

R&D centre in the 1970s with the aim of developing new kretek blends. Its contributions to the development of kretek include developing the first low-tar, low-nicotine kretek, the first kretek cigarillo, a brown-paper kretek, a black-paper kretek and a cherry-flavoured and vanilla-flavoured kretek.

The strength of local processors

One of the main local tobacco leaf processing companies is PT Mangli Djaya Raya (MDR), headquartered in Jember. The company employs about 7,500 people at 24 facilities throughout the country and buys, handles, processes, packs and exports tobacco for its customers, which range from large multinationals to small manufacturers. It also supplies leaf to many international dealers and brokers. President & CEO, Nyoto Permadi, says, “MDR’s customers are growing every year. Our vast networks of farmers have also ensured that we will not be short of tobacco when it comes to fulfilling our obligations to the customers.”

Chance to increase production

With the recent rise in tobacco leaf prices, and as demand for quality leaf increases and tobacco inventories shrink, Indonesia, home to a diverse variety of different tobaccos, will be in a unique position to increase supplies to the global market. Indonesia has long been a preferred source of quality leaf for cigar manufacture, and for its Virginia and Burley tobaccos. The country now has the opportunity to increase production of its exportable tobaccos, such as flue-cured Virginia and consolidate its position as a preferred supplier of quality leaf. The country has the capacity to produce more tobacco leaf than it currently is, but, wary of causing prices to fall, has only slightly increased its production in recent years. With the current global rise in prices, now could be time to ramp up production without fear of adverse price consequences.

Tim Glogan



CA chambers

Photo: Eco2

Tricky science

The Cooperation Centre for Scientific Research Relative to Tobacco (CORESTA) currently conducts further research before issuing guidelines on using Controlled Atmosphere in tobacco. Once the guidelines will be out, what will be the main considerations for installing the technology?

One year ago, TJI reported about controlled atmosphere (CA) as an alternative pest control method to phosphine fumigation. Back then, it was hoped that the CORESTA Subgroup on Pest and Sanitation Management in Stored Tobacco would issue standard guidelines on how to use CA in tobacco at its 2011 meeting in South Africa. The Subgroup did meet in April in Cape Town, and discussed, among other things, phosphine resistance in cigarette beetles and reviewed the data generated from a number of CA experiments. But the decision was made to not establish a standard on CA at this time. What had happened?

“Things come up as you are doing research,” explains Vernon Schmidt, entomologist and senior staff scientist at RJ Reynolds Tobacco Company in the US and co-chairman of the CORESTA Subgroup. “Such is science. You start with some parameters and then you discover that you need to collect and analyse

more data to fulfill the scientific standard you have set.”

Indeed, testing the technology which kills insects in stored tobacco by depriving them of oxygen, has been done thoroughly and meticulously. Starting back in 2009, the first tests were set up to find out whether CA also works reliably in tobacco. (It has worked reliably in many other commodities such as rice nuts or grain for many years.) That is, does CA guarantee a 100 per cent mortality rate amongst insects by the end of the treatment? To answer this question, four parameters – oxygen level, temperature, humidity, and the duration of the treatment – and their interrelatedness had to be analysed. By April last year, it became clear that firstly, CA is a reliable method against cigarette beetles at an oxygen level of below 0.5 per cent for a specified time and that secondly, as a start, two sets of parameters should be set for the industry – one for low and one for high starting temperatures. (See also TJI 4/2010)

While the first real-life trials were undertaken with just a few hundred insects, this year, test trials were run with several thousand insects to support statistical analysis. CORESTA member companies shared the research: While BAT conducted tests with 8,000 insects at 38 degrees Celsius, over four days treatment time, JTI ran the tests at 28 degrees Celsius over nine days.

“These latest tests trials finished as planned and we now await the mortality results which take a further 12 weeks post trial,” says Jane Perry, Product Integrity Manager at BAT, who is in charge of running the tests for BAT. The Food and Environment agency of the UK (FERA) – which is a member of the Subgroup on Pest and Sanitation Management in Stored Tobacco along with 21 member companies – has been brought in to support the latest BAT trial. FERA’s protocol will be incorporated into the final report on CA which the CORESTA Subgroup will submit to the CORESTA Board for a decision and hopefully approval.

The taste

Yet, this final report awaits further tests still as the Subgroup is devoted to analyse all eventualities of the CA technology.

The final issue now is to consider the effect of CA on the taste and the quality of tobacco.

The researchers of the group do not think that CA could have such an effect. “Our hypothesis is that tobacco quality and taste are not affected by CA treatments,” says Schmidt at RJ Reynolds, “but verifying this is essential.”

At BAT, Perry agrees: “CA is applied in a vast variety of products and organoleptic effects [effects impacting taste, colour, odour and feel] are not known for any commodity. Everything from grain and rice to nuts and dried fruit is treated with CA in storage or packed for longer shelf-life or after-ripening in deprived atmospheric surroundings, such as vacuum packaging. This is why literature on CA in other commodities is widely available.”

“However,” continues Perry, “in the world of tobacco, we are committed to our duty of care to our consumers and so there is a requirement to investigate any impact of CA on finished cigarettes.”

Such tests do, of course, take time, prolonging the wait for a CA standard. Couldn’t these tests have been conducted together with the previous tests? Unfortunately not. Says Schmidt: “We needed to fix the parameters for an optimal procedure of the CA technology first,” he explained. “Only when we finish plant testing can we take the treated tobacco for further tests such as tasting. We have to take one step at the time.”

