

# Drosophila suzukii in Swiss berry production – Data from a survey on risk management strategies in 2017

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## Evaluation of the damage caused by the spotted-wing drosophila (*Drosophila suzukii*) on berries (Harvest 2017)

Dear Producers,

In 2016, Agroscope in collaboration with the cantonal services sent a survey to producers concerning the spotted-wing drosophila. The survey provided important insights for research, extension services and agricultural practices. The survey is now repeated for the harvest 2017. Its objectives are to evaluate the losses caused by spotted-wing drosophila and the different measures taken in practice. If your berries are not affected by the spotted-wing drosophila, 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 berries and surfaces
- Assessment of damage
- Measures taken against the insect
- Operational information
- Operations Manager Information

Some questions are not directly linked to the spotted-wing drosophila (e.g. operational information). Nevertheless, these questions are also important to evaluate the survey. Naturally, your information will be treated confidentially and all data will be anonymous.

The survey takes **about 25 minutes**.

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 LANDI vouchers worth CHF 50** each.

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

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

If you have any questions, please contact:

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## Varieties of berries and surfaces

q01: Which berry varieties do you have on your farm? Please only mention the varieties with a cultivated area **over or equal to 100 square meters** (1 Are).

- ☐ Fall Raspberries
- ☐ Autumn Raspberries
- ☐ Blackberries
- ☐ Blueberries
- ☐ Elderberries
- ☐ Strawberries (bearing once or blooming a second time varieties)
- ☐ Aronia
- ☐ Mini Kiwi
- ☐ Others:

q01a: Please indicate the cultivated area of other berries.

q02a: Please indicate the varieties and cultivated area of the Fall Raspberries:

Varieties	Surface (Are)
<input type="checkbox"/> Tulameen	
<input type="checkbox"/> Elida	
<input type="checkbox"/> Glen Ample	
<input type="checkbox"/> Malahat	
<input type="checkbox"/> Meeker	
<input type="checkbox"/> Willamette	
<input type="checkbox"/> Other varieties: .....	

q02b: Please indicate the varieties and cultivated area of the Autumn Raspberries:

Varieties	Surface (Are)
<input type="checkbox"/> Amira	
<input type="checkbox"/> Autumn Bliss	
<input type="checkbox"/> Himbo Top	
<input type="checkbox"/> Heritage	
<input type="checkbox"/> Kwanza	
<input type="checkbox"/> Polka	
<input type="checkbox"/> Versailles	
<input type="checkbox"/> Other varieties: .....	

q02c: Please indicate the varieties and cultivated area of the Blackberries:

Varieties	Surface (Are)
<input type="checkbox"/> Chester	
<input type="checkbox"/> Loch Ness	
<input type="checkbox"/> Loch Tay	
<input type="checkbox"/> Navaho	
<input type="checkbox"/> Other varieties: .....	

q02d: Please indicate the varieties and cultivated area of the Blueberries:

Varieties	Surface (Are)
<input type="checkbox"/> Berkeley	
<input type="checkbox"/> Bluecrop	
<input type="checkbox"/> Coville	
<input type="checkbox"/> Duke	
<input type="checkbox"/> Liberty	
<input type="checkbox"/> Other varieties: .....	

q02e: Please indicate the varieties and cultivated area of the Elderberries:

Varieties	Surface (Are)
<input type="checkbox"/> Haschberg	
<input type="checkbox"/> Other varieties: .....	

q02f: Please indicate the varieties and cultivated area of the Strawberries (bearing once and blooming a second time varieties):

Varieties	Surface (Are)
<input type="checkbox"/> Clery	
<input type="checkbox"/> Darselect	
<input type="checkbox"/> Elsanta	
<input type="checkbox"/> Joly	
<input type="checkbox"/> Sonata	
<input type="checkbox"/> Capri	
<input type="checkbox"/> Eve Delight	
<input type="checkbox"/> Everest	
<input type="checkbox"/> Murano	
<input type="checkbox"/> Vivara	
<input type="checkbox"/> Mara des Bois	
<input type="checkbox"/> Other varieties: .....	

q02g: Please indicate the cultivated area of Aronia berries:

q02h: Please indicate the cultivated area of Mini Kiwi:

## Assessment of damage

q03: How high (in percent) was the infestation by spotted-wing drosophila per berry type in 2017?

