

CHEMICAL-FREE INSECT CONTROL



**BigSis™ gives growers
urgently-needed
sustainable alternatives
to chemical insecticides,
boosting biodiversity
and improving control
of challenging pests.**

For a Perfect Storm ...



... a Perfect Solution

Growers depend on chemical insecticides to control pests

Regulatory
pressure reduces
product choice

Climate change
increases pest
pressure

Insect resistance
to remaining
control tools

Consumers
demand more
sustainable food



BigSis SWD Solution ...



... Season-Long Control

Helping tackle a major threat

The invasive fruit fly, spotted wing drosophila (SWD), is one of the biggest threats to fruit production globally. It attacks high-value soft fruit, including strawberries, grapes and cherries, and can cause 80% fruit loss.

Currently SWD control relies on chemical spray products, extra labour to pick fruit more frequently and other interventions. A more sustainable and effective approach is urgently needed.



Adult male SWD

Launching from 2023

BigSis SWD Solution will provide soft fruit growers with a powerful new tool for preventative control of this damaging pest.

After successful trials in 2021, **BigSis** will run further trials in 2022 on strawberry, cherry and raspberry.

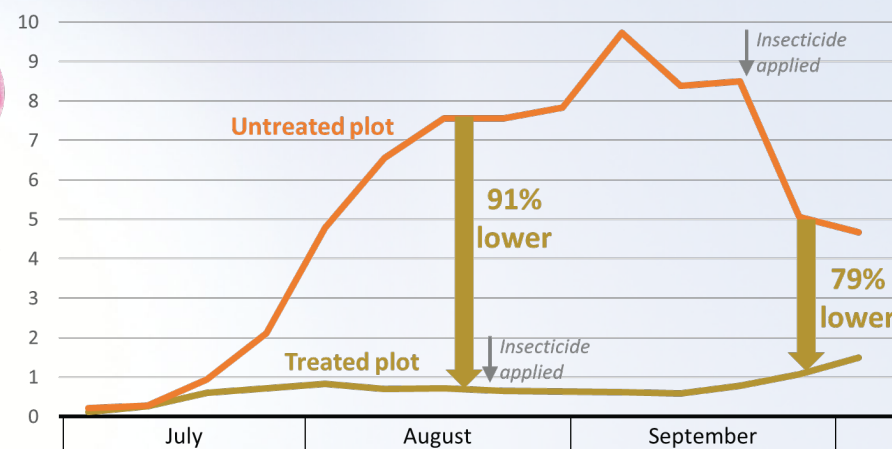
- UK launch: 2023
- International launch: 2024



Field trial results, England, 2021



Wild Female SWD/trap (3 week MA)



Buying BigSis SWD solution

BigSis SWD Solution is sold as a season-long SWD control service:

- A grower purchases from a distributor or online
- Production capacity is booked with **BigSis**
- **BigSis** sets up monitoring and agrees with the grower which days we will visit for releases
- **BigSis** makes regular releases throughout the season and sends progress reports

How SIT Works



The Sterile Insect Technique (SIT) has been used for sustainable and effective insect control for over 60 years.

How SIT controls insect pests

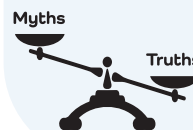
- 1 Produce sterile male insects



- 2 Release sterile males to mate with wild females



- 3 Females have no offspring



Myths and Truths

Some well-known SIT projects are large-scale initiatives backed by government agencies. This can create preconceptions about how SIT “must” be used. **BigSis** is harnessing the full versatility of this powerful solution to make it available commercially.

Myth: SIT only works for wide-area control

Truth: SIT is practical at farm-scale for most pests

For most species, males and females are not likely to travel far if they can find shelter and a mate. So field sizes as small as ten acres can use SIT; “border effects” are similar to other control solutions.

Myth: SIT only works for single dominant pests

Truth: SIT can control secondary pests in parallel

BigSis’ versatile platform can quickly and cheaply develop solutions for secondary pests and release these in conjunction with the main pest solution.

Myth: SIT is only useful for eradication

Truth: SIT is ideal for long-term preventative control


The mating instinct of the released sterile males makes them highly effective at finding the few wild females present when pest pressure is low. Hence SIT is ideal for preventing pest population explosions, maintaining a low level throughout the season and so minimising yield loss.

BigSis Reinvents SIT ...



BigSis hasn't just automated insect production, we've revolutionised it. We use robotics and artificial intelligence to rear insects individually, millions at a time.

Sex sorting is done with computer vision, making light work of this otherwise impossibly laborious task. Removing females ensures that the males we release are fully focused on finding and mating with wild females; it also avoids crop damage from flies piercing fruit to lay eggs.



Male codling moth



Male SWD

BigSis sterilises the male insects with a proprietary x-ray system that leaves them fitter than other methods. Taking advantage of our exquisite handling of each insect, we can ensure that x-rays are targeted at the insect's gonads and so greatly reduce the fitness penalty of sterilisation.

These innovations combine to reduce the cost per acre of SIT solutions by up to 90%. **BigSis** is taking SIT mainstream.



... and its Implementation

The **BigSis** solution does more than cut the cost of SIT. It also transforms how it is delivered in three important ways.

1 *Farm-scale, season-long control solutions will be sold through distributors.*

Growers trust distributors to recommend an integrated pest management (IPM) solution appropriate to their farm. The distributors will take orders but not hold stock; **BigSis** will deliver to the farm, typically weekly, and optionally release.

2 *Local native strains are used in each micro-production unit, optimising mating compatibility and minimising regulatory hurdles.*

Some species exhibit significant differences in mating compatibility across geographies; working with local native strains avoids this problem. It also avoids environmental concerns associated with trans-boundary movements.

3 *Micro-production units minimise transport distances and so reduce emissions.*

Automation enables efficient small-scale production. For example, a 3,000 ft² micro-production unit might produce about one million sterile male codling moths per week and treat over 7,000 acres.

Many More BigSis Ag Pest Solutions Coming Soon

BigSis' platform technology is being applied to create solutions for dozens of agricultural insect pests.



Thanks to their excellent safety profile, BigSis solutions need no regulatory permit for sale in England (UK) and four USA states: Washington, Oregon, California and Florida.

BigSis Codling Moth Solution

Yield loss is not inevitable!

After decades of controlling codling moth with standard chemical insecticide programs, it is easy to forget that the residual yield loss, typically 2-3%, is not inevitable.

The sterile insect technique (SIT) program that has been running in Canada for over 20 years has reduced the yield loss to below 0.2% in over 80% of orchards.



Codling moth larva

BigSis Codling Moth Solution aims to bring this valuable yield gain to apple and pear growers, driving excellent return on investment. We plan to launch in the UK in 2024 and internationally in 2025.

BigSis Olive Fly Solution

Olive fly is the dominant pest affecting the yield of over 10 million hectares of olive trees worldwide. **BigSis** aims to launch its solution in 2025.



Adult olive fly

BigSis European Grapevine Moth Solution

The European grapevine moth is a key pest affecting millions of hectares of vineyards throughout Southern Europe. **BigSis** aims to launch its solution in 2025.

Future Solutions

BigSis is focusing initially on important pests of fruit and vegetables. Subsequently it will address key row crop pests including fall armyworm and soybean looper.