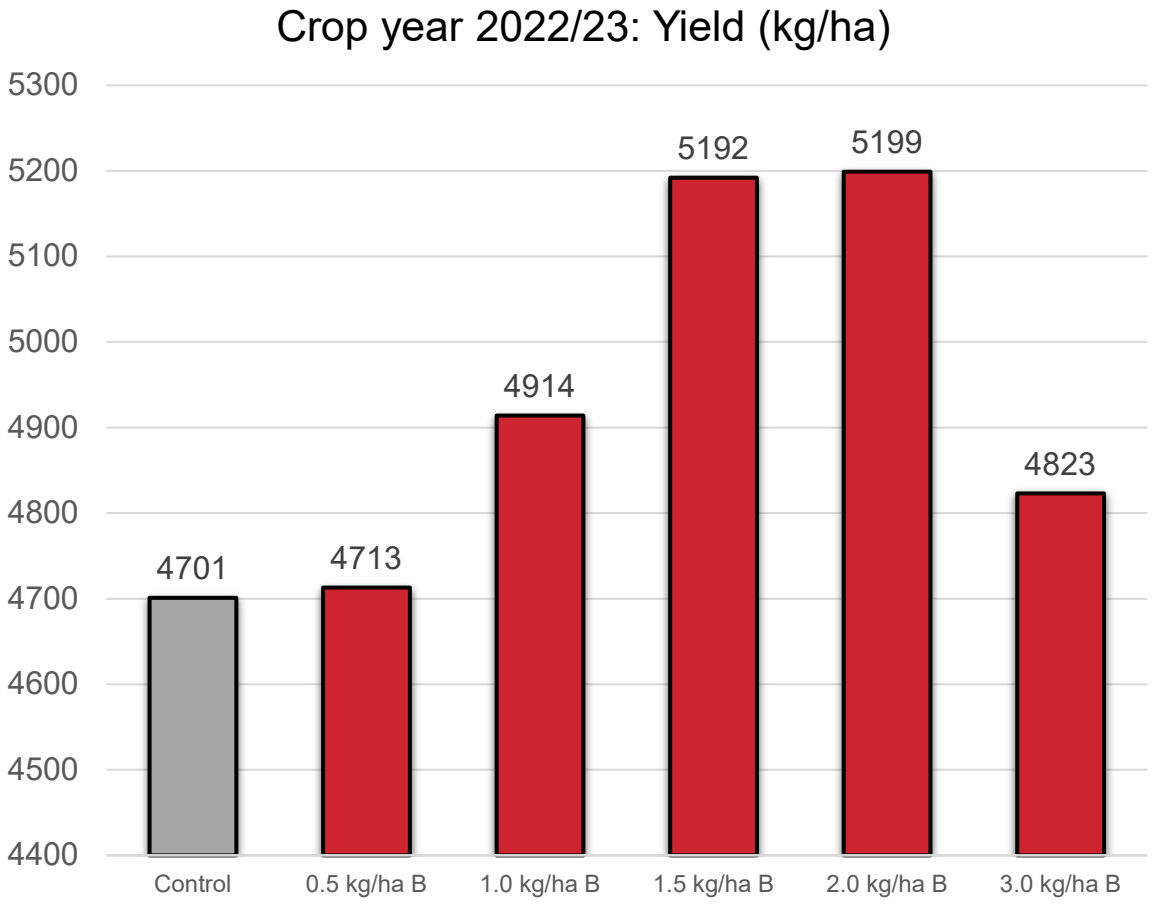
Boron in soybean

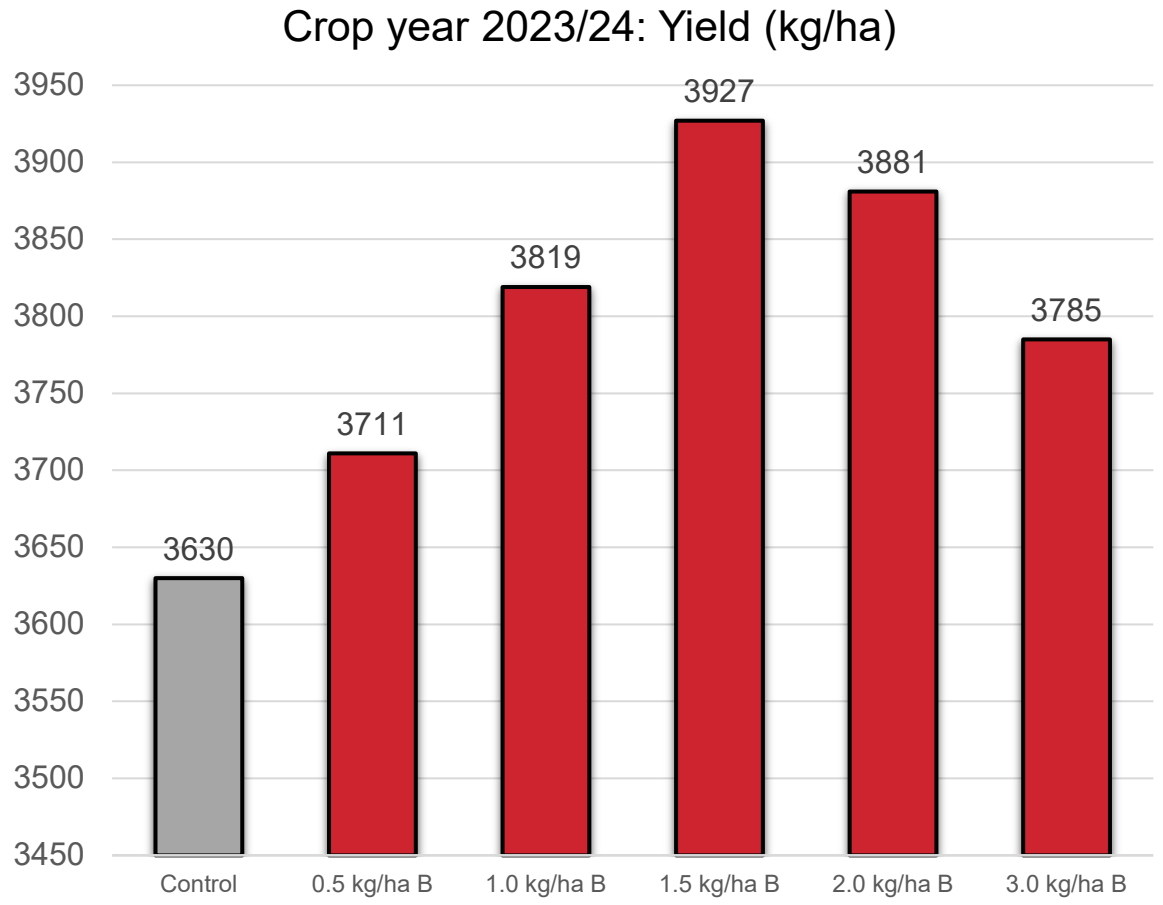
Study details

Research institution: NEMABIO, Agronomic Research
Researcher: Dr. Claudinei Kappes
Date: 2022/23 and 2023/24
Location: Sinop, MT – Brazil
Crop variety: BMX Bônus IPRO
Soil: Dystrophic Red-Yellow Latosol (Oxisol)
Clay 40.8%, Sand 51.0%, Silt 8.2%
Soil pH: 4.9 ($CaCl_2$)
Additional soil information: OM 19.6 g/dm^3; P 9.6 mg/dm^3; K 34.5 mg/dm^3; S 16 mg/dm^3;
Ca 2.1 cmol$_c$/dm^3; Mg 0.6 cmol$_c$/dm^3; B 0.14 mg/dm^3; Cu 1.5 mg/dm^3;
Mn 2.0 mg/dm^3; Zn 5.1 mg/dm^3; and Fe 37 mg/dm^3
Fertilizer: *Granubor*®
Trial design: Randomized complete block with four repetitions
Metrics: Yield (kg/ha), B content in the leaves, and B content in the soil (after harvest).
Plant stand evaluation to ensure consistent stand in each replication

