Boron has no impact, so they say!

Know Your Nutrients
Doug Grandel, Mar 26, 2019

Boron (B) plays a key role in a wide range of physiological processes that allow plants to germinate, grow, reproduce and remain healthy. No wonder it's the first nutrient that plants seek!

Boron is critical to the growth of pollen tubes, germination of pollen grains and fertilization, and helps to ensure good grain fill. A deficiency can cause reduced pollen tube growth and flowering, reduced seed set and in canola, which has higher boron requirements than cereal crops, aborted flowers and pod blanks or missing seeds in the pod.

The first step in proactively managing boron is to understand some of the key aspects that lead to boron deficiency, and how to identify and prevent a deficiency to mitigate stress and preserve yield. Read on to learn more about boron and why growers should be paying attention to this important nutrient throughout the growing season.

Boron Availability

Multiple factors affect boron availability. For example, high pH soils, soils that were overly limed and soils that inherently have a high level of calcium or a heavy supply of potassium or nitrogen can have limited boron availability. Sandy soils that are prone to leaching of anions such as boron, or soils with low organic matter also have the tendency to be low on boron.

Being mobile in the soil and hardly mobile in most plants (except for crops able to produce polyols, such as apples) and being translocated through mass flow, boron availability is weather dependent. Deficiency can then be triggered by environmental conditions even if boron soil levels are sufficient at the start of the season. For example, cold, wet or hot and dry conditions can tremendously reduce the availability of the boron and create a transient shortage, especially at flowering time for canola, wheat, pulses and many other flowering crops across the Prairies.

