Precision Pollination: New Tools Helping Berry Growers

Melinda Simpson, Blueberry Industry Development Officer, NSW DPIRD

Pollination plays a role in berry production, influencing not only yield but also fruit size, shape and uniformity. However, management has traditionally relied on relatively simple approaches, primarily hive stocking rates and visual observations.

As production systems become more intensive, particularly under tunnels, and seasonal conditions become more variable, it's essential to look for ways to better understand and manage pollination. A new generation of sensor technologies is beginning to provide that insight.

Two technologies gaining traction in horticulture are **AgriSound**, which measures pollinator activity in the crop, and **BeeSTAR**, which monitors hive health. Together, they give growers a clearer, more complete picture of how pollination is performing on farm.

AgriSound™: measuring pollination activity in real time

AgriSound uses bioacoustic sensors to detect, quantify and record pollinator activity directly within the crops. The sensors pick up bee's wingbeat frequencies and use machine learning to identify and measure pollinator activity, with micro-environmental information.

Placed within the canopy, these sensors are charged by solar power and connected independently to a cellular network, operating continuously to provide real-time data on pollinator activity across different parts of a block or tunnel.

Pollination activity can vary significantly depending on weather conditions, time of day, crop variety and flowering intensity. Even within the same farm, some areas may receive substantially less pollinator visitation than others.

By tracking activity levels over time and taking data-driven interventions, AgriSound allows growers to:

- Identify areas of low pollination activity before it impacts yields
- Assess whether hive stocking rates are sufficient
- Optimise hive placement within tunnels or blocks
- Monitor how pollination responds to weather events

This type of information has traditionally been difficult to capture, particularly at scale. Having continuous, objective data opens new opportunities to fine-tune pollination management.





AgriSound sensors stationed within blueberry orchards Photos credit: AgriSound

BeeSTAR: understanding hive performance

While measuring activity in the crop is one part of the equation, the strength and health of the hive itself are equally important.

BeeSTAR is an in-hive monitoring system designed to provide real-time insight into colony condition. Sensors are installed between frames to collect data on internal hive conditions, such as temperature and humidity.





BeeSTAR in hive sensor provides remote monitoring of hive health Photos credit: BeeSTAR

This information is used to generate indicators of hive health, including early warning signs of stress, queen issues or declining colony performance.



An example of the BeeSTAR dashboard
Photo credit: BeeSTAR

For berry growers, hive strength can be a significant but often hidden variable. Two hives may be counted the same on delivery but perform very differently in the field.

BeeSTAR helps address this by:

- Providing greater confidence in hive quality and performance
- Allowing early detection of failing or stressed colonies
- Supporting more transparent communication between growers and beekeepers
- Reducing reliance on manual hive inspections

For beekeepers, the technology enables more targeted management, improving efficiency while maintaining hive performance.

While emerging pollination technologies offer significant potential, their adoption will depend on practical considerations such as cost, data interpretation, connectivity and integration with existing farm systems. Despite these challenges, tools like AgriSound and BeeSTAR are helping shift pollination to one that can be measured and actively managed. By providing real-time insights into both pollinator activity and hive health, these technologies support more informed decision-making, improved crop outcomes and stronger collaboration between growers and beekeepers.

Get more information at:

AgriSound™

agrisound.io
hello@agrisound.io

Beestar®

www.beestar.com.au
zak@beestar.com.au