<i>(Varieties from q01)</i>	0%	1-5%	6 -10%	11 -15%	16 -20%	21- 25%	26-30%	>30%
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

q03a: Did you abort the harvest?

<i>(Varieties from q01)</i>	
	<input type="checkbox"/> yes <input type="checkbox"/> no

q04: How did the infestation of the spotted-wing drosophila manifest?

- ☐ Attested oviposition
- ☐ Attested larvae/pupae
- ☐ Puncture holes
- ☐ Dripping fruits
- ☐ Acetic acid smell
- ☐ I don't know.

q05: How much more time (in percent) did you need to sort the cherries due to the spotted-wing drosophila?

<i>(Varieties from q01)</i>	<i>More time in %</i>

q06: Was the berry quality upon delivery in the year 2017 subject to complaints due to infestation with spotted-wing drosophila?

<i>(Varieties from q01)</i>	yes	partially	no
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Measures taken against the insect

q07: Which strategies against the spotted-wing drosophila did you choose for each berry type?

(Varieties from q01)	Hygiene measurements	check for infestation	Installation of nets	Mass collection in traps	Insecticides
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(Varieties from q01)	Short interval harvest	Lime application	Others	None	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

q07a: Which other measures did you take per berry variety?

(Varieties from q01)	Other measures

q08: Which hygiene measurements did you take?

- ☐ Short interval harvest
- ☐ Clean harvest per variety (no residual fruits)
- ☐ Harvest residue removed from field
- ☐ Abortion of harvest and direct control of infestation
- ☐ Others:

q09: How did you control the infestation?

- ☐ Visual control
- ☐ Salt test
- ☐ Soap- / warm-water control
- ☐ Control through specialist units
- ☐ Traps
- ☐ Freezing of fruits
- ☐ Others:

q10: What is the concept of weather and insect net protection for your installation?

(Varieties from q01)	Hail protection	Bird protection	Insect protection	Netting of tree crown	Wind protection
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

q11: What is the mesh size of your nets?

☐ 0.4 bis 0.8 mm (inkl. 0.8 x 0.8 mm)

☐ 0.8 bis 1.3 mm (inkl. 1.3 x 1.3 mm)

☐ 1.3 bis 1.7 mm (inkl. 1.7 x 1.7 mm)

☐ or bigger mesh sizes, please indicate the mesh size:

q12: 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.

Insecticide/Facility	Number of treatments per year
<input type="checkbox"/> Thiacloprid (e.g. Alanto)	
<input type="checkbox"/> Spinosad (e.g. Audienz)	
<input type="checkbox"/> Lime	
<input type="checkbox"/> Others: .....	

q13: How high do you estimate the additional costs (in percent) per kilogram yield that have arisen from the measures against the spotted-wing drosophila for the harvest 2017?

☐ 0%

☐ 1-5%

☐ 6-10%

☐ 11-15%

☐ 16-20%

☐ 21-25%

☐ 26-30%

☐ >30%

q14: How satisfied are you with your chosen strategies per berry type?

<i>(Varieties from q01)</i>	1 (very unsatisfied;)	2	3	4	5 (very satisfied)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

q15: If you were not satisfied, what would you do differently in the future?

q16: How will you minimize the infestation with spotted-wing drosophila in the future?

- ☐ Insecticides
- ☐ Lateral nets
- ☐ Full netting of trees
- ☐ Trips
- ☐ Slaked lime
- ☐ Increased hygiene measurements
- ☐ Short harvest intervals
- ☐ No measures necessary
- ☐ Others:

q17: Where do you get your expertise about the spotted-wing drosophila?

- ☐ Leaflets and Information from Agroscope
- ☐ Leaflets and Information from the cantonal specialist units
- ☐ Info days of Agroscope for producers
- ☐ Cantonal consulting service
- ☐ Specialist articles/journals
- ☐ Newsletter of the TaskForce and Swiss Berry Note
- ☐ Internet research
- ☐ Other producers
- ☐ Private Sector (purchaser/suppliers)
- ☐ Consulting from plant protection firms
- ☐ Information of Swiss Fruit Associations
- ☐ Others (z.B. specialist conference):

q18: Are there any of the following elements in a 100m radius around your installations?