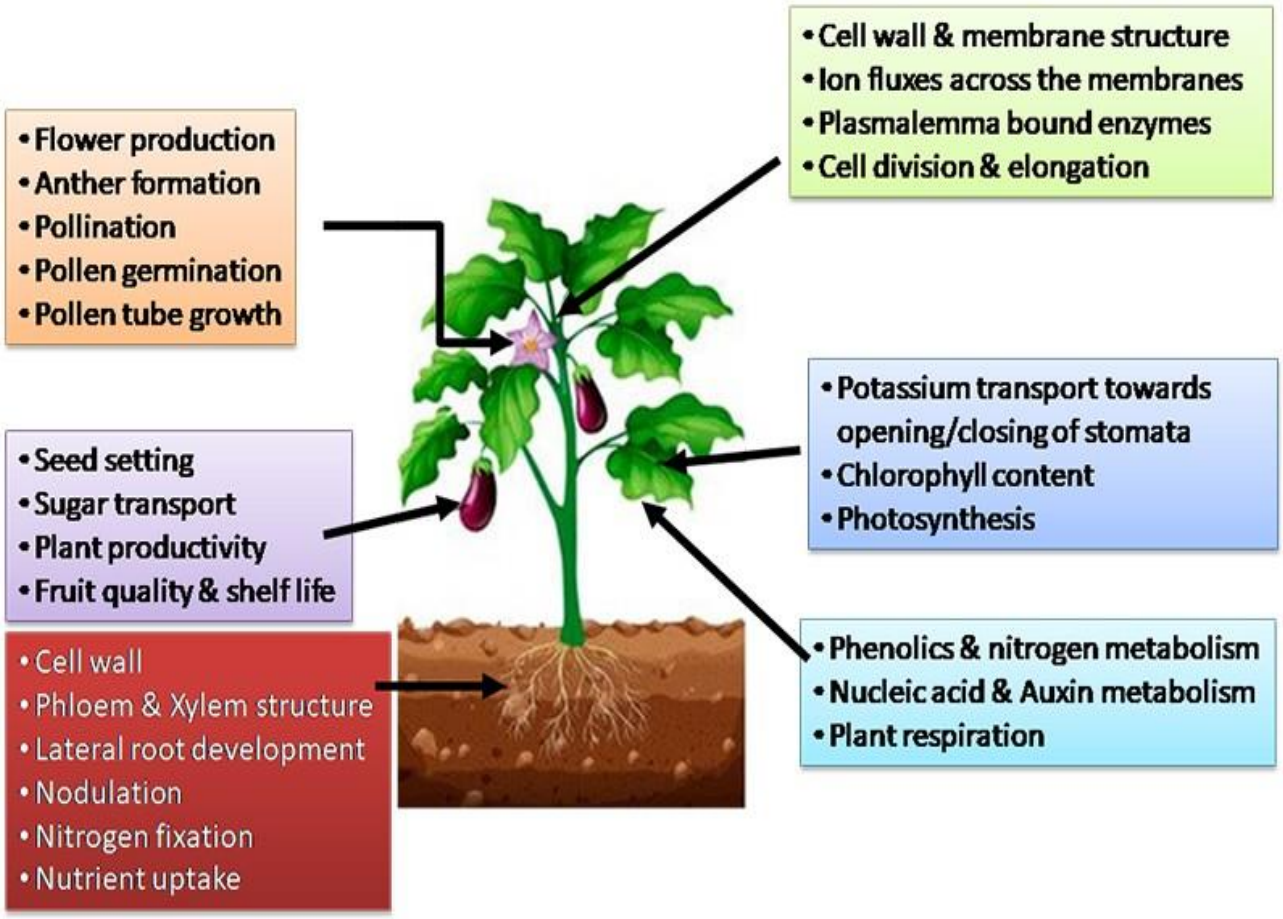

Fig. 1 Boron functions in plants.

Boron Deficiency

Most farmers and agronomists are aware of or have seen symptoms of boron deficiency in their canola or pea crops; but, surprisingly, an increased number of wheat crops across the Prairies have been showing symptoms of boron deficiency over the past few years, as well.

A boron deficiency can present a variety of tell-tale symptoms including thick, curled, brittle leaves; death of growing points; the formation of multiple side shoots; reduced pollen tube growth and flowering; seed and pod abortion; and a reduced seed set.

