

Drosophila suzukii in Swiss plum production – Data from a survey on risk management strategies in 2016

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Evaluation of the damage caused by the spotted-wing fly (*Drosophila suzukii*) on plums (Harvest 2016)

Introduction

Dear plum growers,

In 2015, Agroscope in collaboration with the cantonal services sent a survey to stone fruit growers concerning the spotted-wing fly. The survey provided important insights for research, extension services and agricultural practices. The survey is now repeated for the harvest 2016. Its objectives are to evaluate the losses caused by spotted-wing fly and the different measures taken in practice. If your plums are not affected by the spotted-wing fly, please note that your participation in this survey is of great importance to have representative and conclusive results.

Below you will find questions about the following areas:

- Varieties of plums and surfaces
- Assessment of damage
- Measures taken against the insect
- Operational information
- Operations Manager Information

The survey takes about 25 minutes.

Naturally, your information will be treated confidentially and all data will be anonymous.

To thank you for your participation, you will receive, if you wish, an individual evaluation of the results. In addition, we invite you to participate in the draw of 4 SBB vouchers worth CHF 50 each.

We thank you in advance for your cooperation and we invite you to contact us for any additional information!

Esther Bravin (Agroscope), Ladina Knapp (ETH Zürich)

If you have any questions, please contact:

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The survey ends on 19.03.2017.

Q0a. Would you like to receive the results of the survey? We'll send you an individual evaluation. If you're interested in this, please submit your E-Mail address below*¹.

- Yes
- No

Q0b. Would you like to participate in the lottery of 4 SBB vouchers valued at CHF 50 each? If yes, please submit your E-Mail address below*.

- Yes
- No

Q0c. If yes, please let us know your E-Mail address:.....

¹ *Mandatory questions

Plum varieties and stock

Q1. Which plum varieties do you have on your farm? Please only submit the varieties with a cultivated area equal or bigger than 100 square meters (approx. 1000 square feet/0.4 acres) or more than 10 trees (the latter only in the case of standard trees).*

- Cacaks Fruchtbare
- Cacaks Schöne
- Dabrovice
- Elena
- Fellenberg
- Felsina
- Frühe Fellenberg
- Jojo
- Hanita
- Hanka
- Katinka
- Tegera
- Tophit
- Other:.....

Q2a. Please indicate the tree form in your plum orchard:*

Varieties	Low Stem	High stem
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>

Q2b. Please indicate the area of your plum orchard per plum variety (low stem)*:

Please only mention areas that are bigger or equal to 1 Are

Varieties	

Q2c. Please indicate the number of trees per plum variety (high stem):*

Please only mention areas that contain more than 10 high stem trees

Varieties	

Estimation of infestation

Q3a. What was the infested percentage per variety at the harvest? Did you abort the harvest?*

Varieties	0%	1 to 19%	20 to 39%	40 to 59%	60 to 79%	≥ 80%	Abortion of harvest
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q3b. From when did you abort the harvest? How large was the percentage of infestation?

(Only the varieties where "Abortion of harvest" was clicked in Q3a appear)

Varieties	% infestation

Q4. How did the infestation by the spotted-wing drosophila manifest?

- Attested egg deposition (oviposition)
- Attested larvae/pupae
- Puncture holes
- Dripping fruits
- Acetic acid smell
- I don't know
- I did not notice
- No infestation
- Other:

Q5a. Did you sort the plums after the harvest normally?

Varieties	Normal sorting of harvest	Harvest sorted due to the spotted-wing drosophila
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>

Q5b. How much more time (in percent) did you need to sort the plums due to the spotted-wing drosophila? *(This question only appears if in Q5a the option "Harvest sorted due to the spotted-wing drosophila was chosen")*

Varieties	

Q6. Was the plum quality upon delivery in the year 2016 subject to complaints due to infestation with spotted-wing drosophila?

Varieties	Yes	No
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>

Measures against infestation

Q7. Which strategies against the spotted-wing drosophila did you choose for each plum variety? *
(Multiple answers possible)

Varieties	Hygiene measures at harvest	Control for infestation	Installation of nets (weather- & insect nets)	Mass collection in traps	Insecticides	Early harvest	Other	None
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q7other. Which other measures did you use per variety? *(This question only appears if „other“ option is ticked in Q7)*

Q8. How high do you estimate the additional costs (in percent) per kilogram yield that have arisen from to the measures against the spotted-wing drosophila?

- 0% 1-19% 20-39% 40-59% 60-79% ≥ 80%

Q9. Which hygiene measurements did you take? * *(This question only appears if „hygiene measures“ option is ticked in Q7)*

- Keeping the herbaceous layer short/low
- Early harvest
- Clean harvest per variety (no residual fruits)
- Harvest residue removed from the orchard
- Harvest residue mulched
- Post-harvest treatment

Q10. Which post-harvest treatment did you use? * *(This question only appears if post-harvest treatment option is ticked in Q7)*

Q11. How did you check for infestation? * (Multiple answers possible) *(This question only appears if control for infestation is ticked in Q7)*

- Visual control
- Salt test
- Soap-/warm-water control

- Controlling of infestation via cantonal services
- Traps
- Other:.....

Q12. What is the concept of weather and insect net protection for your installation? *(This question only appears if nets measures is ticked in Q7)*

Varieties	Hail protection	Bird protection	Lateral insect nets	Netting of tree crown	Netting at the tractor entrance
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q13. What is the mesh size of your nets? (Multiple answers possible)

(This question only appears if nets measure is ticked in Q7)

- 0.4 to 0.8 mm (incl. 0.8 x 0.8 mm)
- 0.8 to 1.3 mm (incl. 1.3 x 1.3 mm)
- 1.3 to 1.7 mm (incl. 1.7. x 1.7 mm)
- Other:.....

