

REMOVE O₂ AND KILL PESTS

Tobacco beetles and tobacco moths are a nuisance when it comes to stored tobacco. Eric Van der Zwet, sales manager at the Dutch-based company, Besseling Group, spoke to TJI about **Controlled Atmosphere (CA)**, an alternative treatment to traditional fumigants for tobacco pest control.



Besseling Group's headquarters in Oosterblokker, the Netherlands

For decades, the tobacco industry has heavily relied on phosphine to fumigate stored tobacco. However, the occurrence of highly resistant populations of pests and concerns about the toxic effects of fumigants on health and the environment have forced the tobacco industry to search for alternative options to combat tobacco beetles (*Lasioderma serricornis*) and tobacco moths (*Ephestia elutella*). In 2008, the CORESTA commissioned the Food and Environment Research Agency (Fera) to assess the effectiveness of CA treatment for the control of tobacco moths and tobacco beetles. After more than four years of research, the scientific agency concluded that CA was a sustainable option for the tobacco industry.

TJI asked Besseling Group, a leading expert and supplier of CA solutions, why this method is a great alternative to traditional

approaches to pest control. Among other advantages of this treatment, says Van der Zwet, CA is non-toxic and residue-free and it does not have a negative impact on the treated product. "CA is the solution against [phosphine] (PH₃) insect resistance – because no oxygen means no life," said Van der Zwet. A Controlled Atmosphere (CA) environment kills pests by controlling the temperature of a gastight space and by decreasing the proportion of oxygen in the treated airspace. CA treatment results in a 100 per cent mortality rate of pests and it is suitable for other products besides tobacco, such as cocoa, soy, rice and grain, according to Besseling. Low oxygen levels in the controlled space cause the spiracles of insects to stay open, which leads to desiccation and ultimately death.

Another advantage of this control method is its flexibility, as Van der Zwet explains, it can

be used at different settings. "At a high temperature (+38°C) the [CA] treatment takes less time, but it will consume more energy than a treatment at a lower (+28°C) temperature," said Van der Zwet. In order for the treatment to be effective the duration of the treatment, the oxygen level, temperature and relative humidity have to be considered, according to Van der Zwet. The CORESTA number 12 guideline states that the total treatment time of tobacco depends on the temperature of the tobacco, amount of tobacco being treated and the position of the tobacco in the chamber. Generally, treatment times are comparable to that taken by phosphine fumigation. CA treatment, however, seems to be most effective when the oxygen level is lower, the temperature is higher and when the chamber containing the infected tobacco is properly sealed. In order to meet strict gastight standards set by CORESTA, Besseling offers a wide range of products that ensure gastight connections, such as gas tight coating, flanges, connectors with plugs and flexible connection pieces. Besseling's advice and expertise is based on over 90 years of experience in climate controlled storage. The company provides custom-made CA solutions for disinfestation along with long-term storage and controlled ripening solutions for products such as fruits and vegetables worldwide. The non-chemical pest control method can be used on all tobacco products starting from the leaf to the final product, says Van der Zwet. Storage and exporting companies are among the key markets for CA solutions. All companies, however, operating in the tobacco industry that have a problem with pests are a potential market for CA solutions. "Even manufacturing companies can implant this technology in their IPM system and locations," Van der Zwet explained.

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