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Development of an Organic Table Grape Production and Market in Switzerland

A. Häseli¹, J.-L. Tschabold¹, F. Suter¹ and F.P. Weibel¹

Abstract

In Switzerland there is an increasing consumer demand for residue-free, organic table grapes. The organic cultivation of table grapes, however, is very delicate in humid climates and experience to advice organic growers is still lacking. The goal of our project that has started in 2004 is to develop and establish a cultivation system for organic table grapes under Swiss climatic and economic conditions with a high yield security and fulfilling the high quality demands of the market. Preliminary results: Interesting cultivars to produce are e.g. Fanny, Lilla, Palatina. However they are disease susceptible and must be produced under a rain roof. Better suited cultivars still need to be found. Consumer acceptance for organic table grapes produced in Switzerland is very positive. However changes towards new cultivars and lower production costs are necessary. Spray programs to achieve sufficient disease protection and no spray blotch seem to be realizable, mainly for production under rain roof.

Keywords: Table grapes, cultivar, plant protection, consumer acceptance

Introduction

In Switzerland there is an increasing consumer demand for residue-free table grapes. Thus, there is a raising potential for local organic production of this fruit. The organic cultivation of table grapes, however, is very delicate in humid climates and experience to advice organic growers is still lacking. Currently there are 8 producers with around 7.2 ha in production (most of it very young). The main cultivar is Muscat Bleu (72% of acreage), the production of white cultivars (Lilla, Fanny, Palatina, Birstaler Muskat) reaches only 18 %. The goal of our project that has started in 2004 is to develop and establish a cultivation system for organic table grapes under Swiss climatic and economic conditions with a high yield security and fulfilling the high quality demands of the market. The specific challenges are that the market is asking for cultivars showing a large sized berries, no, small or only few seeds, immaculate appearance of the skin e.g. no traces of plant protection products, and a high sensory quality in terms of sugar and flavour content and shelf-life. Additionally, Swiss organic table grape producers are exposed to a harsh competition of imported low-price organic table grapes from South Europe.

Material and Methods

Cultivar testing trials: We are testing table grape cultivars under 100% organic conditions at different sites: i) a precision trial at Frick with 17 cultivars in two systems with and without rain roof (system "Brühwiler") both with drip irrigation. In each system there are 2 replicates of 3 plants per cultivar. A minimal plant protection program during highest infection period (pre-flower at beginning of June until July) is applied to guarantee the survival of the susceptible cultivars with 3 applications of acidified clay powder (Myco-Sin with 5-6 kg/ha, treatment).

¹ Research Institute of Organic Agriculture, FiBL; CH-5070 Switzerland

ii) Five On-Farm trials at Vétroz and Aubonne in West Switzerland, and in Willisau, Egolzwil and Kaisten in Central Switzerland; there are/were 4 to 22 cultivars under observation.

Consumer acceptance and marketing issues: Location: Migros-Supermarkets at Crissier and Pully. Consumers judged globally the valuation of the cultivar (combining look and taste) on a scale from 1-9. Additionally, the consumers were interviewed about their attitude and buying behaviour in respect to table grapes in particular from organic and Swiss production (the questions asked are given in the chapter results).

Plant protection trials: In a trial at Frick with cultivars Lilla and Nero and a trial at Kaisten with cultivars Lilla and Fanny we compare 5 different spray programs since 2006 and with 4 replicates per treatment (description see Fig. 4) and cultivar. Timing of applications: 1st at pre-flower (beginning of June) next 4 every 10-12 days. At Frick the plant protection trials are carried out in blocs with and without rain roof. Under the rain roof the predominant disease is *Uncinula necator*; without rain roof it is mainly *Plasmopara viticola*. Recordings on disease infestations are made twice a year in July and September. There we record plant-wise the incidence and severity of disease attack on leaves and grapes.

In parallel we run studies on *quality improvement; storage and shelf-life, production technique and economy*. These results will be shown in later publications.

