

Foliar Boron Fertilization

Foliar application of fertilizers has a great place in fertilizing plants with mineral nutrients. Foliar fertilization is a form of fertilizer application that is increasingly being considered, especially in the application of micronutrients to plants. The two most important factors in applying fertilizer to plants through leaves: i) how soluble the fertilizer to be applied is, and ii) how the element to be applied is to be transported in the phloem channel in the plant. Since the boron element is not mobile in the phloem in a very large part of the plants, some factors should be considered in the foliar applications of this element. For example, due to the problem of boron not being transported within the plant, there is very high amount of boron in the old leaves where the growth is completed, while there is very little boron in the young leaves. For this reason, it is useful to know this in leaf analyzes performed for confirmation purposes before foliar applications, and young leaves should be taken into account in the analysis.

A study on young orange trees is interesting in that it shows that the transport of foliar applied boron in the plant is indeed very low. A stable boron isotope was used in this study, and it was determined that only 3.2% of the boron applied leaf could be transported to the new growing shoots within 240 days and the rest remained on the directly applied leaves. Such results have been found and reported in numerous other plant species. However, it is known that boron can be transported in some perennial plants (trees), even if it is a small amount, and this transport takes place by complexation through compounds such as sorbitol and mannitol, which are specific to those plants. For example, boron can be transported in the phloem in sorbitol producing plants to which boron is bound. However, it is useful to know that it will not be beneficial to give, for example, B-mannitol externally to plants that do not have the capacity to produce polyols such as mannitol and sorbitol. On the other hand, in order for foliar boron fertilization to be successful, it is beneficial to apply boron to the leaves several times, intermittently.



It is important to know the following issue here: According to the findings, the increases in growth and yield with foliar boron application in conditions of boron deficiency are not as high as the increases achieved with soil boron application. In a study conducted on the sunflower plants, which are highly susceptible to boron deficiency, soil fertilization was found to be much more effective in increasing both yield and boron content in young leaves than foliar boron fertilization. In fact, the boron concentration of the flower bed in sunflower was almost not affected by foliar boron application. These results demonstrate that foliar applied boron is not possible to carry phloem in the plant and it will not be sufficient to increase the boron concentration in the generative organs with high boron demand such as flower head. Similar results were also found in plants with high boron requirements such as rapeseed.

The results reveal that foliar boron fertilization, which is considered to reduce the occurrence of possible yield decreases due to boron deficiency in plant production, should be repeated several times and is not as effective as soil boron applications.



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