

Title Effect of low temperature on respiration rate, sugars, phenolics and peroxidase activity changes in inner bud of onion during break of dormancy

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#### **Abstract**

Respiration rate (O<sub>2</sub> consumption of whole onions kept two months at 20 deg C), soluble sugars, total phenolics and peroxidase (POD) activity were measured in inner bud tissues during break of dormancy of onion bulbs (*Allium cepa* cv. Rouge Amposta) treated for four weeks at 0 deg C and stored in the dark at 20 deg C. After 8 weeks, respiration rate RRO<sub>2</sub> of sprouted onions was 52% higher than initial RR A "peak" of soluble sugars (glucose, fructose and sucrose) observed in cold-treated bulbs (from 9 to 19 mg g<sup>-1</sup> FW) after three weeks. In the control bulbs, a similar peak was observed after 6 weeks. In cold-treated onions, a slight increase in phenolics (from 0.17 to 0.2 mg g<sup>-1</sup> FW) was observed during the first two weeks of cooling, and then a decrease to 0.11 mg g<sup>-1</sup> FW after 8 weeks. In inner buds of control bulbs, a slight increase from 0.17 to 0.2 mg g<sup>-1</sup> FW was observed after 5 weeks and a decrease to 0.15 mg after 7 weeks was observed when the bulbs began to sprout. Peroxidase activity showed the same pattern as the phenolics. In cold-treated bulbs, activity increased to 1.7 U g<sup>-1</sup> FW after 2 weeks, then decreased to 1.1 U g<sup>-1</sup> FW during the last four weeks. In the control samples, a decrease of 25% was noted after 8 weeks. This decrease in POD activity coincided with the decrease in phenolics and the onset of sprouting. With cold treatment, total sprouting was observed after 8 weeks. Only 20% of the control bulbs started sprouting after the same period.