Boron in soybean



Source: C. Kappes, 2023



Source: C. Kappes, 2024

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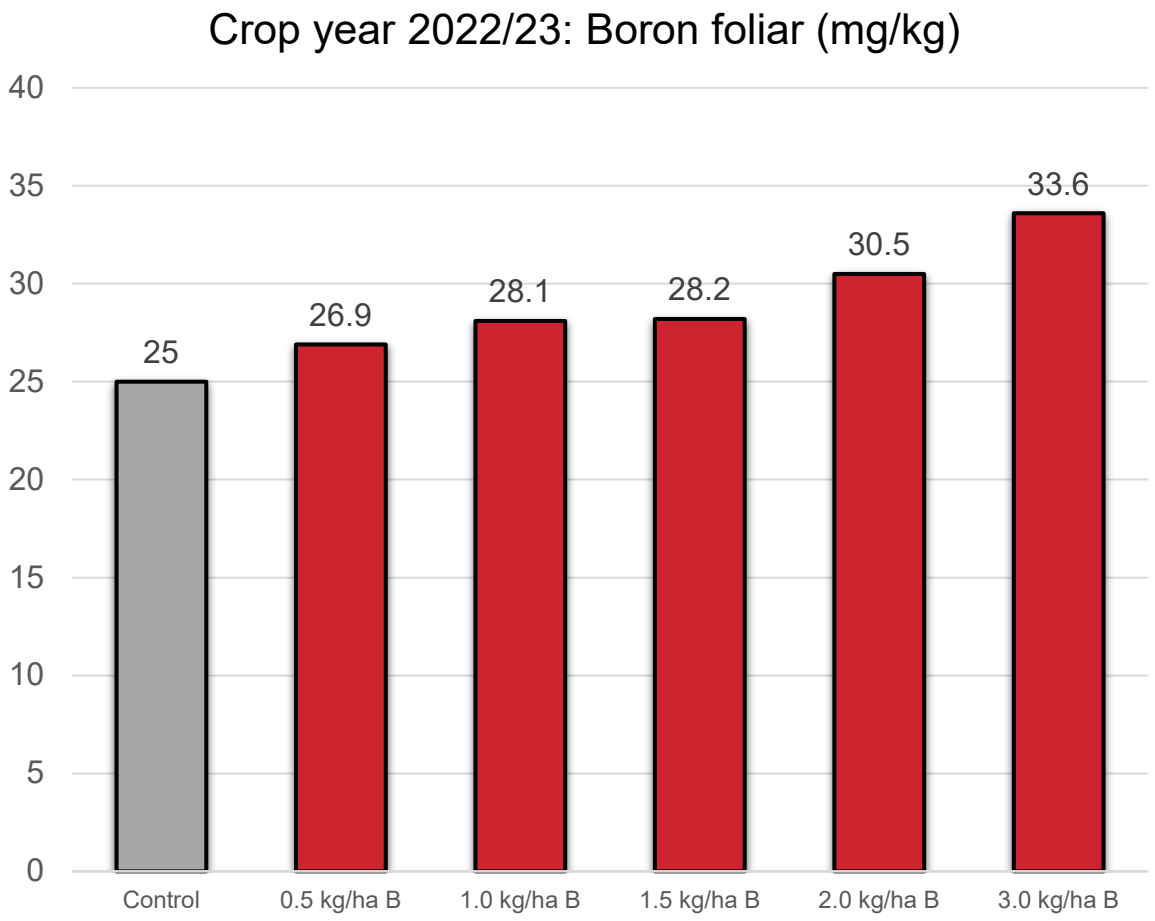

