 weeks at different locations in Denmark. In cider production nearly no growers used the organic allowed plant protection products. The average yield was 6-7 ton per ha in cider production. If apple growers used the allowed plant protection products in fruit for fresh marked the average cross yield was 21 tons per ha and if the trees were unsprayed the yield was 11-12 ton per ha. For pear growing the unsprayed orchards had 7-8 ton per ha and the sprayed had 15 ton per ha (Table 1).


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
Table 1. Estimated gross yield in ton per ha. Depending on the use of plant protections agents. Average 2016-2018.

Ton/ Ha	Does the fruit grower use fungicides?			Average Cross yield
	Yes	Little	No	
Cider apple	No body	9,5	6,5	6,5
Pear	15,2	3,6	7,2	9,9
Apple	20,6	16,9	12,1	15,9
Ton/ Ha	Does the fruit grower use insecticides?			Average cross yield
	No	Little	No	
Cider apple	No body	4,5	9,6	6,5
Pear	15,0	4,7	8,7	9,9
Apple	20,6	14,8	11,4	15,9

The apple cultivars were rated in the most robust cultivars which is recommended for production in Denmark. They are marked with , which is the Danish organic logo for 'National organic controlled'. Test cultivars are cultivars may be potential for organic growing but needs further testing and cultivars not recommended is very susceptible to apple scab.

Most cider cultivars were robust, Concorde and Conference pears were the most suited for organic growing. Alkmene, Red Aroma, Red belle de Boskoop, Bramley, Holsteiner Cox, Red Ingrid Marie, Pirouette (Rubinstep) and Topaz are suited for organic apple production in Denmark (Table 2, 3 and 4).

Table 2. Evaluated cider apple cultivars, recommendations, and notes.

Cider apple cultivars	Recom- mended	Remarks
Avrolles		Some <i>Elsinoe pyri</i>
Bedan		
Binet Rouge		
Bisquet		Some <i>Elsinoe pyri</i>
Browns		
Clos Renaux		
Camelot		Some apple sawfly
Douce Coét Ligne		
Douce Moën		
Ellis Bitter		Some rosy apple aphid and larva damage

Cider apple cultivars	Recom-	Remarks
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	mended	
Foxhvelp		Some larva damage
Frequin Rouge		
Guillevec		
Judaine ¹		Some <i>Elsinoe pyri</i>
Judeline ¹		Some <i>Elsinoe pyri</i>
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 these cultivars again. Kermerrien is low yielding.

Table 3. Evaluated pear cultivars, recommendations, and notes.













Pear Cultivars	Recom mended	Notes from growers	Results from the examination
Anna	?	Some off years	Some pear scab, Pear leaf blister mites
Clara Frijs		Scab on branches destroys 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.

Table 4. Evaluated apple cultivars, recommendations, and comments.

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 are cultivars which are promising and the producers like them, but there have been very few orchards growing these cultivars and therefore information is not adequate. Not recommended cultivars are cultivars which were very susceptible to apple scab.

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, Champion, Summerred, Zari.

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