

## Crop Production Planner

## Corn

A range of elements influence corn yield. Soil condition, weather, fertility, hybrid selection, weeds and insects all play a major role in yield potential. History has dictated that a sound agronomic plan encompassing good crop rotation and a good fertility program will continually yield the best returns. Seed placement and timing is critical when striving to achieve high corn yields. Early planting is important. In most cases, growers are aware that the earlier the corn is in the ground, the better the yield potential. With earlier plantings and the trend to no-till or reduced tillage practices, cooler soil temperatures have increased the need for improved management. A good crop production plan can help growers achieve or exceed yield goals.

***Improve your payback odds.....corn starters are the key to maximizing corn yields.***

Carefully review soil samples, field history, new hybrid characteristics, potential disease, weed and insect pressures when designing your production plans for corn.

**Nitrogen:** Corn requires large amounts of N to achieve yield goals. N is the primary component of protein development and is necessary for chlorophyll production. Nitrogen management techniques vary across the province. This is primarily due to yield potential, total N applied, soil type and N holding capacity of the soil. A corn plant uses most of its N after the corn is in the reproductive stage. Only about 25% of its total needs are required in the first 30 days. Although sidedress application when the corn is in the 5 leaf stage is the most efficient timing of N, remember that weather and field conditions may not allow us in the field at the correct crop stage. In order not to short the crop of any nitrogen ensure that more than 25% of total N required is applied preplant or preemerge.

***The ammonium form of nitrogen helps stimulate the uptake of phosphorous, especially in high pH soils, due to the resulting acidity as ammonium-N is nitrified to Nitrate-N. Ammonium sulphate is beneficial to corn in starter blends because it provides this acidulation effect***

Rule of Thumb: Apply 1.5 lbs of N for every bushel of yield goal. (- soil N +/- residue N )

**Phosphorus:** Phosphorous plays a role in photosynthesis, respiration, cell division & enlargement and several other processes in the living plant. The corn plant benefits from P because it helps roots and seedlings develop more rapidly. Placement of P is essential because of its affinity to chemically bond with other elements. Starters banded 2x2 put the nutrients that emerging corn needs where and when it needs them. ***As weather patterns don't always provide soil available P to the growing seedling, phosphorous should be recommended in all starters. Note that even when soil test levels are high, positive yield responses are achieved when phosphorous is included in starter blends.***

**Potassium:** Potash is vital for plant growth, as it controls the stomatal openings of the leaf pores. Good levels of potassium in the soil will build stronger stalks and improve lodging

resistance. Adequate potassium levels will help ensure a thick cuticle and epidermis layer to help combat disease and insect pressure. Limit the amount of potassium chloride in the planter to prevent burning off young roots that are required to take up nutrients.

***An alternative source of K in starters is Kmag, which provides a premium source of potassium sulphate. Kmag is a 100% water soluble form of potassium, providing immediate availability of K, Mg and S to corn seedling roots.***

**Sulphur:** A balanced fertility program for a corn crop should include S as a means to improve nitrogen efficiency. Sulphur is taken up into the plant as sulphate ( S<sub>04</sub> -). Ammonium Sulphate and Kmag products are both excellent sources of sulphate fertilizers, providing immediate availability of sulphur. Tiger 90 is a granular sulphur fertilizer that can also be included in starter mixes. The rate at which elemental sulphur converts to the sulphate form is dependent upon oxidation rates. Normal temperature and moisture conditions will supply the plant with timed release throughout the season. ***Both Ammonium Sulphate and Tiger 90 elemental S, have acidifying tendencies. This is beneficial under alkaline soil conditions, where it positively influences the availability of other nutrients.***

**Magnesium:** Magnesium is the main element required in the production of chlorophyll. Corn will benefit from Mg in the starter mix when: Mg levels are low and / or the K:Mg base saturation ratio is out of balance. The ideal K:Mg ratio is 0.30 to 0.40.

***Good corn starter products to use are Kmag which will help satisfy K and S requirements as well or Magnesium Sulphate where Mg is primary nutrient required.***

**Zinc:** The primary function of Zinc in corn starters is to ensure early emergence and good leaf area. It acts as a catalyst for the function of many enzyme systems. Because Ontario conditions force many growers to plant early into cooler, wetter soil conditions, zinc should always be included in corn starter mixes. Several Zinc products and formulations are available in the marketplace today and all have been utilized with varying degrees of success. My recommendation is the Agrico NSCorn Mix, an acidulated homogeneous blend of N, S, B, Mn and Zinc. ***Ensure 1 lb of Zn is included for every 15 lbs of phosphorus placed in the planter mix.***

**The maximum number of kernels-per-ear harvested is determined by the 6 leaf growth stage of corn and is directly impacted by the starter fertilizer. Recommending a balanced starter is one very important part of a sound crop production planner.**

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