Boost the productivity and yield of cucurbitaceous crops by foliar application of boron

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Boron deficiency is being increasingly reported in different crops and soils across the country limiting the crop performance. Foliar application of boron is also known to enhance the vine growth, number of fruits, fruit size and yield of many cucurbitaceous crops. Earlier, in cucumber (*Cucumis sativus* L.) a significance response to 3 foliar sprays of 25ppm of boric acid was observed under Ranchi (Jharkhand) conditions. The fruit number increased from 10.5/vine to 12.2 in the vines that received foliar application of boric acid. The fruit weight also increased from 368g to 412g. This led to an increased fruit yield of 62.5 tonnes/ha by boron application compared to 48.6 in 'control' that did not receive any foliar sprays of boric acid. This technology was tested under Bangalore conditions on ash gourd (2008), pumpkin (2009) and bitter gourd (2010) by Shri Umesh of Gopalpur, Hessaraghatta. In addition to boric acid, urea was dissolved in the spray solution at 0.5% to enhance absorption of applied boron.This progressive farmer obtained 28-36% increased production at an expense of Rs. 50/ha on boric acid and urea in each crop. Presently, Shri Bhadradev Kumar of Muthkur also adopted foliar application of 25 ppm boric acid along with 1% urea as the adjuvant, applied 3 times from 8-leaf stage (25 days after planting to flowering (45 days). He obtained an average an average increase of 2.9 fruits/vine from 1.8 and of 5.8kg/fruit from 3.9kg in ash gourd (photograph 1) Against an estimated yield of 56 t/ha (23 under 'control'), Shri Kumar achieved 49 tonnes/ha production by adopting this technology. In 'Arka Baharl bottle gourd grown at IIHR farm, the number of fruits increased from 2.14 to 3.00/vine. The weight of the fruit increased to 950 as against 880g leading to an increase of 50% of bottle gourd fruits.

This substantial increase in production is attributed to an increased fruit set caused by improved health of the pollen. A favorable boron status of the cucurbit vine caused (i) proper growth of pollen tube after fertilization leading to an enhanced of fertilization of eggs in the ovary leading ultimately to enhanced the fruit set in each vine; and (ii) substantial growth or enlargement of the fruit since every fertilized egg in the ovary releases growth hormones responsible for fruit enlargement leading to a significant increase if its weight.

Owing to these twin factors, the farmer reaped a bountiful harvest. Besides boric acid (17% B), borax (11% B) or 'Solubor' (20% B) can also be used to prepare the spray solution for this purpose. Adding urea as an adjuvant at 1% concentration to the spray solution improves the absorption of boron by leaves. This technology is highly cost-effective and can be adopted in all cucurbitaceous crops in areas known to be endemic for boron deficiency.

Shri Badradev Mumar of Muthkur, North Bangalore reaped a bountiful harvest of ash gourd (left) by adopting foliar application of boron

In 'Arka Bahar' bottle gourd grown at IIHR, Hessaraghatta the fruit yield increased by 50% due to foliar spray of boric acid (25ppm) with urea (0.5%) compared to the unsprayed 'control'.