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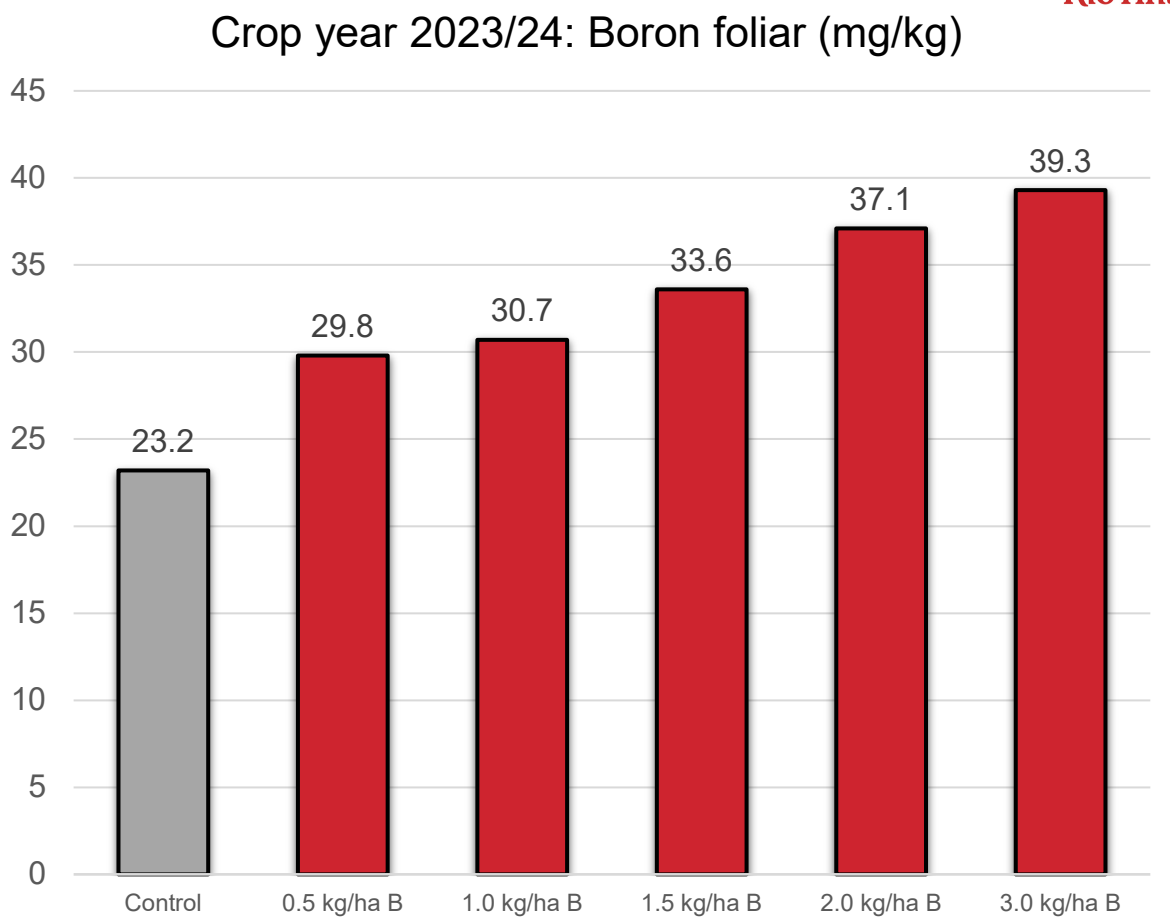

