

## ANAEROBIC GROWTH OF STORAGE YEAST IN CONTROLLED ATMOSPHERE STORAGE OF INTERMEDIATE MOISTURE GRAINS

D. RICHARD-MOLARD and B. CAHAGNIER

*Laboratory of Cereal Microbiology and Technology INRA, Nantes, France*

In vitro experiments carried out on cereal grains with intermediate moisture content ( $a_w$  around 0.90) have shown extremely low oxygen requirements for so called "storage yeasts". These results indicated that microbiological stabilization of such grains would be impossible to achieve at the farm level, where sophisticated structures for hermetic storage are not available. Although storage yeasts such as *Hyphopichia burtonii*, *Candida* sp. or *Cryptococcus* sp. have an absolute need for oxygen for ergosterol biosynthesis, this requirement is so weak that one must consider from a practical point of view that they are able to grow almost anaerobically. So the question of what is the natural "microbial oxygen demand in grains" was addressed. Experiments at the farm level demonstrated that at water contents between 18 to 21% respiration of storage yeasts was sufficient to consume oxygen that penetrated silos filled with ground, well compressed wheat or maize when it was covered with a plastic sheet. Dry matter losses remained very slight in the outermost layers of grain in contact with air, where temperature rose up to 30-40°C in one or two days, without evident damage to the nutritional value of the grain. Up to now, so stored cereals have appeared perfectly sound and no accident due to a possible pathogenicity or toxinogenicity of these yeasts has been reported.