Element present	
<input type="checkbox"/>	Edge of the forest
<input type="checkbox"/>	Hedges
<input type="checkbox"/>	Waters
<input type="checkbox"/>	Cultivated standard fruit trees
<input type="checkbox"/>	Uncultivated standard fruit trees
<input type="checkbox"/>	Compost heap
<input type="checkbox"/>	Fruit- or berry production
<input type="checkbox"/>	House garden
<input type="checkbox"/>	Building
<input type="checkbox"/>	Host plants (e.g. elder shrubs, blackberries, wild cherries)
<input type="checkbox"/>	Vineyards
<input type="checkbox"/>	Flower strips for pollinators and other beneficial insects
<input type="checkbox"/>	Fallows



<input type="checkbox"/>	Seams on arable land
<input type="checkbox"/>	Native, suited single trees and alleys
<input type="checkbox"/>	Others: .....

q18a: How do the elements from above influence the infestation with spotted-wing drosophila in your opinion?

	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"/>
vineyards	<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"/>

q19: Do you have special findings regarding the spotted-wing drosophila?

## Operational and operation's manager information

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q20: To link your infestation with the weather data from your region, please fill in your post code below:

Please indicate the post code of the site where most of your berry production is located.

q21: How high is your expected yield loss (for the harvest 2018) caused by the spotted-wing drosophila?

- ☐ 0%
- ☐ 1-5%
- ☐ 6-10%
- ☐ 11-15%
- ☐ 16-20%
- ☐ 21-25%
- ☐ 26-30%
- ☐ >30%

q22: How much additional cost (in percent) do you expect in the coming year (2018) for the different measures you will take against the spotted-wing drosophila?

- ☐ 0%
- ☐ 1-5%
- ☐ 6-10%
- ☐ 11-15%
- ☐ 16-20%
- ☐ 21-25%
- ☐ 26-30%
- ☐ >30%

q23: What is the focus of your farm? (You can only choose one focus)

- ☐ Berry production
- ☐ Orchard and viticulture
- ☐ Stone fruit production (cherries/plums/apricots) and berry production
- ☐ Pome production (apples/pears) and berry production
- ☐ Pome, stone fruit production and berry production
- ☐ Mixed farm - fruit growing and livestock farming
- ☐ Others:

q23a: Please specify:

- ☐ Stone fruit (cherries/plums/apricots) and berry production
- ☐ Pome production (apples / pears) and berry production
- ☐ Berry production

q24: Do you manage your farm according to organic farming guidelines?

- ☐ Yes
- ☐ No

q25: How many units of standard labor does your farm have?

q26: What is your total farmland in Are?

q27: Which share of your farmland are you leasing?

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

q28: How are you marketing your berries (in percent)?

Channel	%
Commerce	<input type="text"/>
Large distributor	<input type="text"/>
Direct selling	<input type="text"/>
Others: .....	<input type="text"/>

q28a: Which other marketing channels do you have?

q29: Do you have a hail insurance?

- ☐ Yes
- ☐ No

q29a: Which hail insurance do you have?

- ☐ I have the hail insurance «Standard» (Schweizer Hagel)
- ☐ I have the hail insurance «Erhöht» (Schweizer Hagel)
- ☐ I have the hail insurance «Fix» (Schweizer Hagel)

Q30: Which of the following strategies are you employing on your farm?

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

q31: Which percentage of your earnings originate from farming?

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

q32: How much is the cherries production contributing to your earnings (in percent)?

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

q33: Your gender?

- ☐ Female
- ☐ Male

q34: In which year are you born?

q35: Do you have a successor to your farm?

- ☐ Yes
- ☐ No

q36: Are you willing to take risks or do you try to mitigate risks in the areas mentioned below?

*Please only tick one box per line, where 0 represents "not willing to take a risk at all" and 10 "very willing to take a risk". With the values in between you can grade your assessment.*

	0 not willing to take a risk at all	1	2	3	4	5	6	7	8	9	10 very willing to take a risk
Production											
Market and prices											
external financing											
agriculture in general											

## Final questions

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q37: Would you like to receive the results of the survey? We would send you an individual evaluation.

☐ Yes

☐ No

q38: Would you like to participate in the lottery of 4 LANDI vouchers valued at CHF 50 each?

☐ Yes

☐ No

q39: Please let us know your E-Mail address:

q40: 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:

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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 close the internet browser now.