



Scanning report Markus Kelderer, LAI

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Country: Italy

NUTS 3 region(s)¹: ITH10 Bozen-Bolzano, ITD20 Trentino-Alto Adige

WP no. and title: 3 – Reduction in pesticides residues

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Y1 report due May 2016 for the period 03-16 to 05-16

Source materials and methodology

I got the information from:

a) Checking up the issues from the last 5 years of the technical magazines:

Obstbau-Weinbau, Südtiroler Landwirt, Terra Trentina, Rivista di frutticoltura, Informatore Agrario, Apfel aktuell, the guidelines of the Workgroup for Integrated Fruit Production in South Tyrol

b) Speaking with the quality managers of the South Tyrolean Associations of Fruit Growers Co-operatives, the South Tyrolean Advisory Service and the plant protection experts from the Research Centre Laimburg

c) Quoted publications

Best practice findings – State of Art

Residues on fruits from IP orchards

- **Retailers have different requirements:**

- Number of residues: e.g. of residues max. 4-5 residues
- Quantity of residues: e.g. restriction to 30% of some active ingredients MRL
- Restriction on sum of residues: e.g. 15 % MRL of captan + 29 % MRL of Delan
- From some active ingredients.: no residues

- **Babyfood : 0 residues, organic apples**

e.g. (Wolfgang Graiss: VIP Quality Management, oral statement, 25.05.2016)

→ The IP farmers complain about the continuous changes for the residues; the risk of losses in the time of storage is raising

Plant protection in IP production & residues

- Active ingredients (a.i), number of treatments, application rate and pre-harvest interval are defined at national and regional level
- IP in South Tyrol is defined from the WG Agrios (SBR, VOG, V.IP etc., including foliar fertilizers (amino alcohols, morpholines ecc.)
- Residues on fruit lower than 50 % of MRL

¹ Please see ec.europa.eu/eurostat/ramon/nomenclatures/ for details on NUTS regions, level 3

→ Very important in this context was the introduction of mating disruption against Coddling Moth (~ 100%); since more than 25 years in South Tyrol and neighbouring Trentino

e.g. (AGRIOS: http://www.agrios.it/doc/agrios_richtlinien_2016.pdf, 30.05.2016)

- Important are independent field trials with new active ingredients, new formulations, biotechnologies against pests, application techniques and disease on different varieties checking efficacy, side effects and residues

e.g. (Rizzolli W., Acler A. (2012). *Movento 48 SC, ein neues Insektizid gegen Läuse im Apfelanbau.*

Obstbau-Weinbau, 49 (4), 125-131.)

e.g. (Rizzolli W., Acler A. (2011). *Geoxe, ein neues Mittel gegen pilzliche Krankheitserreger im Apfelanbau.*

Obstbau-Weinbau, 48 (12), 384-389.)

e.g. (Rizzolli W., Acler A. (2010). *Affirm – Versuche gegen Fruchtschalenwickler.*

Obstbau Weinbau 47 (5), 185-189)

- Aim is not the scientific publication but the background for the decisions of the WG Agrios

e.g. (AGRIOS: http://www.agrios.it/doc/agrios_richtlinien_2016.pdf, 30.05.2016)

- Residue monitoring in IP-production 1 sample at harvest for 2000 t

- The reports are owned by the Growers Association, they are not public

- Checking the technical magazines (Obstbau/Weinbau; Südtiroler Landwirt, Apfel aktuell, rivista di frutticoltura from the last 5 Year) common consensus everything is under control

e.g. (Waldner W., Zelger R. (2008): *Pflanzenschutzmittel-Rückstände im Südtiroler Obstbau,*

<http://www.obstbauweinbau.info/obstbauweinbau/archiv.php?s,1639/>, 30.05.2016)

e.g. Zelger R. (2013). *PSM-Rückstände ohne Gefahr. Apfel aktuell, Nr.1, 03/2013, S.12-13)*

e.g. (Zelger R. (2014). *PSM-Rückstände: Vorgabe bei weitem erfüllt. Apfel aktuell, Nr.1, 04/2014, S.26-27)*

e.g. (Zelger R. (2016). *PSM-Rückstände unbedenklich. Apfel aktuell, Nr.1, 03/2016, S.34-35):*

→ Monitoring harvest 2015: n samples: 490

Samples positive: 487 (99,4%)

N individual residues: 1914

N fungicidal residues: 1824 (95,3% of all residue; Apple scab, *Alternaria*)

Fungicidal PPP residues: 61,2 % Captan, Dodine + Phosphonates

N residues insecticide, acaricide: 90 (4,9%; codling moth, *Chlorantranilprole*)

Plant protection in organic production & residues

- Organically grown apples from South Tyrol are normally free of relevant residues

- From the organic PPP you find: copper and sulphur

e.g. (Kelderer M., Matteazzi A. und Casera C. (2004). *Residues of copper and sulphur on fruits from organic orchard. 11th International Conference on Cultivation Technique and Phytopathological Problems in Organic Fruit-Growing.*

Förderungsgemeinschaft Ökologischer Obstbau e. V. Weinsberg, (11), 213-216)