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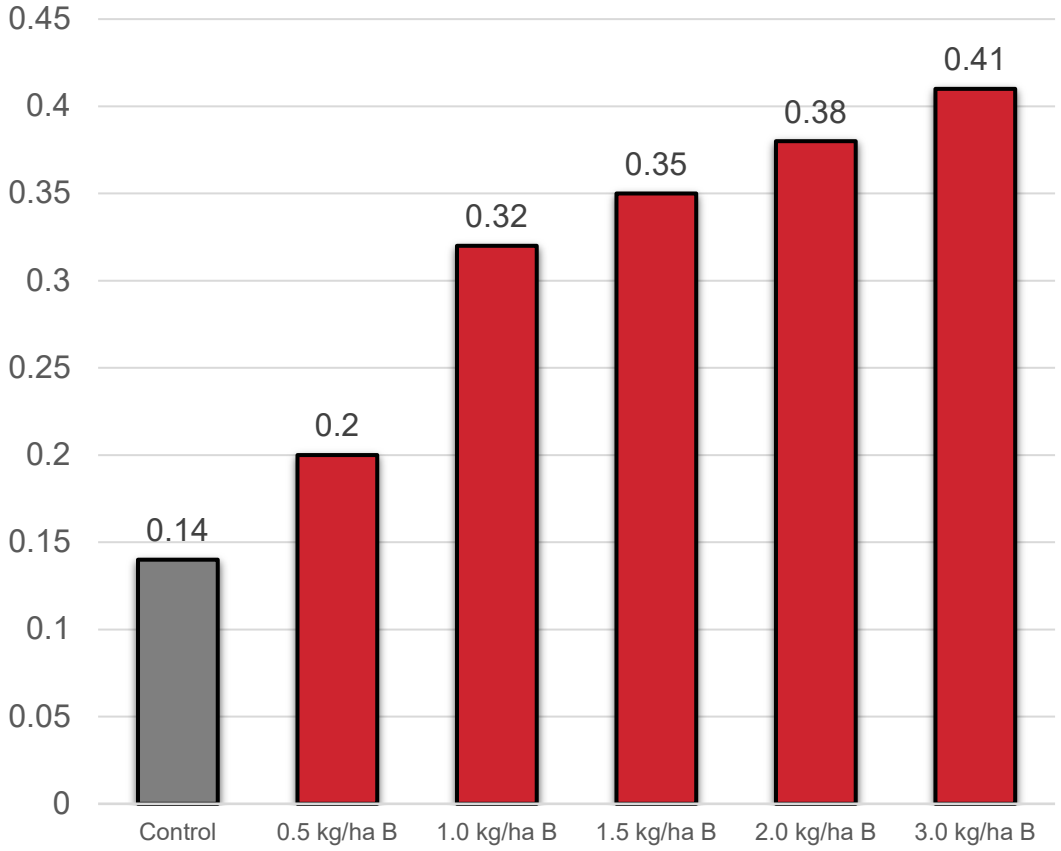

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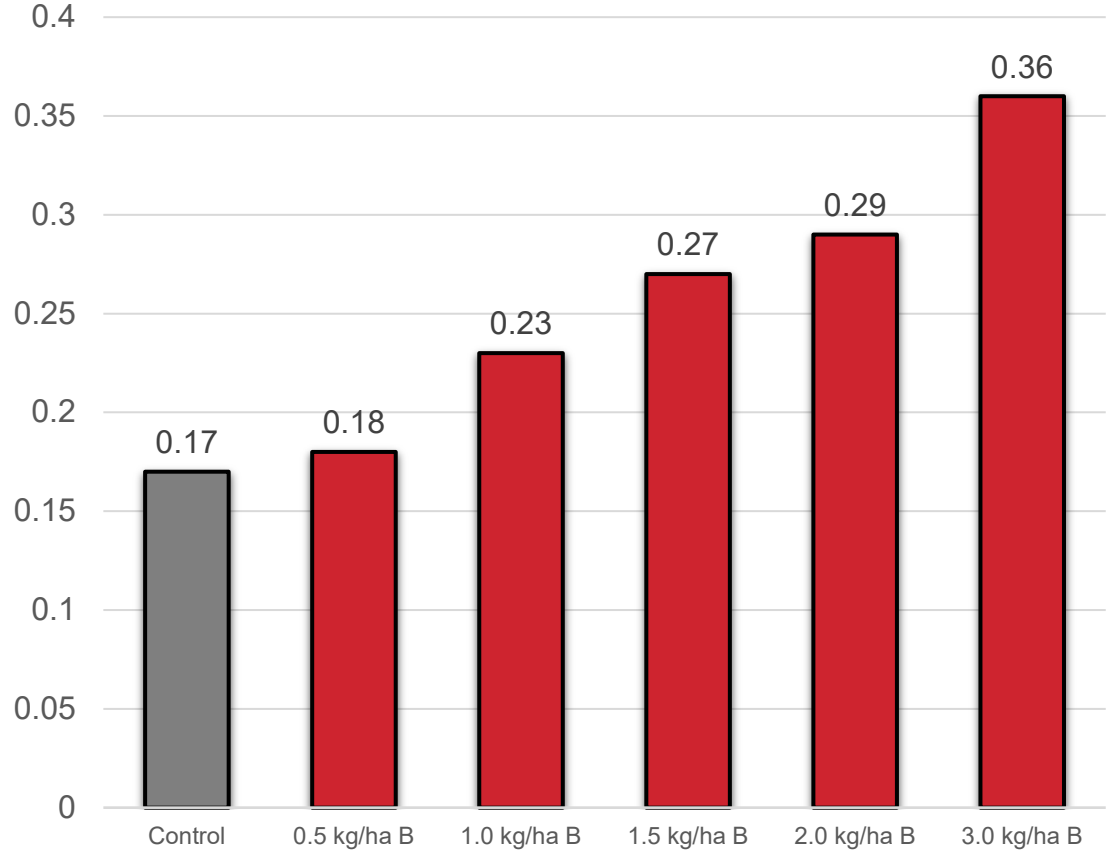

