



# Improving growth, productivity, and chemical composition of *Trachyspermum ammi* L. by using organic and chemical fertilization in the presence of boron

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## ABSTRACT

The substitution of chemical fertilizers with organic and biofertilizers has gained increased attention in recent years in order to sustain high yields and protect the environment. This study was carried out to determine the vegetative growth, chemical compositions, and essential oil content of *Trachyspermum ammi* in response to different levels of fertilizers and boron as well as their combinations. Five levels of fertilizers, N1: control, N2: 100% mineral fertilizer, N3: 50 % organic manure with biofertilizer, N4: 75 % organic manure with biofertilizer, and N5: 100 % organic manure with biofertilizer, and three levels of boron 0, 100 and 200 mg/L were used. The results obtained in a 2-years study (2018—19) with fifteen different fertilization treatments showed that the combined treatments of N2 with 200 mg/L boron yielded the highest values for the vegetative growth parameters and seed yield. Moreover, it enhanced mineral contents (N, P, and K). On the other hand, the highest percentage of seed essential oil (4.01 and 4.02 %) was noted after applying N5 with 200 mg/L boron in both seasons. Similarly, this dose produced the highest yield of  $\alpha$ -thujene (50.24 %). These results suggested that organic sources supplemented by NPK may fully substitute for chemical fertilizers without harming the growth and seed yield, chemical constituents and oil productivity of ajwain