The test results on taste and quality will complete the report that the Subgroup delivers to the CORESTA Board. Schmidt is hopeful that the testing and the Board’s approval of the new CA standard can be completed by the end of the year.

This step is eagerly awaited by the industry, according to the two providers of CA technology – ECO2 and B-Cat, both from the Netherlands. They report several dozens of interested parties.

Clearly, the possibility to finally treat phosphine resistant cigarette beetles with success is great. But Jane Perry of BAT also sounds a note of caution: “Controlled Atmosphere treatment is another tool in our toolbox of pest control, but it will not solve all our problems,” she said. “What we have to be clear about is that, like phosphine, CA offers no residual effect. So as soon as the tobacco comes out of the treatment chambers it can be contaminated again by putting it, for example, in a contaminated environment.”

Perry emphasizes that it is important for the tobacco industry to look at the whole chain of conduct, including housekeeping, the supply chain and the way tobacco is handled in storage warehouses and the transport to and from there.

The process

At ECO2, manager Marketing and Sales, Jacobien Bakker, agrees that CA treatment has to be set up and integrated into the logistic chain in a way that minimises the risk of recontamination. “CA fits well at several points in the logistics process,” she explains. “There are three possibilities. The to- ▶



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bacco could be treated before it enters the factory, or in boxes before it is stored in a warehouse. The third possibility is advisable if the tobacco goes directly to the customer. In this case insect infestation and damage to the tobacco can be minimised if the tobacco is treated just before it is exported, that is either in the factory before loading it into a container or in the container at a

facility at the port.”

There are considerations within the industry to set up two areas in factories and warehouses, one “dirty” and one clean area. This set up, which is already commonly applied in food commodities, would be a great improvement in avoiding possible re-contamination with the tobacco beetle & moth in treated tobacco.

But the considerations should not stop there. Installing a new technology such as CA also holds the opportunity to rethink and possibly to completely rearrange the logistics process. Such considerations are even necessary because – due to the treatment being held in a specific chamber – it is often not possible to simply swap phosphine fumigation for CA without adjusting the process of handling tobacco. “Installing CA is not only a matter of investing in a new technology but also of doing pesticide treatment differently,” says Bakker. “We inform and advise interested parties on how the technology works and how it works most efficiently within their existing business processes.”

A customer who handles tobacco has to consider two main things for installing CA technology. One, how much tobacco they need to treat per year and two, how they want to integrate CA treatment into the existing fumigation process. With regard to the volumes, tobacco dealers have flexibility on their side. The chambers needed for treating tobacco in a controlled atmosphere can be built in many sizes, starting from as little as 40 sqm, up to 1,000 sqm.

“To determine the optimal size, we calculate the throughput of tobacco,” says Bakker. “Next, we ask interested customers at what point in the logistics process they currently fumigate and at what point they would ideally want to treat their tobacco.”

The costs

Suppliers of leaf tobacco may already be convinced of the advantage of CA, but still, they want the final approval from CORESTA before undertaking a big investment like this. Because of the high-tech equipment needed, including generators for the air pumps, airtight chambers etc, it is indeed a fairly big investment, however, in the long run the treatment costs per carton could well be lower than for phosphine fumigation, and certainly for freezing. “If you take an average cost of fumigation of about EUR 50 per tonne of tobacco in an average priced environment in Europe,



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CA is cheaper in the long run," says René Luyten, director and owner of B-Cat, "that is, when including the initial investment in the calculation."

The precise costs of the technology depend on several factors specific to a company and the country it is located in. "It is hard to say in general terms what a CA treatment will cost as every country has different costs for say, electricity or labour," says Luyten. "In India, the costs of running the technology could be comparably expensive as the labour power that you need for fumigation is cheap. Also, some countries charge import duties on machinery. Some companies may already fumigate in special rooms so there is the possibility to convert it to a CA room at lower costs. There are many aspects we have to consider before giving a quotation." One of the main costs relates to the amount of heating required which depends on the initial temperature of the

stored tobacco. Options being investigated are to heat up the tobacco to 28 degree Celsius, and apply a treatment time of nine days, or treat it at 38 degrees Celsius which reduces the treatment time to four days. Again, it is difficult to specify how long this heating up period will take, as it depends on the set up of the technology, but as a rule of thumb one can consider the daily increase of temperature to be roughly

about 6 degrees. This heating period of the tobacco has to be added to the actual treatment time and the time for loading and unloading. At 38 degrees Celsius, the total time it takes to apply CA to tobacco is about 7 days, which compares to the current fumigation process.

Of course, many tobacco processing countries have natural outside temperatures of close to 30 degrees so heating might not be necessary. A back-up heater, for the event that temperatures drop overnight, might still be useful. According to Luyten of B-Cat the heater makes up a rather small part of the overall set up costs. Also, because heating costs are mostly comparably low to the overall costs of treating tobacco, it could well be more efficient to heat the tobacco up to 38 degrees Celsius even in moderately tempered countries such as European countries.

Anja Helk

In essence

- ▶ CORESTA conducts final test trials on Controlled Atmosphere (CA)
- ▶ Issuance of CA standard guidelines expected this year
- ▶ CA treatment can be integrated in logistics chain in several ways



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