- Spinosad (§), PBO (§²) are not allowed, and Neem (§²³) used only early in the spring

e.g. (§ Cavanna S., Kelderer M. and Topp A. (2012). *Residue decline behaviour of the natural insecticide spinosad on apples. Proceedings of the 15th International Conference on Organic Fruit-Growing, 91-97)*

e.g. (§² Südtiroler Beratungsring: *BioLeitfaden 2016, p. 209-212)*

e.g. (§³ *BiolandGermany:30.05.2015*

http://www.bioland.de/fileadmin/dateien/HP_Dokumente/Richtlinien/Bioland_Standards_2016-03-14.pdf)

- Monitoring with samples in every organic farm (1-3 samples/ year)

Organic farming and drift from IP production

- The farms in South Tyrol are small and divided in parcels (min. 3.000 m²)
- There are problems with contamination from IP production (phosphites !!)
- The GA proposed an agreement for a peaceful neighbourhood between organic & IP
e.g. (Südtiroler Beratungsring: Leitfaden Apfel 2016, S.156-198)
- Some organic growers complain
- The cooperatives BioSüdtirol and Bio VI.P made a risk evaluation from the borders to conventional land
- Monitoring plan includes samples from these risk evaluation (paid by the organic growers and by the cooperatives)
- Once a season every organic farmer is controlled by at least one examination
e.g. <http://www.biosudtirol.com/>
e.g. <http://biography.vip.coop/de/home/1-0.html>

Pesticide-drift to private and public areas

- New law in our province which regulate these topic
e.g. (Südtiroler Beratungsring: Leitfaden Apfel 2016, S.192-208)

Activities RC Laimburg with an impact on residues on fruits

- **Field trails with new and alternative Plant Protection Products**
e.g. (Rizzolli W., Acler A. (2013). Kanemite, ein neues Akarizid für den Apfelanbau. *Obstbau-Weinbau*, 50 (4), 120-125.)
- **Biology of pre harvest and post harvest disease and monitoring of infection conditions**
e.g. Marschall K., Gölles M., Gallmetzer A., Naef A., Kelderer M. (2014). *Marssonia Blattfleckenkrankheit, Beobachtungen und erste Versuchsergebnisse. Obstbau Weinbau* 51 (7/8), 236-239.
- **Single row netting (codling moth and others)**
e.g. (Kelderer M., Lardschneider E., Rainer A. (2014). *Crop regulation with single row netting structures and their influence on crop quality. Proceedings of the 16th International Conference on Organic Fruit - Growing from February 17th to February 19th, 2014 University of Hohenheim, Germany, 127-131*)
→ In South Tyrol experimental stage, rest of Italy some applications (see rating table at the end)
- **Coverage (Keep in Touch®) to protect the trees from the rain avoiding pathological infections**
e.g. (Kelderer M., Casera C., Lardschneider E., Telfser J., Topp A., Mescalchin E. (2015). *Neues aus dem ökologischen Obstbau. Auswahl von Versuchen zum ökologischen Obstbau in der Region Trentino-Südtirol. Obstbau Weinbau* (52/11), 338-340.)
→ see rating table at the end
- **Field trials with alternative products against disease (Co-free, AltRameBio)**
 - o **Carbonates:**
e.g. Kelderer M., Casera C., Tamm L., Schmitt A., Parveaud C.-E., (2016). *Open-field trials for the control of apple scab conducted within the FP 7 Project CO-FREE in Italy and France. Proceedings of the 17th International Conference on Organic Fruit - Growing from February 15th to February 17th, 2016 University of Hohenheim, Germany, 32-44.*
e.g. (Kelderer M., Casera C., Lardschneider E. und La Torre A. (2010). *Preventative and curative applications of carbonates against apple scab (Venturia inaequalis) in organic apple orchards. 14th International Conference in Organic Fruit-Growing – Eco-fruit, Fördergemeinschaft Ökologischer Obstbau e. V. Weinsberg, Stuttgart, Deutschland, 52-60*)
e.g. (Kelderer M., Casera C. und Lardschneider E. (2006). *First results of the use of potassium bicarbonate against scab in South Tyrol. 12th International Conference on Cultivation Technique and Phytopathological Problems in Organic Fruit-Growing, Fördergemeinschaft Ökologischer Obstbau e. V. Weinsberg, (12), 93-97*)

o Lime sulphur:

e.g. (Kelderer M., Lardschneider E., Telfser J. (2014). *Interactions between varieties, lime sulphur and hailnet on the thinning effect and on side effects using paraffin oils as a June drop thinner. Proceedings of the 16th International Conference on Organic Fruit - Growing from February 17th to February 19th, 2014 University of Hohenheim, Germany, 132-141)*

e.g. (Kelderer M., Casera C. und Lardschneider E. (2006). *Phytotoxicity of different sulphur products applied with the sprayer or with the overhead irrigation system on Braeburn apples. 12th International Conference on Cultivation Technique and Phytopathological Problems in Organic Fruit-Growing, Fördergemeinschaft Ökologischer Obstbau e. V. Weinsberg, (12), 228-233)*

