Use of toxic baits for the control of *Drosophila suzukii*

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Use of toxic baits for the control of *Drosophila suzukii*

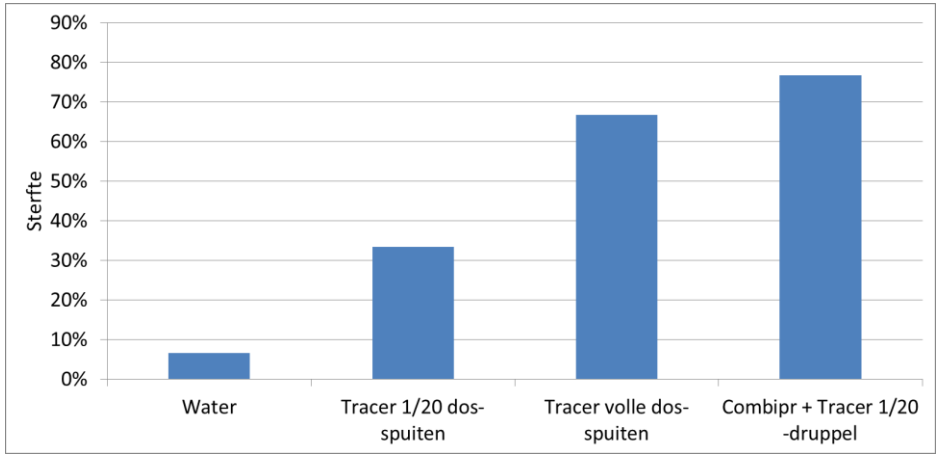
Toxic baits

- "a food containing a poison"
- The food improves the uptake of the poison -> higher efficacy with less poison
- In insect control:
    - control of Tephretid fruit flies, mainly in the tropics
    - Species of which the adults search for food
    - The insect has to find the bait
- Adult *D. suzukii*
    - Need proteins and carbohydrates
    - Actively search on plants for food

Use of toxic baits for the control of *Drosophila suzukii*

- Combiprotec (Dedetec, Germany) has a registration as an additive in NL
- Mixture of proteins, yeast, sugars
- -> used as a model in this work
- Use in practice: 1-2 l Combiprotec with low dose insecticide in 20 l/ha, coarse droplet.
- Field experiments in Germany show variable results
- Effects on adults difficult to show in field experiments -> cages

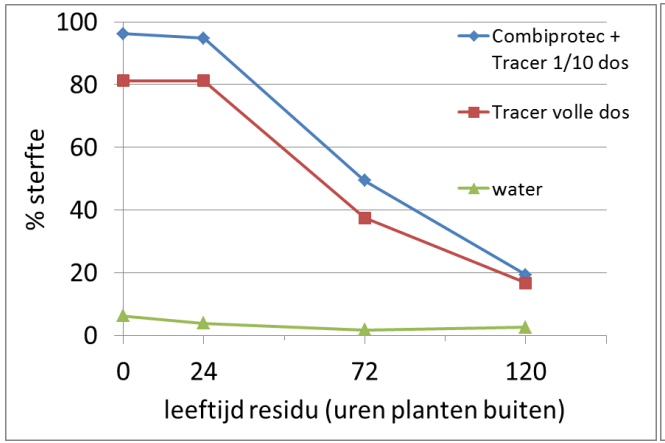
Efficacy of Combiprotec + spinosad (Tracer) in the lab



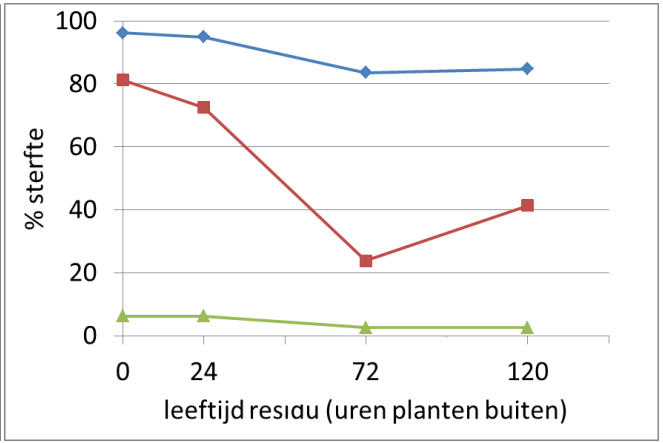
Mortality of adult *D. suzukii* after 24 h in cages with treated strawberry plants.

