LETTUCE

Saline stress tolerance

PLACE

Test location:	Landlab srl, Quinto Vicentino (VI)
Person in charge:	Landlab srl
Number of thesis:	20
Type of cultivation:	Pot in greenhouse
Technique of distribution:	Foliar
Period:	21/05/2021 – 30/06/2021
Variety:	Gentile
Tested products:	ILSAC-on

QUALITY CONTROL APPROVATO

OBJECTIVE

To evaluate the efficacy of the enzymatic hydrolysate of Fabaceae on increasing the lettuce tolerance to saline stress.

RESULTS ACHIEVED

In cooperation with Landlab srl, a test was carried out to evaluate the efficacy of some **ILSA** products and prototypes in inducing a better tolerance to saline stress. The test was carried out in greenhouses in 15 x 15 pots (volume 3 L) with 70% sand + 30% soil, maintaining an optimal water capacity (by sub-irrigation and manual irrigation pot by pot) and, at the same time, monitoring the salinity of the substrate with the use of a conductivity meter.
Here is an excerpt of the test with the results of IlsaC-on alone, a plant biostimulant based on enzymatic hydrolysate of Fabaceae, which has already stood out for this effect in the past. Applied by foliar application, at a dosage of 150 grams per 100 litres of water, IlsaC-on significantly improved the saline stress tolerance of lettuce plants, confirming its biostimulating effect.
The results, in terms of plant coverage and plant biomass weight, show that IlsaC-on reduced the negative effect of saline stress by increasing the biomass by about 12% compared to plants subjected to the same stress.

TEST PROTOCOL

STAGE	ILSA thesis	Positive Untreated	Negative Untreated
FOLIAR APPLICATIONS			
31/05/2021 (after the second application with NaCl)	**IlsaC-on: 150 g/100 l**	/	/ (no stress)
09/06/2021 (after the third application with NaCl)	**IlsaC-on: 150 g/100 l**	/	/ (no stress)

Transplant carried out on 21/05/2021.
Saline stress was induced through four applications of NaCl, at a concentration of 1% with respect to the solution, for a total of 7.5 grams per plant.
Dates of application of NaCl: 28/05/2021, 31/05/2021, 07/06/2021 and 11/06/2021.
Alongside an untreated subjected to the same stress conditions, another untreated was added, without the four applications of NaCl.

ILSA
The green evolution

LETTUCE

Saline stress tolerance

RESULTS ACHIEVED

DIA (Digital Image Analysis): A non-destructive method that collects high-resolution images of all the plants being tested and analyses them using dedicated WinCam software, which returns the LGC (Living Ground Cover) expressed in cm^2 as the output. This data refers to the two-dimensional surface covered by the leaves of the plants.

	ILSA thesis	Positive Untreated	Negative Untreated
27/05/2021 (pre-stress)	**88.95**	86.06	82.76
04/06/2021 (after two applications with NaCl)	**207.73**	201.73	216.27
09/06/2021(after the third application with NaCl)	**259.34**	246.10	397.24

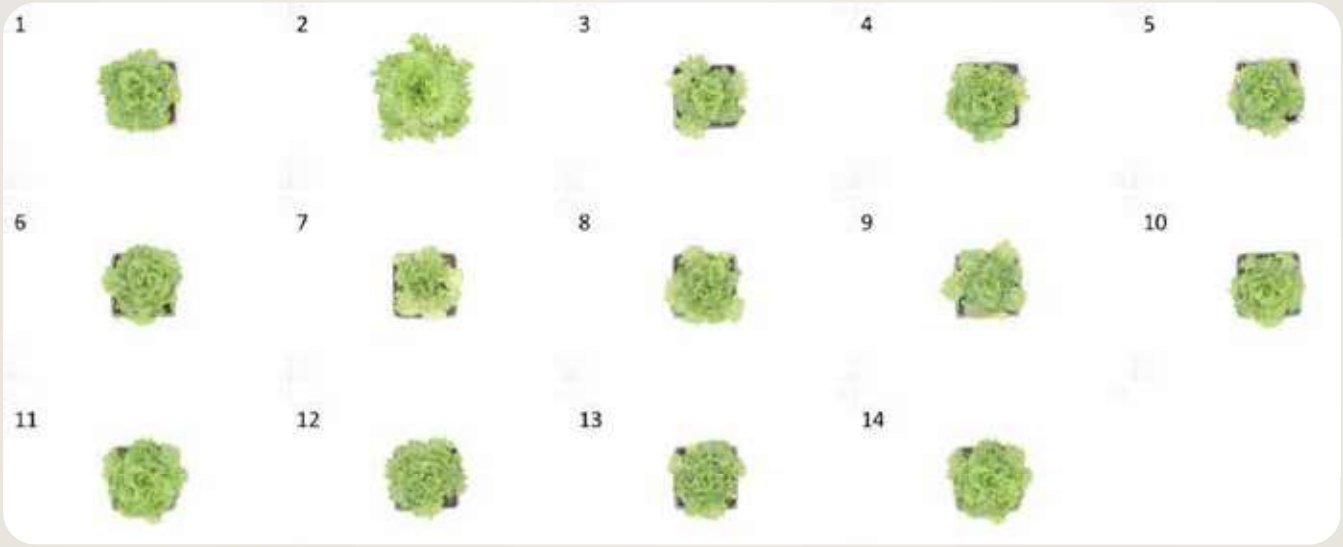
SPAD: The SPAD measurement returns a value that is positively correlated with the chlorophyll content of the lettuce leaves. Higher values indicate a more intense green colour and therefore a higher concentration of chlorophyll in the leaf.

	ILSA thesis	Positive Untreated	Negative Untreated
27/05/2021 (pre-stress)	**20.11**	19.94	18.47
04/06/2021 (after two applications with NaCl)	**23.79**	25.54	25.87
09/06/2021(after the third application with NaCl)	**30.35**	29.65	30.45

Fresh biomass (grams): evaluated at the end of the test. The plants were cut at the height of the collar and weighed.

	ILSA thesis	Positive Untreated	Negative Untreated
Fresh biomass (g) 14/06/2021	**36.02**	32.16	92.49

Pictures summarising the course of the test on lettuce, with the final cut for biomass measurement. IlsaC-on induced a greater accumulation of biomass than the positive control, equal to +11.9%.



Example of images made with the DIA (Digital Image Analysis) method. IlsaC-on, applied at 150 g/100 l, promoted a +4% leaf coverage compared to the positive control. Furthermore, in terms of SPAD, and therefore photosynthetic efficiency, it showed the best effect compared to all other thesis, as the stress conditions worsened.

ILSA
The green evolution