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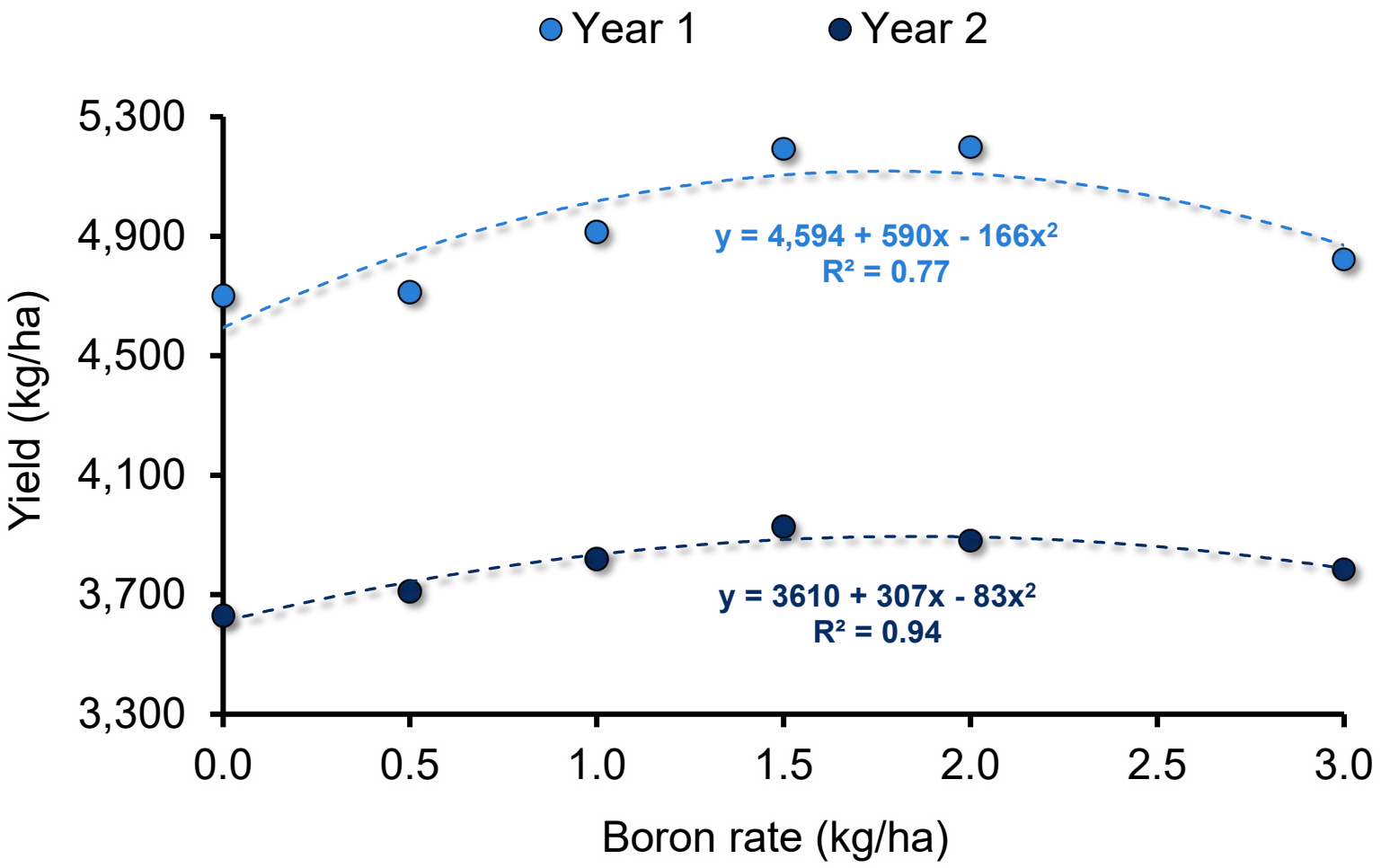

