Gaspace 2 at Praktijkonderzoek Plant

An environmentally acceptable method of controlling mite and thrips infestation of flower bulbs, especially lilies and tulips, during storage is being researched by the Applied Plant Research Centre associated with Wageningen University and Research Centre at Lisse in The Netherlands.

A chemical treatment has been used for a number of years to minimise bulb degradation during storage. The aim of the current research is to eliminate the need for chemicals by controlling the storage atmosphere.

The drive to develop a new storage regime is because the most widely used chemical, Actellic, pirimiphos-methyl, an organophosphorothioate compound with moderate acute toxicity, may be banned as an insecticide within the next few years. In addition, there is evidence that mites and thrips are becoming Actellic resistant at safe dose levels.

The approach being investigated uses a mixture of oxygen and carbon dioxide as the storage atmosphere to kill mites and thrips quickly without the need for a chemical insecticide. Small-scale experiments, using 1 litre jars, have shown that one of the two types of mites is killed easily but the other can survive, unless the gas mix is precisely controlled. Various gas mixes are being tested to find the most effective against thrips and both types of mites. The gas mix in the experimental atmosphere is checked initially and then monitored over several days, using a Systech Gaspace2 headspace gas analyser, to determine the effects of the natural respiration of the bulbs during storage.

According to Cor Conijn, the researcher in charge of the project, even a very small change in the ratio of oxygen to carbon dioxide can cause a significant change in the effectiveness of the process. The gas mix is monitored continuously using the Systech Gaspace2, which can interface with a data logging system using the RS232 data interface or the 4 – 20 mA analogue output.

The current research is aimed at providing an environmentally acceptable insect control regime for the 200 cubic metre bulk storage units, each of which can store many hundreds of thousands of bulbs. When this project is completed in about two years time, the team will begin developing retail packs for bulbs using modified atmosphere packaging (MAP) to maintain the quality of the bulbs from bulk storage to end user.

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