

**Automating Insect Control with Vision & Bat-like drones** 

2020 Winner Blue Tulip Awards



Check out our demo video on YouTube



## **Problem:** Insect Control in Horticulture is Hard





The Tomato leafminer affects **60%** of the worldwide tomato crop area.

The Diamondback moth is a global agricultural pest that costs **\$4-5** billion annually.



**1. Complex:** Chemical control solutions increasingly regulate EU Green Deal: **50%** reduction of pesticides by **2030** 



**2. Partially effective:** Pest management methods interfere Frequent applications of pesticides increases resistance of pests



3. Time consuming: Keeping on top of pests is laborious
EU agricultural workforce declines with 28% by 2030

## **Solution:** Automated Insect Control with Bat-like Drones







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## Modular Service Model

#### **PATS-C:** Insect Scouting

Click button for demo video PATS-C

Launched November 2020: tens of growers signed up





## **PATS-C:** Autonomous Pest Monitoring



Base station tracks pests & controls drone



**LED-module** illuminates nocturnal pests





## Plug & Play installation

by user – approx. 20 minutes

Installation video

#### ~ 1 system per hectare

#### Pests in scope today:

- Tomato looper
- Duponchelia moth
- Banana moth (opogona)
- Tomato leafminer (tuta absoluta)
- Diamondback moth (cabbage moth)
- Snout moths
- Lyprauta
  - .... new insects are added regularly

# **PATS-C** in the Field



Vegetables: Tomato Radish Lettuce



Fruit: Strawberry

Banana

**Flowers:** Gerbera Rose Chrysanthemum Matricaria

#### Ornamentals:



Phalaenopsis Areca Bromelia Yucca Green plants

Kalanchoe Kentia Pilea Ferns



## **Customer Story: Duponchelia in Strawberry**



This graph visualizes the daily flight activity of adult moths at one of our user locations with pest pressure from Duponchelia moth.

- 1. With PATS-C Duponchelia was already visible in small numbers from day 1 after crop rotation (mid July)
- 2. First adult Duponchelia adults where found in conventional traps on September 10<sup>th</sup> (6 weeks later)
- 3. The daily gathering of adult flight activity shows that pest pressures increases quickly

Click button for videos

## **USP's PATS-C**

#### 1. Fully automated

- Brings relevant data to the grower
- Saves on labour spent on scouting
- Keeps people out of the crops
- Consistent

# 2. High frequency

- Continuous data collection
- Follow trends closely
- Opens up prediction possibilities

# 3. Insights

- Detects pests at first flight (up to 3 weeks earlier!)
- Pest development from day to day
- Peak activity from hour to hour
- Early warning (alerts)







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#### **Quote PATS-C User in Gerbera**



W.P. van den Berg Gerbera United



"With PATS-C we were able to detect Duponchelia moth already in April of this year. At that moment I did not yet catch any adult moth in the UV- and pheromone traps I was using at that moment.

The pest was present much earlier than I expected. These insights and alerts can help me react more timely and adequately on rising pest levels."

### **Quote PATS-C User in Strawberry**

Richard van Dijk Strawberry nursery Hoogsewetering



"Before the crop rotation last July, we were suffering from high Duponchelia moth pest pressure. Before planting the new crop, we decided to clear the greenhouse and perform rigid hygiene measurements. We expected to not see the pest in the greenhouse for a while.

Based on the findings in our conventional traps this assumption was right. But the PATS-C system proved otherwise and registered the flights of adult moths already the first days after the planting. The pest pressure has since steadily risen until today (start of September).

#### **PATS-X:** Autonomous Insect Control





**Base station** tracks pests & controls drone



LED-module illuminates nocturnal pests





**Charging platform** enables 24/7 autonomy



**Microdrone** for pest eradication

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### PATS-X: How it's Done



utton ideo



### **PATS-X: Insect Eradication**





Tomato looper at Koppert Cress (NL)

### PATS-X: Insect control in tomato





Tuta absoluta in tomato at PCH (BE)



Waarnemingen toevoegen brinkmandemo, Kas 2		
eelvoorkomende ziekten er	n plagen	^
ups waargenomen	-	
littevlieg aargenomen	Licht	
adluis waargenomen	-	0
ineervlieg aargenomen	Matig	
bint waargenomen		
omatengalmijt aargenomen	Extreem	
ips waargenomen		
olluis waargenomen	Zwaar	
OPSIAAN		





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