USE OF CONTROLLED ATMOSPHERE FOR PEST CONTROL IN DRIED FRUITS & NUTS

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Summary
Controlled Atmospheres (CA), based on low-oxygen is commercially used world-wide to control post harvest insects in infested commodities. CA is not only used for control of insects in organic commodities, but also used for conventional produced products. The in to control insects in post harvest commodities. To reach low levels of oxygen, gastight areas are a bare necessity. Since a very large portion of the storage of food is done in silos, it is a natural way to progress the application of CA in silos.

The Dutch company EcO_2, founder of practical applications of CA, has conducted several tests for the control of dried fruit insects together with different dried fruits:

Test 1: Dried peaches from South Africa. The goal of this research was to specify the total time frame for increase in product temperature to an average of 30 degrees C. which is the ideal treatment temperature for control of dried fruit insects. The increase in temperature was measured by 5 different data loggers, placed in the dried peaches at different positions in a gastight treatment chamber. Results showed a total time of 21 hours to reach a product temperature of 30 degrees C, starting from 15 degrees C.

Test 2: Dried figs from Greece. The goal of this research was to specify the effectiveness of Tribolium and Sitophilus species, present in commercially packed dried figs. The experiment was conducted in November 2007 in winter season in Europe, applying Controlled Atmosphere in a gastight treatment room. Upon arrival of the test, temperature of the product was 11 degrees C. In 2,5 days the product temperature reached the ideal treatment temperature of 32 degrees C. Simultaneously during heating up of the products, the oxygen is decreased to < 1% in the room for effective insect control. Results showed 100% mortality of all Tribolium and Sitophilus species in all developmental stages. Total treatment duration was 5,5 days. Quality assurance tests of the treated dried figs, showed no negative effects on the quality of the products.

Test 3: Cashew Kernels from Vietnam. On 15th of June 2009, a test was performed with the goal to specify the total treatment time for cashew kernels, infested with saw-tooth grain beetle. In total 172 bags of Cashew kernels were treated. Total duration of treatment was 3,5 days with an average product temperature of 35 degrees C. and low-oxygen level of < 1.5%.

Advantages of CA treatment
- no residues left on treated products
- effective control of post harvest pest in each life stage
- no negative influences on products treated
- no changes of creating insect resistance
- no degradation of the ozone

- low cost per m/tonnes

Keywords:
Controlled Atmospheres, disinfestations, stored product pest control, fumigation, insects control, silo treatments, converter system, low-oxygen, dried fruits, cashews.