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"The colours and antioxidants of fruits and
vegetables: what genes and horticultural
practices can do"**



**Innovative protection strategies for the cultivation of lettuce and
lamb's lettuce baby leaf: on the antioxidant compounds accumulation.**

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Introduction

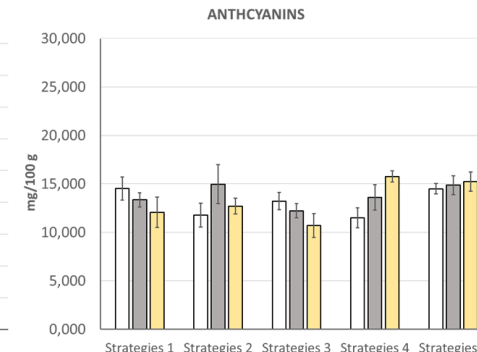
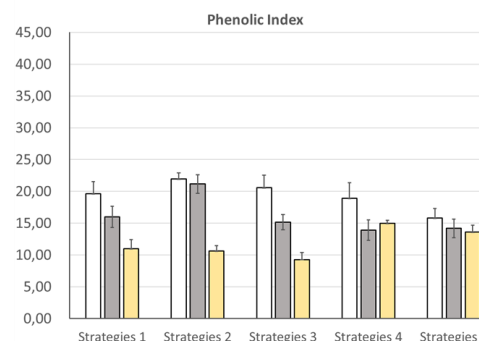
The production of fresh vegetables ready to eat represents one of the most increasing business in the field of horticulture. These products are intensively cultivated in high-tech greenhouses and the restricted time among cultivations hinders the implementation of adequate crops rotation or agronomic techniques aimed at reducing the incidence of soil-borne pathogens. Plant protection is due to the high use of agrochemicals. Nowadays, agrochemicals are safer but represent a cost for companies and sometimes they have a negative environmental impact. These crops are characterized by rather short crop cycles, which hinder the use of agrochemicals and so make necessary the investigation of innovative strategies for plant diseases control. Furthermore, these alternative strategies must allow the obtaining of high-quality products.

Materials and Methods

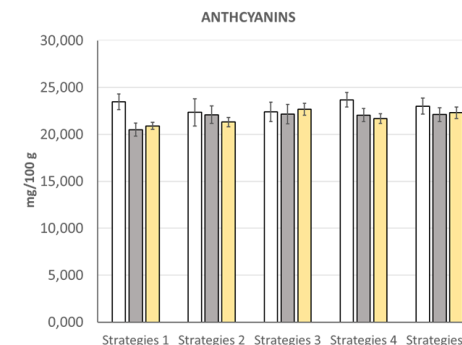
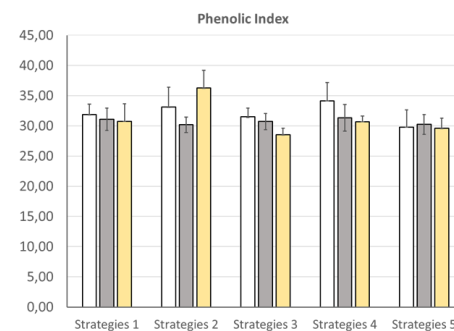
In the present trial, two crops commonly used to produce cut leafy vegetables were evaluated: lamb's lettuce (*Valerianella locusta* L. Laterr.) and lettuce (*Lactuca sativa* L.). The cultivation was carried out under tunnels. The impact of four different crop defense strategies (1-4) was evaluated and compared with an untreated control (5).

In details, the impact of the defense strategies on the presence of antioxidants and on their shelf life during storage was studied. Assays were carried out to measure the concentrations of Polyphenols, measured by the calculation of the Phenolic Index, and anthocyanins evaluated as Cyanidin equivalent. Furthermore, the assays were carried out in three times: T0 (sampling time), T7 and T9, respectively at seven and nine days of storage, in plastic bags, at 4 ° C.

Results



Lactuca sativa L



Valerianella locusta (L.) Laterr.

The results showed differences in relation to the different strategies used and between the two species studied. Despite the differences between the species, it was possible to identify for *Lactuca sativa* L. a strategy (Strategies 5) that seems to allow the achievement of the highest quality standards, in terms of antioxidant compounds accumulation and preservation during the first 7 days of storage.

Conclusions

The phenolic index of some species, such as *Lactuca sativa* L, can be dramatically affected by the defense strategies applied. Among the qualitative characteristics of cut leafy vegetables, the presence of antioxidants is one of the most important parameters. In contrast to other quality parameters, such as the visual appearance, which are directly related to the consumers, the presence of antioxidants represents an added value that is not visible but crucial for the protection and the promotion of human health.