Preliminary Results

Cultivar testing:

In Fig. 1 results of the disease susceptibility of the different cultivars tested is shown with the data of the trial at Frick in 2007. These results are well in line with the findings in previous years at Frick and at the other locations (data not shown). Without a rain roof clear

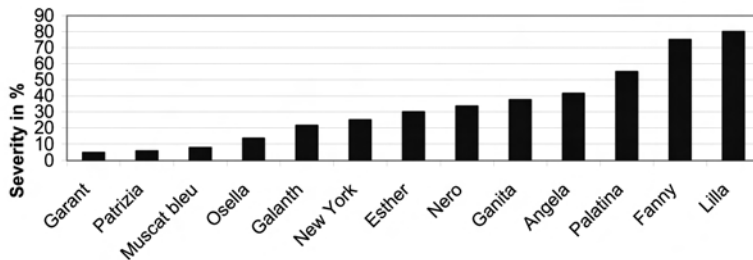


Fig. 1: *Plasmopara viticola* infestation on leaves in October 2007 (% of leaf area) of the table grape cultivars tested at Frick without rain roof.

differences on *Plasmopara viticola* susceptibility (on leaves) can be found with Garant, Patrizia and Muscat bleu as very tolerant and Lilla, Fanny, Palatina as highly susceptible cultivars.

In the test block which is protected by a rain roof *Ucinula necator* has ideal conditions to develop (Fig. 2). We found two clearly distinct groups of susceptibility (on leaves): highly tolerant were Palatina, Osella, Prima, Patrizia, Garant, Nero, Galanth, Muscat bleu, Lilla and Fanny. Highly susceptible were Ora, Ganita, New York, Sulima, Angela, Exalta and Esther. To assess the yield and quality potential of these cultivars our trials are still to recent to draw conclusions (data not shown).

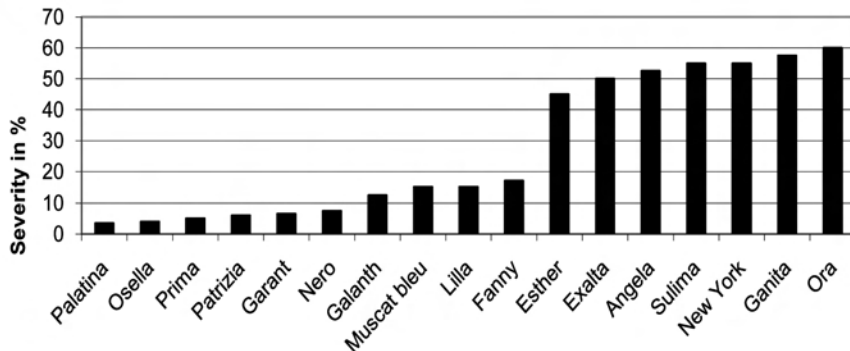


Fig. 2: *Uncinula necator* infestation on leaves in October 2007 (% of leaf area) of the table grape cultivars tested at Frick with a rain roof.

Consumer acceptance and marketing issues

The consumer acceptance tests at the Migros Super markets revealed that the “organic” cultivars reached a high acceptance with average scores from 8.1 (9 is maximum) with Palatina to 6.5 (Ontario) without significant differences between cultivars. All new cultivars scored better than the standard conventional cultivar Uva Italia (5.8).

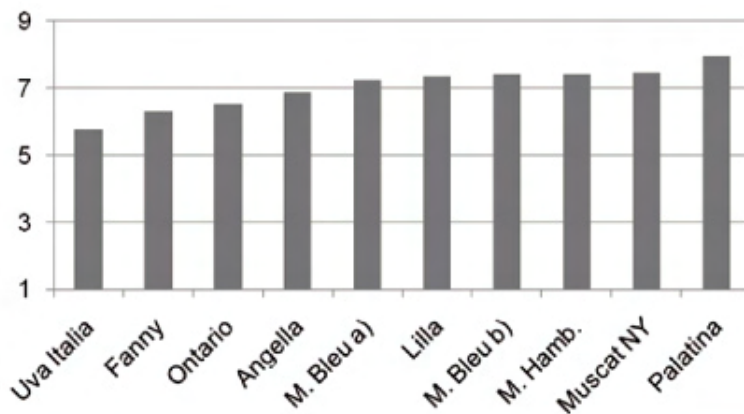


Fig. 3: Score of consumer evaluation (appearance and taste) of different table grape cultivars (n = 132); 1 = poor, 9 = excellent.

