

## CONVENTIONAL OR ORGANIC FERTILIZER?

#3 IN A SERIES OF 3

To ensure that soil has the right nutrients and the right balance of nutrients for growing a particular crop, farmers add nutrients or fertilizers.

**Conventional** or **synthetic fertilizers** are created from natural sources of nutrients using manufacturing processes. Conventional fertilizers provide nutrients in a concentrated form that plants can readily use.

Sources of **organic nutrients** include:

- legume (e.g., alfalfa and clover) **cover crops** (crops grown with the main crop to add nutrients and prevent soil erosion)
- animal manure
- compost
- **crop residues** (what's left on a field after a crop is harvested)

Organic nutrients are slowly released as materials decompose. Sources of organic nutrients are often referred to as **organic fertilizers**.

Compost and manure provide additional benefits, such as increasing organic matter which contributes to building healthy soil.<sup>1</sup>

Soybeans grown in nutrient-rich soil



## DID YOU KNOW?

The nutrients used by plants to support healthy growth are the same, whether they come from organic or conventional fertilizers.

## WHY DO FARMERS USE SYNTHETIC FERTILIZER?

With synthetic fertilizers, the exact nutrient content is known and the fertilizer releases nutrients when the plants need it most. This allows farmers to precisely match nutrients with the needs of crops. For example, carrots need a different combination of N, P, K and S compared to beans. Conventional fertilizers allow farmers to give crops appropriate proportions of nutrients, based on science; whereas organic and manure fertilizers are often applied without knowing the appropriate combinations of N, P, K and S.

## HOW FERTILIZERS WORK

Conventional fertilizers usually include nitrogen (N), phosphorus (P), potassium (K), sulfur (S) and sometimes, micronutrients. These nutrients are in a concentrated form readily available to the plant, meaning they do not have to be broken down to be absorbed and used by crops.

Supplying nutrients from organic sources is approximate and therefore less precise. The nutrient content is also low, so a large volume of material needs to be applied to meet plant needs. To achieve the right balance of nutrients, organic sources are often supplemented with conventional fertilizers.

## MORE FOOD

Using conventional fertilizers, farmers today are producing 1/3 more corn than 20 years ago for each pound of nitrogen they apply.<sup>2</sup>






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## Why don't all farmers use nutrients from organic sources?

Farmers often choose to apply conventional fertilizers to crops for several reasons:

- Many farmers do not have access to large supplies of organic nutrients. Some farmers, however, who have livestock will apply animal manure on fields close by and use conventional fertilizers on fields further away.
- Many farmers prefer conventional fertilizers because they can apply the most effective and efficient balance of nutrients for growing crops.
- Organic nutrient sources are slow release. This means the supply of nutrients from organic sources depends on the rate of decomposition of the organic material.<sup>3</sup> Therefore, the timing of nutrient availability to the growing plant is not predictable and may not match the crop needs.



Seed and fertilizer are planted in the soil by seeding equipment.

## CAN YOU APPLY TOO MANY NUTRIENTS?

Yes. Whether they are using conventional or organic sources, farmers must be careful to not apply too many nutrients. Adding more nutrients than needed by a crop does not make the crop produce more food. In fact, applying too many nutrients can damage crops. It is also a waste of money.


If not applied correctly, any nutrient that is added to a field can result in runoff into waterways.

## SUSTAINABLE AGRICULTURE


**Sustainable agriculture** emphasizes the need to meet growing demands for food production without endangering the natural resources on which agriculture depends. Agricultural practices that improve social, economic and environmental conditions have positive impacts on world food sustainability.

## FOOD FOR THOUGHT

We will need to grow 60-70% more food to feed nine billion people by the year 2050. In order to achieve that goal, farmers around the world need to adopt sustainable agriculture practices. Continuing to make better and more efficient use of nutrients will help us feed the growing population.<sup>4</sup>



Crops are fertilized at the same time as seed is planted.



Animal manure being applied to field as a source of organic nutrients