Dystrophic Red-Yellow Latosol
(Oxisol)

Soil information (0-20 cm)	
B	0.16 mg/dm³
pH $CaCl_2$	4.9
Organic matter	1.96%
Clay	41%

GRANUBOR®

Source: C. Kappes (2024)

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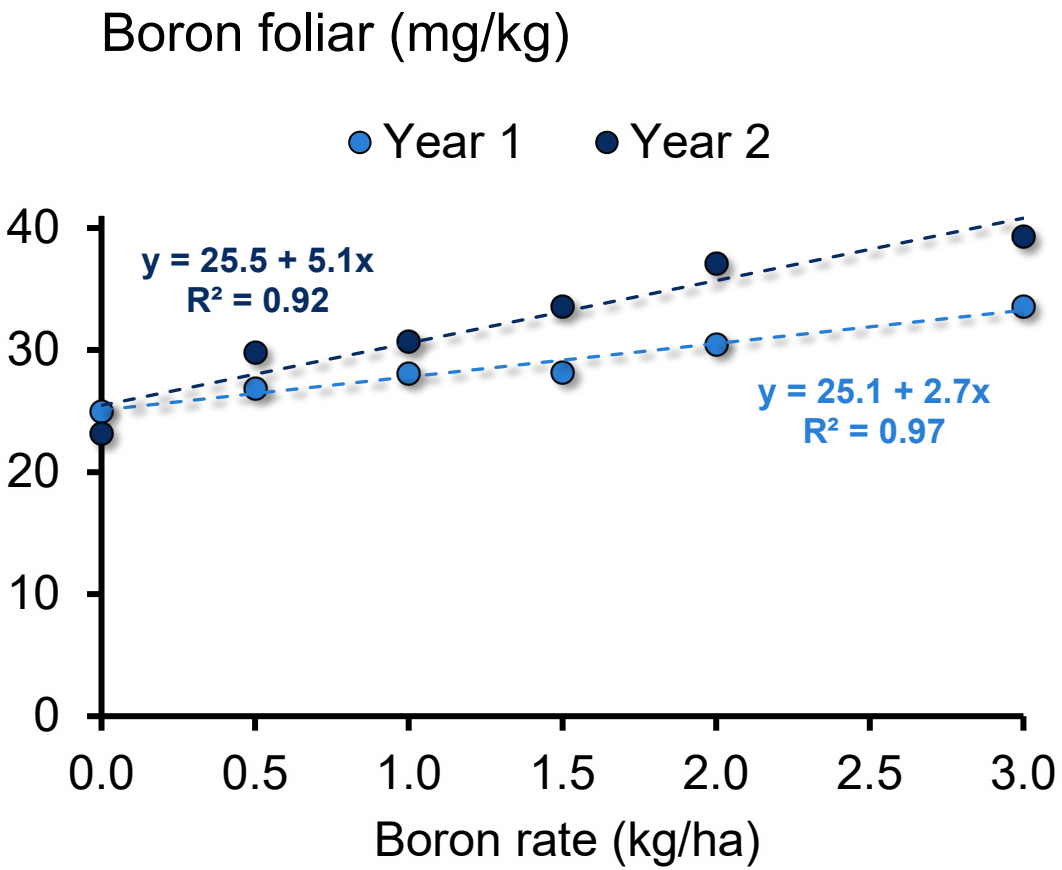