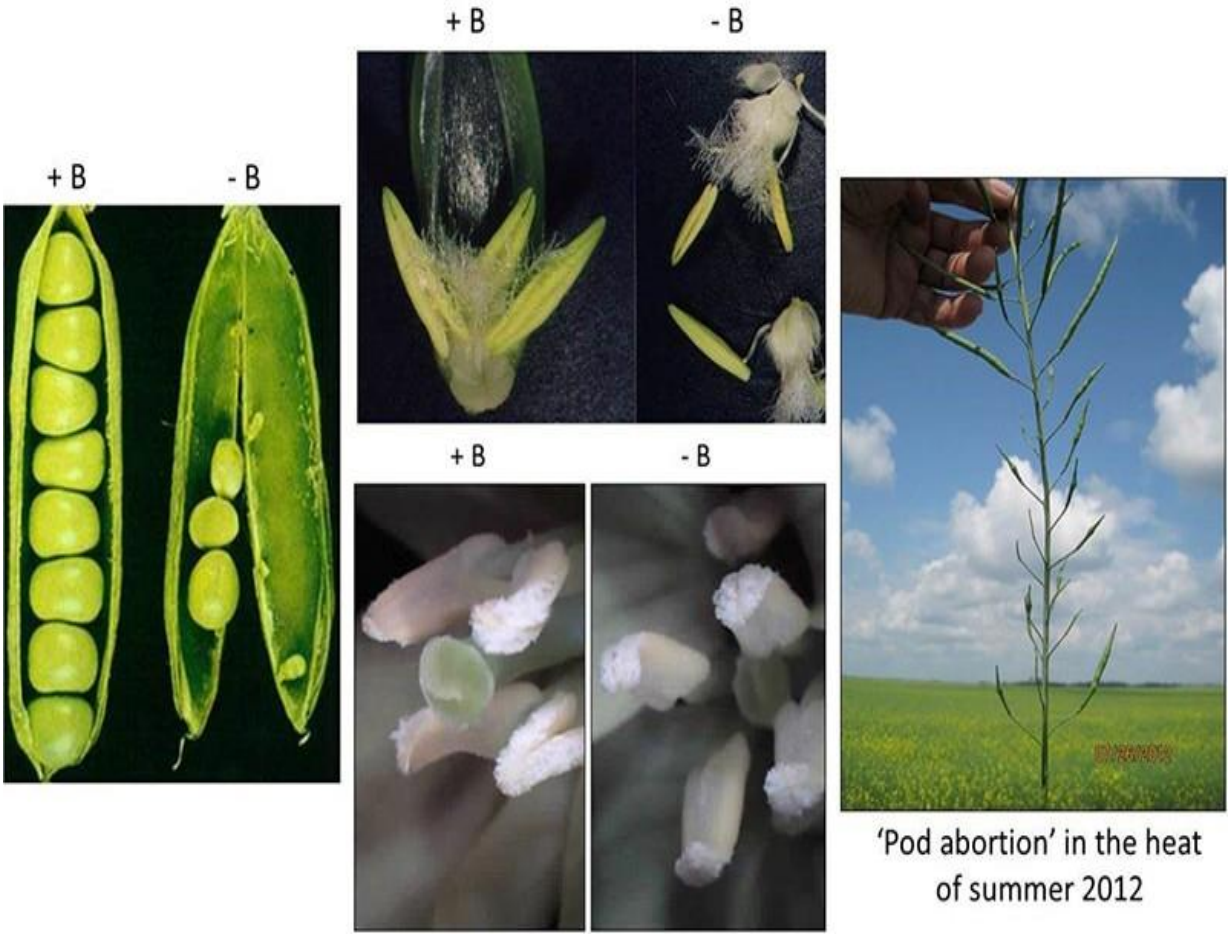

Fig. 2 Boron deficiency in wheat, canola and peas at flowering and pod filling time (aka pod abortion or heat blast).

As boron affects flower development and pollen viability, the number of grains in each wheat ear is reduced. By the time the farmer sees the symptoms, it may be too late to correct them and preserve the yield.

The signs of boron deficiency in cereals and wheat include:

- Deformed, distorted growing points
- Distorted young leaves, which may die off if the deficiency is severe
- Ears that appear short and have blind grain sites

Note: Low boron levels in the soil exacerbate the deficiency symptoms.

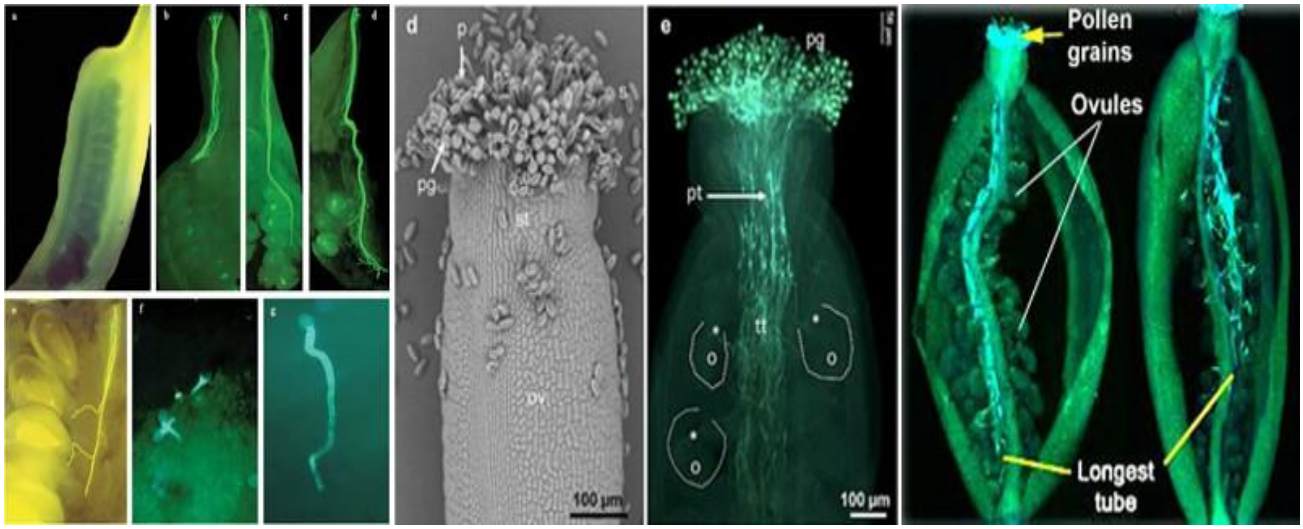

Fig. 3 Germination and elongation of pollen tubes to reach the ovules, which is a process driven by boron and calcium.

In all crops, the germination of pollen grains and the elongation of pollen tubes highly depend on the availability of boron and calcium. A lack of boron and calcium results in seed abortion – especially when the environmental conditions are not conducive to the uptake of either nutrient.

Growers can help prevent seed and flower abortion, with a timely supplementation of boron (and calcium) during the peak of flowering.