In the consumer interview the following answers are remarkable:

- 67 % of the 51 consumers prefer white, 23 % red and 10 % pink table grapes
- In order to buy more table grapes 153 consumers indicated that Swiss origin (28% of the answers), lower price (27%) and better quality (23%) are more important than organic production (18 %).
- The reasons to buy organic table grapes were “better for health” with 32 % answers (n = 61); “better for the environment” 27 %, “better taste” 23%, “free of residues” 18%.
- The reason NOT to buy organic were “too expensive” (35% of answers; n = 82); “I don’t believe in a superior quality of organic” 33%; “no/irregular offer” (15%); “no better taste” (11%); “poor appearance” (1%).
- On the question how much price-bonus they are ready to pay for organic table grapes 49% of the consumers (n = 57) answered 0 extra, 5% would pay 2.5 € more per kg, 40% would pay 4 € more, 5% would be ready to pay 5 € more, but 0% would be prepared to pay more than 5 € per kg.
- “Which package do you prefer”: 33% of the consumers (n=144) prefer bags, 32% open selling in shelf crates, and 26% a small box with a cap (which has become, by now, the usual package); and only 9% like a small box without cap.

Plant Protection

The effects of the spray treatments against *Uncinula necator* and on spray blotch in the trial at Kaisten (cv. Lilla; with rain roof) are shown in Fig. 4. Among the tested products only Heliosoufre and AQ10 (*Ampelomyces quisqualis*) showing a reduction of 65% and 58%, respectively, had a significant effect compared to the untreated control. A similar, but not significant efficiency was found with wettable sulphur (56%) and Fenicur (fennel oil; 51%). Armicarb (Potassium-bi-carbonate), however, was not effective (20%) and lead to severe phytotoxic symptoms on leaves (data not shown). However, more trials under conditions of higher disease pressure are necessary before drawing practical conclusions. Unacceptably much spray blotch appeared with Heliosoufre. The slight blotch with wettable sulphur and Fenicur are still in an acceptable range. No blotch was found with AQ10 and Armicarb.

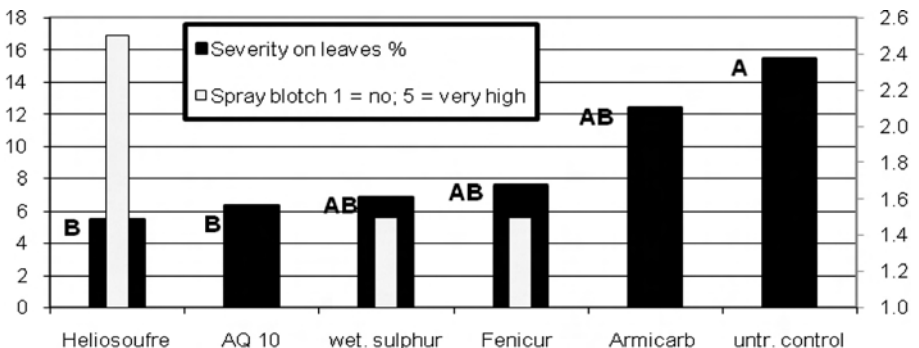


Fig. 4: Effect of different organic-compatible fungicides (4 applications) on severity of *Uncinula necator* on leaves (in %; left axis), and on severity of spray blotch on grapes (0 = no blotch, 5 = very much blotch; right axis).

Discussion and Conclusions

The trials and On-Farm monitoring confirmed the high disease tolerance of Muscat Bleu, currently the most produced cultivar, even in extensive production systems without rain roof. In contrast to that, the big-berry and white cultivars as they are much more requested by the market, like Lilla or Palatina, are quite highly disease-susceptible for organic production, and compulsorily require a rain roof protection and the application of fungicides. Thus, the challenge to find better suited cultivars remains on a high priority level.

The sensory tests with consumers showed a very positive result, proving that the indigenously produced table grapes have a very good acceptance compared to imported table grapes. The consumer interviews showed that organic produced grapes are a highly appreciated product. However, changes and improvements should be made in the production towards more white cultivars, big berry size, moderate price and attractive look and package. Finally, it appears that smart consumer information on the added-value of organic table grapes is necessary.

Our results on plant protection are still very preliminary. It seems that for a production under a rain roof against *Uncinula necator* there are sufficiently efficient and not blotch-forming organic-compatible products are available (e.g. AQ10, Fenicur, wettable sulphur). At present, without a rain roof the “modern” cultivars like Fanny and Lilla cannot be produced with sufficient yield security (*Plasmopara vit.*, *Botrytis cin.*).

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