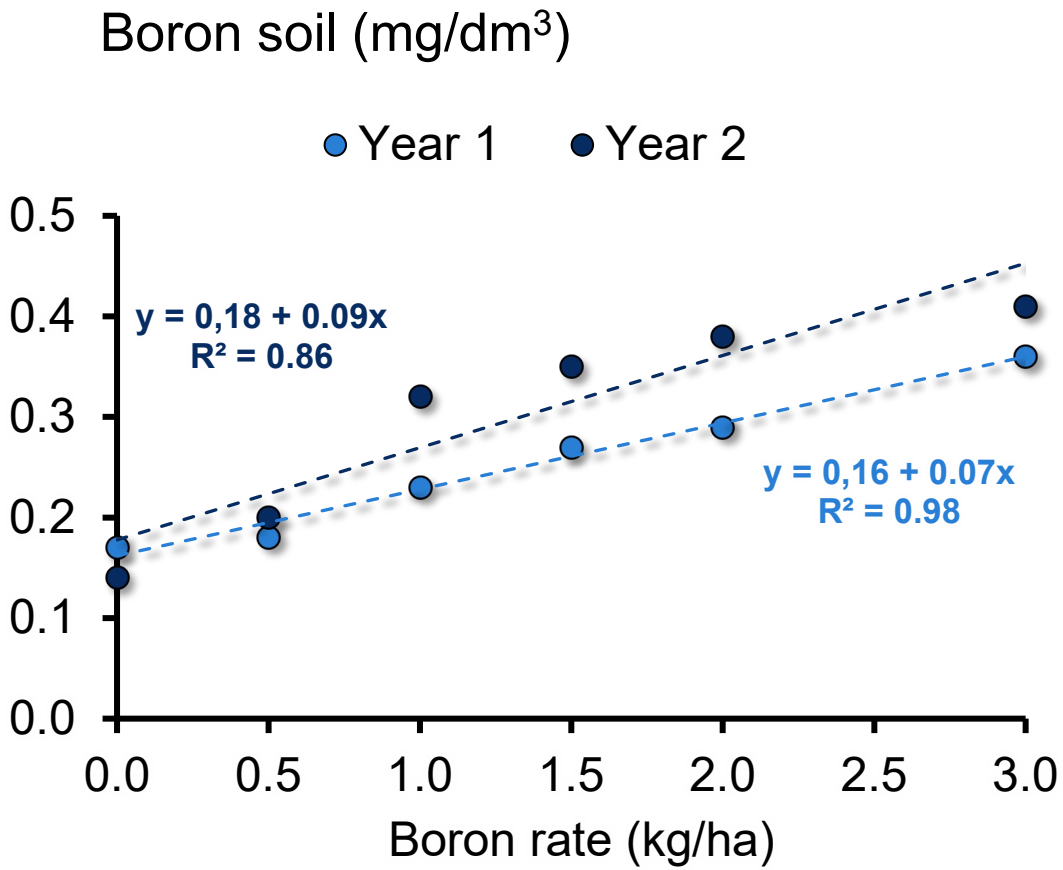

Source: C. Kappes (2024).

Boron in soybean: Results

In this field experiment, conducted in Santa Carmem, MT – Brazil, during two consecutive crop seasons (2022/2023 and 2023/2024), it was possible to verify the importance of the element boron (B) for obtaining high soybean yields. The study was conducted in clayey soil, cultivated in the “safrinha” soybean-corn system for more than 15 years in a no-tillage soil system. The source of B used was *Granubor* (15% B), which was applied at the time of sowing.

The results obtained allow us to conclude that:

1. Applications of 2.0 and 1.5 kg/ha of boron via *Granubor* in the first and second crop season of the study provided higher soybean yields, with increases of 498 and 294 kg/ha compared to the control treatment, respectively

2. In both crop seasons, the application of increasing doses of B linearly increased the levels of the element in the leaf (blooming flowers) and in the soil, where the lowest values were verified in the treatment that did not receive its application

3. Visual symptoms of B toxicity in seedlings were observed at the highest dose (3.0 kg/ha B). However, this was considered to be of “mild” intensity, since the symptoms were restricted to the unifoliate leaves, ie, there was no persistence of symptoms over time and no harm to plant development.