Residue aging and efficacy

Plants kept in the field after spraying



Plants kept under plastic cover (outdoors)



- Spinosad (Tracer) rapid decline of residue when sprayed alone
- Without cover Combiprotec/Tracer rapid decline (sun, some rain)
- Much longer residual effect when protected

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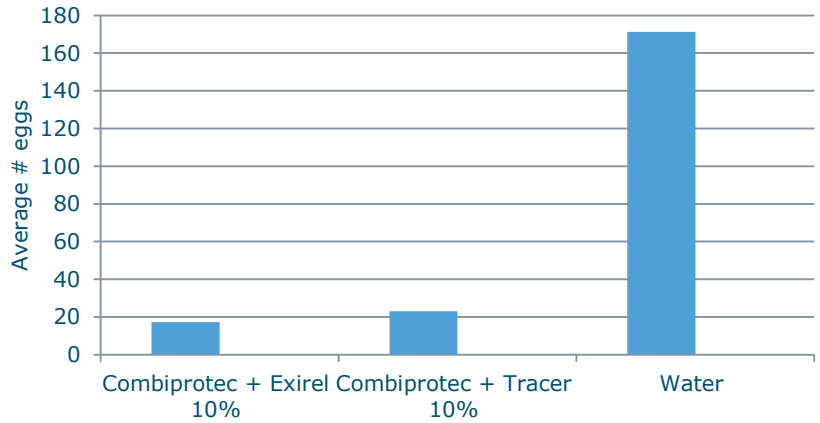
Semi-field experiments



Average number of eggs in fruits per cage after one week, in cages with raspberry plants.

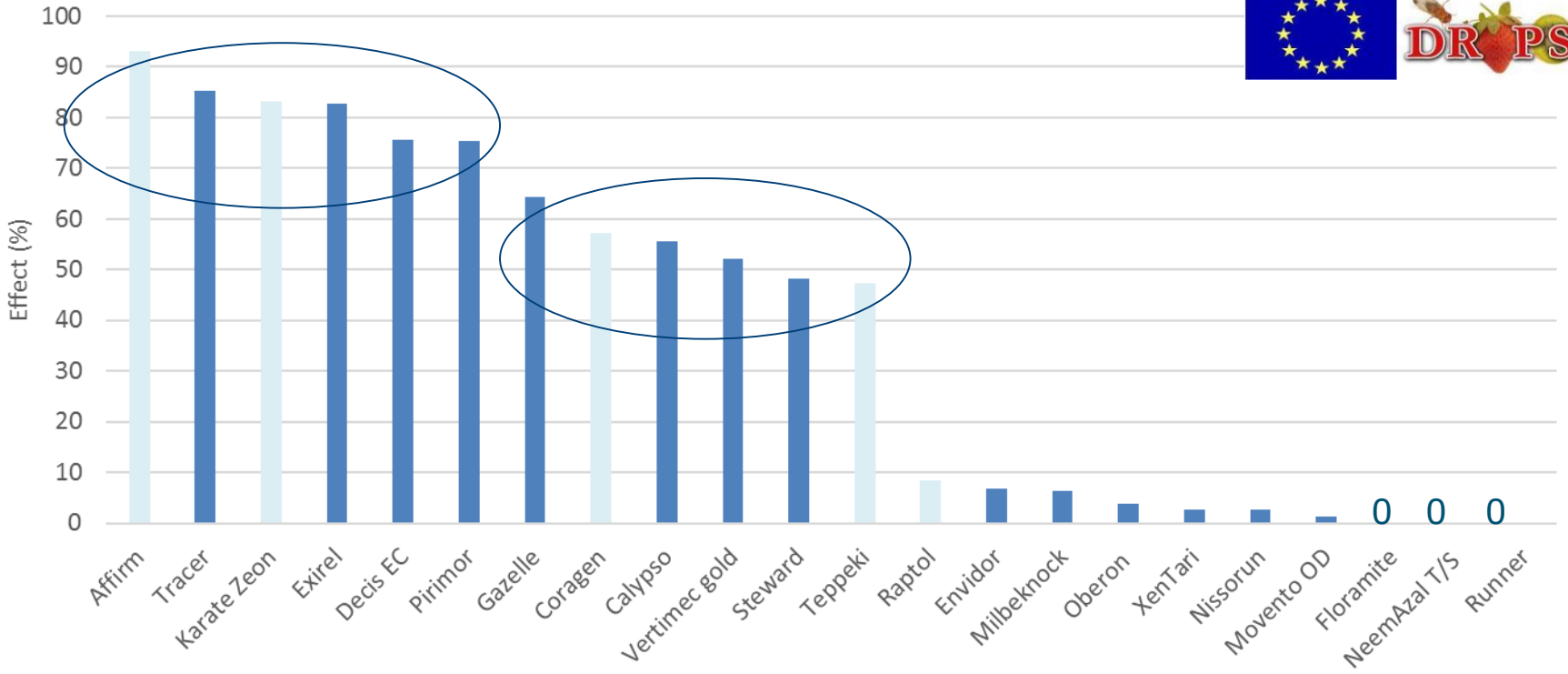
Limitations spinosad (Tracer):

