

# Boron in corn and soybeans



## Corn and soybeans require adequate levels of boron to ensure maximum economic yields

### Corn

Corn removes significant amounts of boron from the soil each year. In high yield situations, boron fertilization becomes critically important.

Boron is necessary for:

- Stimulation of root and shoot development
- Membrane cell integrity and functioning
- Transport of sugars from leaves to ears
- Pollen germination
- Pollen tube growth and seed formation
- Better water use efficiency and drought tolerance

### Timing your boron application

- Boron may be applied in dry bulk blended fertilizer, broadcast before planting, using *Granubor*<sup>®</sup>.
- Liquid boron fertilizers may be applied broadcast before planting, banded at planting, or sidedressed, using *Fertibor*<sup>®</sup> in suspensions.
- Boron in liquid fertilizers may be broadcast before planting, banded at planting, sidedressed, or fertigated, using *Solubor*<sup>®</sup>.
- Boron for high-yield, irrigated corn may be applied most conveniently through the irrigation system as *Solubor* 4-6 weeks after emergence in 2 applications up to 1 lb each.
- Never apply boron in direct contact with the seed.

### Soybeans

Boron fertilization of soybeans has been shown to increase grain yield at many locations in several states.

Boron is necessary for:

- Stimulation of root growth
- Increased root nodule development for nitrogen fixation
- Increased branching and flowering
- Increased bloom retention
- Increased number of pods
- Better seed development and grain yield

### Timing your boron application

- Boron may be applied in dry or fluid blends. With dry bulk blend fertilizer, broadcasting before planting is recommended, using *Granubor*.
- Boron in liquid suspensions may be applied broadcast before planting, banded at planting, or sidedressed, using *Fertibor* in suspensions.
- Boron in liquid fertilizers may be broadcast before planting, banded at planting, sidedressed, or fertigated using *Solubor*. Liquid boron fertilizer can be foliarly applied alone or tank mixed with pesticides.\*

\*Foliar sprays should not exceed 0.5 lbs/acre boron per application. Fertigation allows timely split applications of boron when it is needed by the crop and minimizes leaching. Drip irrigation allows incremental applications of 0.1 to 0.25 lbs/acre boron through the drip system. The total amount of boron added in foliar sprays or split applications should not exceed the total broadcast recommendations.

# BROCHURE: BORON IN CORN AND SOYBEANS

## Quality is more important than quantity

Boron is a naturally occurring mineral. But refinement and quality control are necessary to provide a source that can:

- Mix well with other nutrients
- Dissolve completely in liquid applications
- Enable uniform application
- Provide maximum availability to crops

Subpar products might cost less up front, but high-quality refined boron is cost competitive when evaluated on a price-per-useable-kilogram basis.

## Low-quality boron can do more harm than good

Not all borate products produce the same quality or level of useable boron. When it comes to boron, product price is not always the best measure of true return on investment (ROI). A less expensive product can end up costing more over the long term if you need to purchase and apply more of it.

## Corn fertilization

Recommended pounds of boron per acre per year

| Yield goal<br>bu/acre | Application methods                 | Boron soil test rating |        |      |
|-----------------------|-------------------------------------|------------------------|--------|------|
|                       |                                     | Low                    | Medium | High |
| 100 - 149             | Broadcast preplant                  | 1.0                    | 0.25   | 0    |
|                       | Band at planting <sup>1</sup>       | 0.25                   | 0.25   | 0    |
|                       | Sidedress                           | 1.0                    | 1.0    | 0    |
| 150 - 200             | Broadcast preplant                  | 1.0                    | 0.5    | 0    |
|                       | Band at planting <sup>1</sup>       | 0.25                   | 0.5    | 0    |
|                       | Sidedress                           | 1.0                    | 1.0    | 0    |
| > 200                 | Broadcast preplant                  | 2.0                    | 2.0    | 0    |
|                       | Band at planting <sup>1</sup>       | 0.5                    | 0.5    | 0    |
|                       | Sidedress or fertigate <sup>2</sup> | 2.0                    | 2.0    | 0    |

<sup>1</sup>Banding at planting is more efficient than broadcast.

<sup>2</sup>Split applications are recommended. Do not exceed 2 lbs of total applied B/acre per year.

## Soybean fertilization

Recommended pounds of boron per acre per year

| Yield goal<br>bu/acre | Application methods <sup>3</sup>    | Boron soil test rating |        |      |
|-----------------------|-------------------------------------|------------------------|--------|------|
|                       |                                     | Low                    | Medium | High |
| < 30                  | Broadcast preplant <sup>2</sup>     | 1.0                    | 0      | 0    |
|                       | Band at planting <sup>1</sup>       | 0.25                   | 0      | 0    |
|                       | Sidedress                           | 0.25                   | 0      | 0    |
|                       | Foliar <sup>3</sup>                 | 0.25                   | 0      | 0    |
| 30 - 45               | Broadcast preplant <sup>2</sup>     | 1.0                    | 0      | 0    |
|                       | Band at planting                    | 0.25                   | 0.25   | 0    |
|                       | Sidedress                           | 0.50                   | 0.50   | 0    |
|                       | Foliar <sup>3</sup>                 | 0.25                   | 0.25   | 0    |
| > 45                  | Broadcast preplant <sup>2</sup>     | 1.0                    | 1.0    | 0    |
|                       | Band at planting <sup>1</sup>       | 0.25                   | 0.25   | 0    |
|                       | Sidedress or fertigate <sup>2</sup> | 0.50                   | 0.50   | 0    |
|                       | Foliar <sup>3</sup>                 | 0.25                   | 0.25   | 0.25 |

<sup>1</sup>Boron banded 2 in. beside and 2 in. below seed row at planting, foliar, and sidedressed boron are all more efficient methods than broadcast before planting.

<sup>2</sup>If soil is limed just before planting, increase preplant broadcast boron to 2 lbs per acre.

<sup>3</sup>Foliar applications may be repeated up to a total of 0.5 lbs per acre boron. Do not exceed 1 lb per acre total boron application by any combination of methods unless lime is applied just before planting.

## About U.S. Borax

U.S. Borax, part of Rio Tinto, is a global leader in the supply and science of borates—naturally-occurring minerals containing boron and other elements. We are 1,000 people serving 650 customers with more than 1,800 delivery locations globally. We supply around 30% of the world's need for refined borates from our worldclass mine in Boron, California, about 100 miles northeast of Los Angeles.

Our local agriculture experts understand the uses and benefits of boron on crops. In addition to a global sales team, we have a number of agronomists on staff to help fertilizer distributors maximize the benefits of borates in agriculture applications. Our ag team can answer individual growers' questions and concerns about their particular crop.

High quality, high reliability, high performance borate products. It's what we're known for.

