

WHITEPAPER

Boosting Lettuce Resilience

The advantage of Intra Eco Shield in Hydroponic Systems



Lettuce production is popular, it has been extended from only growing outdoor to outdoor and indoor Hydroponic growing. But with climate change around the corner, growing conditions are becoming increasingly difficult, even in the controlled inhouse environments. Providing the plant with the right nutrients in the most efficient way is more challenging than ever before. Biostimulants are designed to help plants perform at their best under these difficult circumstances.

Intra Eco Shield is such a unique developed biostimulant, designed to help plants balance nutrient uptake. At the same time, it helps harden the cell walls to alleviate heat stress and mechanical damage. Intra Eco Shield combines several trace elements with ortho-silicic acid, creating the perfect combination for increased resilience.

Trial in hydroponic lettuce

At the internationally known trial center “Proefstation voor de Groenteteelt” in Belgium, Intra Eco Shield was evaluated on Butterhead (*Presteria*) and Lollo Bionda (*Lamarre*) lettuces. The trial took place from February 15th to April 4th, 2024. Intra Eco Shield was added to the standard nutrient solution at two different dosages: 250 ml/ha/week and 500 ml/ha/week. To induce the presence of tip burn, the climate was set as challenging for the plants; daytime humidity was set to 70% RV and nighttime humidity to 80% RV. After one month, additional draft was created by opening the windows slightly earlier than usual.

Improved root development

In addition to assessing the harvest and incidence of tip burn, root development was monitored and evaluated throughout the trial. The results of the mid-term evaluation showed both treatments with Intra Eco Shield showed significantly improved root development in the Lollo Bionda, as shown in **Table 1** and **Figure 1**. At the time of harvest, root quantity remained significantly higher for the crops treated with Intra Eco Shield. Significant differences in root health were also observed at harvest in the Butterhead variety. The treatment with 250 ml/ha showed the best results.

| Object | Root health | Root quantity |
|-----------|------------------|------------------|
| Control | 8,5 ^c | 6,4 ^b |
| 250 ml/ha | 9,0 ^a | 6,8 ^a |
| 500 ml/ha | 8,7 ^b | 6,7 ^a |

1= bad, 9=good (Duncan, p=0,1)

➡ **Table 1.** Root assessment of Lollo Bionda after four weeks on the gutter. The lowercase letters denote statistical differences.

➡ **Figure 2.** Overview of the roots during the mid-term assessment of Lollo Bionda (13/03/2024)



Improved yield

After the final harvest of the Butterhead lettuce, a higher yield was found for the treated groups. The 250 ml/ha treatment with Intra Eco Shield showed the best results, as indicated in Table 2. Additionally, the Butterhead crop had more densely packed and healthier heads at harvest (see **Figure 2**). In the end of production a small indication of tip burn was found, no significant differences were noted between the untreated and treated groups. In the Lollo Bionda, the average crop weight was the same for both the control and treated groups, and no tip burn was found in this group.

| Object | Average weight (g/head) | Harvestable heads (%) | Loss because of tipburn (%) |
|-----------|-------------------------|-----------------------|-----------------------------|
| Control | 473,7 ^a | 100 | 0 |
| 250 ml/ha | 490,9 ^a | 100 | 0 |
| 500 ml/ha | 478,2 ^a | 100 | 0 |

(Duncan, p=0,1)

Table 2. Harvest information butterhead. The lowercase letters denote statistical differences.

Post harvest, differences in shelf life were evaluated after 1 and 4 days. Already after 1 day, there was a significant difference in vein discoloration. After 4 days, the group treated with 250 ml/ha Intra Eco Shield showed the best shelf life, with almost no discoloration of the veins or blemishes.



Figure 2. Overview of butterhead lettuce at the day of harvest (04/04/2024)

Conclusion

Intra Eco Shield has a positive effect on the development and post-harvest quality of both Butterhead and Lollo Bionda lettuce. Treatments with Intra Eco Shield improve both the quality and quantity of roots, resulting in better production and improved shelf life. A dosage of 250 ml/ha is recommended for use in hydroponic systems.

‘Improve the quality and quantity of your crop’