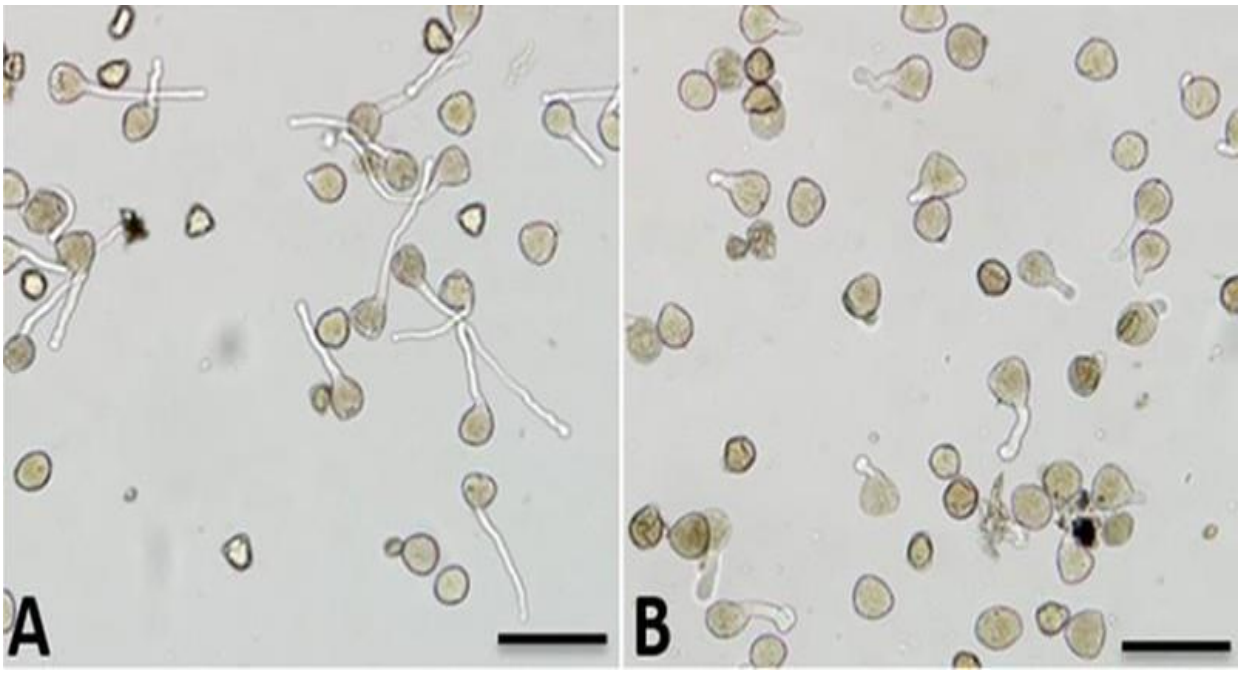

Fig. 4: Germination of pollen grains in presence (A) and absence (B) of boron.

TABLE 1. POLLEN TUBE LENGTH (µM) IN PRESENCE (+B) OR ABSENCE (-B) OF BORON.		
	+B	-B
Canola	265.3 (±53)	127.8 (±61)
Wheat	121.2 (±20)	60.8 (±15)
Corn	459.1 (±64)	132.0 (±28)
Peas	266.7 (±39)	151.4 (±47)
Soybeans	235.6 (±34)	104.1 (±17)

OMEX® Has the Solution

OMEX® offers a wide variety of solutions, foliar fertilizers, to proactively address boron deficiency throughout the growing season.

At the outset of the season, boron can be included at burn-off or in-furrow with the starter fertilizer; **Cell Power® SizeN® Ca +.2%,** for example.

In-season, liquid foliar fertilizers **Cell Power® Calcium 9 + B, Cell Power® TruBoost and Cell Power® Boron-Zinc** provide the most available form of boron (boric acid) to correct deficiency or supplement boron during peak demand. can also be combined with **Cell Power® SizeN® Ca, Calcium 9 + B, Cell Power® TruBoost and Cell Power® Boron-Zinc** to encourage healing and recovery from hail or insect damages.

Talk to your retailer or **OMEX® sales representative** about how to incorporate boron into your fertility programming. Your **OMEX®** rep can provide you with a guided nutrient management strategy for the growing season that includes timely applications of boron to prevent deficiency, mitigate stress, and preserve yield and quality of your crop.

grow with OMEX®

Quality & Crop Safety is our #1 Goal

For more information on products please contact OMEX® Agrifluids at OmexUSA@Omex.com or call 559-661-6138.