

Drosophila suzukii in Swiss grape production- Data from a survey on risk management strategies in 2016

Dataset**Author(s):**

Knapp, Ladina; Bravin, Esther; Meraner, Manuela; [Finger, Robert](#) 

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

Dear Producers,

In 2015, Agroscope in collaboration with the cantonal services sent a survey to producers 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 grapes 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 grapes 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:

Ladina Knapp- ETH Zürich

knappl@ethz.ch

The survey ends on 28.02.2017.

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

Grape varieties

Q1. Which grape varieties do you have on your vineyard? Please only mention the varieties with a cultivated area over or equal to 100 square meters (1000 square feet/0.4 acres) *.

- Amigne
- Petite arvine
- Pinot noir
- Cabernet sauvignon
- Cabernet dorsa
- Carminoir
- Chardonnay
- Chasselas
- Cornalin
- Diolinoir
- Divico
- Dornfelder
- Dunkelfelder
- Gamay
- Gamaret
- Garanoir
- Gewürztraminer
- Pinot gris
- Humagne rouge
- Humagne blanche
- Mara
- Merlot
- Müller-Thurgau
- Regent
- Sauvignon blanc
- Sylvaner
- Syrah/Shiraz
- Viognier
- Pinot blanc
- Zweigelt
- Other

Q2a. Please indicate the sort of vine training system per variety*.

Varieties	Wired vine training (Guyot, Cordon, ...)	Gobelet	Pergola
	<input type="checkbox"/>	<input type="checkbox"/>	
	<input type="checkbox"/>	<input type="checkbox"/>	

Q2b. Please indicate the cultivated area per variety (only mention areas that are bigger or equal 100 square meters) *.

Varieties	Surface

Estimation of infestation

Q3a. Which percentage of the yield per variety was infested with acetic acid rot? Did you have to abort the harvest*?

	No acetic rot	Up to 5% acetic acid rot	Between 5% and 12.5% acetic acid rot	Between 12.5% and 25% acetic acid rot	Between 25 % and 50% acetic acid rot	Between 50% and 75% acetic acid rot	Over 75% acetic acid rot	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 high was the percentage of acetic acid rot at this point?

Varieties	%Infestation

Q3c. How high (in percent) was the infestation by spotted-wing drosophila per grape variety in 2016? Did you abort the harvest*?

	No infestation	Up to 5%	Between 5% and 12.5%	Between 12.5% and 25%	Between 25 % and 50%	Between 50% and 75%	Over 75%	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"/>	

Q3d. From when did you abort the harvest? How high (in percent) was the infestation by spotted-wing drosophila at this point?

Varieties	% Infestation

Q4. How did the infestation of 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 vines after the harvest normally?

Varieties	Harvest by machine	Harvest sorted normally	Harvest sorted due to the spotted-wing drosophila
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q5a How much more time (in percent) did you need to sort the vines due to the spotted-wing drosophila?

Varieties	%

Q6. Was the grape 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 vine variety? *

Varieties	Preventive measures	Control of infestation	Installation of nets	Mass collection of flies with traps	Insecticides	Early harvest	None of these strategies used	Other
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q7 other. Which other measures did you take per vine variety?

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

- 0%
 1-19%
 20-39%
 40-59%
 60-79%
 ≥ 80%

Q9. Which preventative measures did you take?

- Pinching back of foliage

- Yield regulation before color change
- No spreading of pomace near non-harvested parcels
- Mowing/mulching
- Early harvest
- Clean harvest of every fruit (no residual fruits)
- Harvest residue removed from the vineyard
- Harvest residue mulched
- Post-harvest treatment
- Other

Q10. Which post-harvest treatment did you undertake?

Q11. How did you control the infestation?

- Visual control
- Control of the oviposition with binoculars
- Control through specialist units
- Traps
- Salt-test, soap-/warm-water control
- Other

Q12. What's the concept of weather and insect net protection for your installation?

Varieties	Hail protection	Bird protection	Lateral insect nets	Netting of specific rows with insect nets	Netting of multiple rows with insect nets
	<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's the mesh size of your nets?