→ see rating table at the end

• **Post harvest techniques**

e.g. (Zanella, A. (2014). *Fruchtqualität während der Lagerung erhalten: Die Wichtigkeit des optimalen Erntetermins. Obstbau Weinbau 51 (7/8), 232–235)*

e.g. (Zanella A. (2009) *DPA-Alternativen für die Lagerung von Red Delicious im Vergleich: ILOS+, SmartFresh (1-MCP) und dynamische CA (DCA). VI.P Blick (1), 14.)*

→ see EUFRUIT WP 4 (post harvest)

• **Hot water dipping**

e.g. (Kelderer M., Casera C., Lardschneider E. und Rainer, A. (2010). *Controlling Gloeosporium rot on Pinova apple fruits. Part 1: preharvest acid clay sprays versus postharvest hot water dipping treatments. 14th International Conference in Organic Fruit-Growing – Eco-fruit, Fördergemeinschaft Ökologischer Obstbau e. V. Weinsberg, Stuttgart, Deutschland, 78-85)*

→ At the moment not applied in practice except in South Italy for citrus; but there is a high interest mainly in organic for apples, pears, peaches etc.; see rating table and photo at the end

• **Physical Barriers between organic & IP**

e.g. (Telfser J., Kelderer M. (2015). *Einsatzmöglichkeiten für Mehrzwecknetze im Obstbau. Besseres Obst (Nr.3/2015), 32-34.)*

→ see rating table and photo at the end

• **Alternatives to herbicides (low impact on residues)**

e.g. (Kelderer M., Lardschneider E., Giacomuzzi V. (2014). *Die Pflege des Baumstreifens – Alternativen zum Herbizid. Obstbau Weinbau 51 (1), 10-13.)*

e.g. (Kelderer M., Casera C. und Lardschneider E. (2006). *What can we expect from the commercially available bio-herbicides. 12th International Conference on Cultivation Technique and Phytopathological Problems in Organic Fruit-Growing, Fördergemeinschaft Ökologischer Obstbau e. V. Weinsberg, (12), 172-177)*

→ see rating table at the end

• **Mechanical thinning & other (low impact on residues)**

e.g. (Kelderer M., Lardschneider E. und Casera C. (2009). *Das Ausdünnungsgerät, eine Alternative für die Ertragsregulierung. Obstbau Weinbau, Ausdünnung spezial, 46 (2), 74-76)*

→ see rating table at the end

• **Functional biodiversity (EcoOrchard)**

e.g. (Sigsgaard L., Warlop F., Herz A., Tchamitchian M., Porcel-Vilches M., Pfiffner L., Kelderer M., Jamar L., Kruzynska D., Korsgaard M., Ozolina-Pole L., Ralle B., Penvern S. (2016). *Innovative design and management to boost functional biodiversity of organic orchards. Proceedings of the 17th International Conference on Organic Fruit - Growing from February 15th to February 17th, 2016 University of Hohenheim, Germany, 275-276.)*

e.g. (Fernique S., Penvern S., Cardona A., Ahrenfeld E., Grébeau D., Jamar L., Kruczyńska D., Matray S., Ozolina-Pole L., Ralle B., Sigsgaard L., Steinemann B., Swiergel W., Telfser J., Warlop F., Herz A. (2016). *Organic farmers' reality to manage functional agrobiodiversity in European organic apple orchards. Proceedings of the 17th International Conference on Organic Fruit - Growing from February 15th to February 17th, 2016 University of Hohenheim, Germany, 268-269.)*

→ see rating table at the end

- Resistant & Robust varieties**

e.g. (Guerra W. (2012). *Projekt Resistente Sorten Südtirol. VIP Blick Nr.1, S. 16-17*) → see rating table at the end

Rating table: techniques with more or less relevant residues in South Tyrol

Techniques	IP	Organic
Mating Disruption	<i>Cydia pomonella</i>	<i>Cydia pomonella</i> , <i>Cydia molesta</i> <i>Adoxophyes orana</i> <i>Zeuzera pyrina</i>
Alternative PPP	Low Copper Sulphur <i>Beauveria brongniartii</i>	Low Copper (3 kg met Cu/ kg) Lime sulphur <i>Beauveria brongniartii</i> Carbonates Acid clays CpGV AoGV <i>Bacillus thuringiensis</i> <i>Steinernema feltiae</i> , <i>Steinernema carpocapsae</i>
Net	<i>Melolontha melolontha</i> (apples) <i>Drosophila suzukii</i> (cherries) <i>Rhagoletis cerasi</i> (cherries)	<i>Melolontha melolontha</i> (apples) <i>Drosophila suzukii</i> (cherries) <i>Rhagoletis cerasi</i> (cherries) <i>Cydia pomonella</i> (experimental)
Coverage	Only cherries	Only cherries; apples experimental
Hot water	No	Yes (experimental)
Physical Barrier	No	Yes (nets, hedges)
Alternative Herbicides	Experimental stage	Yes
Mechanical Thinning	Yes (experimental stage)	Yes
Functional Biodiversity	No (toxic to bees!!!)	Yes
Alternative Mulch	Yes (toxic to bees!!!)	Yes
Resistant & robust varieties	Yes 2%	Yes 5%