Q14. Use of insecticides: Which substances did you use against the spotted-wing drosophila and how often per year? Please indicate the number of treatments in the field on the right hand side.*
(Multiple answers possible)

This question only appears if Insecticides was ticked in q7.

Insecticides	Number of treatments
<input type="checkbox"/> Thiachlopid (e.g. Alanto*)	
<input type="checkbox"/> Spinosad (e.g. Audienz*)	
<input type="checkbox"/> Acetamiprid (e.g. Gazelle SG*)	
<input type="checkbox"/> Pyrethrine (e.g. Parexan N* or Pyrethrum*)	
<input type="checkbox"/> Other:.....	

**or other commercial products with a similar active substance*

Q14b. Was Thiachlopid used against the plum tortrix? *(Question only appears if in question 14 Thiachlopid ticked)*

- Yes
- No

Q15. How satisfied are you with your chosen strategies per variety? (1=very unsatisfied, 5=very satisfied)

Varieties	1 (very unsatisfied)	2	3	4	5 (very satisfied)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Q16. If you weren't satisfied, what would you do differently in the future? (*Question only appears if values in question 15 are 3,2 or 1*)

Q17. How will you minimize the infestation with spotted-wing drosophila in the future? (Multiple answers possible)

- Clearing of susceptible varieties
- Insecticides
- Lateral nets
- Full netting of trees
- Traps
- Kaolin
- Slaked lime
- Increased hygiene measurements
- Earlier harvesting
- Post-harvest treatments
- No measures necessary
- Other:.....

Q18. Where do you get your expertise about the spotted-wing drosophila? (Multiple answers possible)

- Leaflets and information from Agroscope
- Leaflets and information from the cantonal specialist units
- Breitenhof conferences
- Cantonal orcharding meetings
- Specialist articles/journals
- Plant protection news for fruit and vine cultivation
- AGRIDEA
- Internet
- Other producers
- Private sector (buyers, suppliers)
- Consulting from plant protection firms
- Other:.....

Q19a. Are there any of the following elements in a 100m radius around your installations?

- Edge of the forest
- Hedges
- Waters
- Cultivated standard fruit trees
- Uncultivated standard fruit trees
- Compost heap
- Fruit- or berry production
- House garden
- Building

- Host plants (e.g. elder shrubs, blackberries, wild cherries)
- Flower strips for pollinators and other beneficial insects
- Fallows
- Seams on arable land
- Native, suited single trees and alleys
- Vineyards
- Other:.....

Q19b. How do the elements from above influence the infestation with spotted-wing drosophila in your opinion? *(In this question only the elements ticked in Q19 will appear)*

Elements	No influence	More infestation	Less infestation	I don't know
Edge of the forest	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Hedges	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Waters	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cultivated standard fruit trees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Uncultivated standard fruit trees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Compost heap	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fruit- or berry production	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
House garden	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Building	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Host plants (e.g. elder shrubs, blackberries, wild cherries)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Flower strips for pollinators and other beneficial insects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fallows	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Seams on arable land	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Native, suited single trees and alleys	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vineyards	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q20. Do you have special findings regarding the spotted-wing drosophila?

Information about the farm

Q21. To link your infestation with the weather data from your region, please fill in your post code below*:

Q22. What is the focus of your farm? (You can only chose one focus of production.)

- Plum production
- Orcharding and viticulture
- Stone fruit production (cherries/plums/apricots)
- Pome production (apples/pears)
- Pome and stone fruit production
- Mixed Farm: fruit growing and livestock farming
- Other:.....

Q22b. Please specify: (*Question only appears if in Q22 it was ticked pome and stone fruit production*)

- Stone fruit production (cherries/plums/apricots)
- Pome production (apples/pears)

Q23. According to which production form do you manage your farm?

- ÖLN/Suisse Garantie
- Organic farming
- Conventional
- Others

Q24. How many units of standard manpower does your farm have?

Q25. What's your total farmland in Aren?

Q26. Which share of your farmland are you leasing?

- 0-25% 26-50% 51-75% 76-100%

Q27. How are you marketing your plums? Please provide us the percentage for each marketing option chosen.

- Sales to commerce, collection point:%
- Sale directly to major distributors:%
- Direct marketing:%
- Other

Q27other. Please specify which other marketing options you mean.

Q28. Do you have a hail insurance?

- Yes
- No

Q28a. Which hail insurance do you have? Please only select one answer.

- I have the hail insurance "standard" (Swiss Hail)
- I have the hail insurance "enhanced" (Swiss Hail)
- I have the hail insurance "Fix" (Swiss Hail)

Q29. Which of the following strategies are you employing on your farm?

- Agriculture-related diversification (e.g. agrotourism)
- Working off-farm (e.g. consulting, tourism)
- Creation of financial reserves (saving for bad times)
- Off-farm investments (e.g. other companies, real estate)
- Processing and direct marketing
- Forestry work
- Other strategies:.....

	a risk at all 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/>
Agriculture in general	not willing to take a risk at all 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/>

Concluding questions

Q38. Do you have any closing comments?

Thank you for your participation. We will treat your personal data as strictly confidential. If you have any questions or comments, please contact:

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If you left us your e-mail address and asked for an individual feedback, we will send you an individual feedback. If you are the lucky winner of the draw, we will notify you of course.

You can now close the Internet browser.