- Rapid decline of spinosad residue
- Strong dependence on one active ingredient; restricted use; maximum two applications per growing cycle in NL.
- -> What is the efficacy of other insecticides in combination with bait?

  -> Large number of experiments on strawberry plants in cages

  -> comparing insecticides with spinosad as a ‘standard’

  -> we used insecticides at 10% of the recommended field rate



Efficacy of Combiprotec + low doses of insecticides (10% of standard rate) on adult D. suzukii.. Exposure time 48 hours. Averages of several experiments. *(light blue colour = not registered for use in NL soft fruit)*

Registration status of tested compounds in NL (2017)

		effect %	cherry	strawberry	red currant	blackberry	raspberry	blueberry	Effects on pollinators, and/or limited use on flowering crops NL
Affirm	emamectine	93.2	X	X	X	X	X	X	yes
Tracer	spinosad	85.34	V	T	T	T	T	T	yes
Karate Zeon	l.-cyhalothrin	83.3	X	X	X	X	X	X	yes
Exirel	cyantraniliprole	82.7	V	X	X	X	X	V	Yes
Decis EC	deltamethrin	75.5	X	T	T	T	T	X	yes
Pirimor	pirimicarb	75.3	T	T	T	T	T	X	potentially dangerous
Gazelle	acetamiprid	64.4	T	X	X	X	X	X	no
Coragen	chlorantraniliprole	57.3	X	X	X	X	X	X	no
Calypso	thiacloprid	55.6	T	T	T	T	T	T	no
Vertimec gold	abamectine	52.2	T	T	T	T	T	X	yes
Steward	indoxacarb	48.3	T	T	T	T	T	T	potentially dangerous
Teppeki	flonicamid	47.3	X	X	X	X	X	X	yes
Raptol	pyrethrum	8.5	X	X	X	X	X	X	?
Envidor	spirodiclofen	6.7	X	T	X	X	X	X	yes
Milbeknock	milbemectin	6.4	X	T	X	X	X	X	no
Oberon	spiromesifen	3.9	X	T	X	X	X	X	yes
XenTari	B. thuringiensis	2.7	T	T	T	T	T	T	no
Nissorun	hexythiazox	2.6	X	T	X	X	X	X	no
Movento OD	spirotetramat	1.3	T	X	X	T	T	X	yes
Floramite	bifenazaat	0	X	T	T	T	T	X	no
NeemAzal T/S	azadirachtine	0	X	X	X	X	X	X	yes
Runner	methoxyfenozide	0	X	X	X	X	X	X	no

X Not registered in indicated crop
T approved
V 2017 temporary approval

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Discussion and conclusion (1)

- Combiprotec combined with a low dose of insecticide
  - Experiments in confined environment show good and consistent efficacy.
  - The bait strongly increases the adulticidal efficacy of insecticides
  - More active ingredients available for D. suzukii control. Insecticide resistance management.
  - Large droplets, low dose -> less emission
  - In 2017 good results in combination with insect netting on cherry in NL (see poster)

Discussion and conclusion (2)

- Still questions
  - Improvement of baits possible? UV protection, rain fastness?
  - Fresh residue of Combiprotec doesn’t attract flies. Should a lure be added?
  - Optimal droplet size?
  - Where on the crop? Does it have to be applied on the crop?
  - Residual efficacy of various active ingredients in time (and efficacy versus MRL)
  - Potential for combination with organic compounds or microorganisms?
- Based on results so far
  - Optimisation needed
  - Bait sprays show a good potential as a part of an integrated control strategy

Thank you for your attention

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