

Influence of Application Variables on Efficacy of Boron-Containing Fertilizers Applied to Peanut (*Arachis hypogaea* L.)

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Several formulations of the essential element boron (B) are commercially available for application to peanut (*Arachis hypogaea* L.) and other crops. Research was conducted in North Carolina to compare accumulation of B in peanut leaves, stems, and pods following application of water soluble disodium octaborate with 17.5% B (Solubor®) and boric acid with 17.5% B (Boric Acid™) and liquid B formulations including 3.3% B and 4.5% nitrogen (N) (N-Boron™), 5.0% B (Boron Xtra©), and 9% B (Nutrisol 9% Boron™). Research was also conducted to determine if efficacy of clethodim, imazapic, imazethapyr, sethoxydim, and 2,4-DB was affected by these B formulations when applied in mixture. The influence of these herbicides on B accumulation in peanut leaves was also compared with disodium octaborate. Accumulation of B in leaves and stems was primarily a reflection of the amount of actual elemental B applied per ha rather than differences in formulation. The highest concentration of B in leaves and stems was noted after application of disodium octaborate (17.5% B) compared with the liquid formulations containing 3.3% B or 5.0% B. However, accumulation of B in peanut seed did not differ from non-treated peanut regardless of B formulation. Accumulation of B was similar when B was applied as disodium octaborate and boric acid, and accumulation following application of these formulations exceeded B concentration in non-treated peanut. Accumulation of B was similar for the liquid 9% B formulation and boric acid. Accumulation of B for the liquid 9% B formulation did not differ from non-treated peanut. Boron formulation did not affect sicklepod [*Senna obtusifolia* (L.) Irwin and Barneby] control by imazapic and 2,4-DB or large crabgrass [*Digitaria sanguinalis* (L.) Scop.] control by clethodim and sethoxydim. However, Palmer amaranth [*Amaranthus palmeri* (S.) Wats.] was controlled less by imazethapyr when applied with disodium octaborate compared with imazethapyr applied without B or with other B formulations. Although differences in B accumulation were noted among herbicide treatments, presence of adjuvant was the most important variable in defining response. Boron accumulation in leaf tissue increased when disodium octaborate was applied with crop oil concentrate or nonionic surfactant compared to application without adjuvant. Boron accumulation was similar when disodium octaborate was applied with azoxystrobin, chlorothalonil, pyraclostrobin, and tebuconazole, and with the exception of pyraclostrobin, B accumulation was similar when comparing B alone or with these fungicides mixed with lambda cyhalothrin. Boron accumulation was higher when B was applied with pyraclostrobin compared with B plus lambda cyhalothrin either alone or with the fungicides chlorothalonil, pyraclostrobin, or tebuconazole. Boron did not affect peanut defoliation caused by late leaf spot [*Cercosporidium personatum* (Berk et Curt.) Deighton] when comparing efficacy of azoxystrobin, chlorothalonil, pyraclostrobin, and tebuconazole applied alone or with B.

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