- Insect net (<1.2mm)
- Close-meshed bird net (3.5mm-8mm)
- Hail net (3mm-9mm)
- Wide-meshed bird net (3cm-5cm)
- For bigger mesh sizes, please indicate the mesh size below :....

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.

Insecticides	Number of treatments per year
<input type="checkbox"/> Kaolin (e.g. Surround)	
<input type="checkbox"/> Spinosad (e.g. Audienz*)	
<input type="checkbox"/> Acetamiprid (e.g. Gazelle SG*)	
<input type="checkbox"/> Pyrethrin e.g. Parexan N* or Pyrethrum*)	
<input type="checkbox"/> other :	

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

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"/>

Q16. If you weren't satisfied, what would you do differently in the future?

Q17. How will you minimize the infestation with spotted-wing drosophila in the future?

- Clearing of susceptible varieties
- Insecticides
- Nets
- Traps
- Kaolin
- Slaked lime
- Pinching back of foliage
- No measures necessary
- Other

Q18. Where do you get your expertise about the spotted-wing drosophila?

- Leaflets and information from Agroscope
- Leaflets and information from the cantonal specialist units
- 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
- Others (e.g. special symposiums)

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

- Edge of the forest
- Hedges
- Waters
- Cultivated high-trunk fruit trees
- Uncultivated high-trunk 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
- Others

Q19b. How do the elements from above influence the infestation with spotted-wing drosophila in your opinion?

	Kein Einfluss	Mehr Befall	Weniger Befall	Weiss ich nicht
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 high-trunk fruits trees	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Uncultivated high-trunk 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"/>
Others	<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's the focus of your farm? (You can only chose one focus of production.)

- Viticulture
- Orchardng and viticulture
- Stone fruit production (cherries/plums/apricots)
- Pome production (apples/pears)
- Pome and stone fruit production
- Mixed Farm; viticulture and livestock farming
- Others

Q22b. Please specify:

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

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

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

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

Q25. What's your total farmland in 100's of square meters?

Q26. Which share of your farmland are you leasing?

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

Q27. How are you marketing your vines (in percent)?

- As grapes

Sale	Percentage
Sales to winemakers	
Sales to cooperatives	
Sales to commerce	
Other: <input style="width: 150px;" type="text"/>	

- As wine

Sale	Percentage
Direct marketing	
Sales to commerce	
Sales to major distributors	
Sales to gastronomy	
Other: <input style="width: 150px;" type="text"/>	

Q28. Do you have a hail insurance?

- Yes
- No

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

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

Information about the farm manager

Q30. How high is your expected yield loss caused by the spotted-wing drosophila?

- 0% 1-25% 26-50 % 51 - 75 % 76 – 100%

Q31. How much additional cost (in percent) do you expect in the coming year for the different measures you will take against the spotted-wing drosophila?

- 0% 1-25% 26-50 % 51 - 75 % 76 – 100%

Q32. Which percentage of your earnings are from farming?

- 0% 1-25% 26-50 % 51 - 75 % 76 – 100%

Q33. How much is the viticulture contributing to your earnings (in percent)?

- 0% 1-25% 26-50 % 51 - 75 % 76 – 100%

Q34. Your sex

- Female
 Male

Q35. In which year are you born?

Q36. Do you have a successor to your farm?

- Yes
- Rather yes
- Rather no
- No
- No, there's no farm succession in the next 15 years
- No, the farm will be discontinued

Q37. Are you willing to take risks or do you try to mitigate risks in the areas mentioned below? *

Please indicate on the scale below. The value of 0 stands for "not willing to take a risk at all" and the value 10 for "very willing to take a risk". With the values in between you can grade your assessment.

Production	not willing											very willing
	0	1	2	3	4	5	6	7	8	9	10	
	<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"/>
Market and prices	not willing											very willing
	0	1	2	3	4	5	6	7	8	9	10	
	<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"/>
External financing	not willing											very willing
	0	1	2	3	4	5	6	7	8	9	10	
	<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"/>
Agriculture in general	very willing											very willing
	0	1	2	3	4	5	6	7	8	9	10	
	<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"/>

Concluding questions

Q38. Do you have any comments?

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

Ladina Knapp, ETH Zurich
 Agricultural Economics and Agricultural policy Group
knappl@ethz.ch

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.