

Potato Fertilizer Placement

During the last 40 years the Yara liquid fertilizer placement technique has become accepted as best practice by the UK's leading growers. A controlled supply of nutrient produces both increases in marketable yield and a more even sample size.

Improved Agronomy

The use of ammonium polyphosphates (used in Yara liquid fertilizers), increases the amount of phosphate available to the plant by local acidification. This results in a higher early growth response. It is also known that this early response to applied phosphate increases with the amount of water soluble phosphate available to the plant.

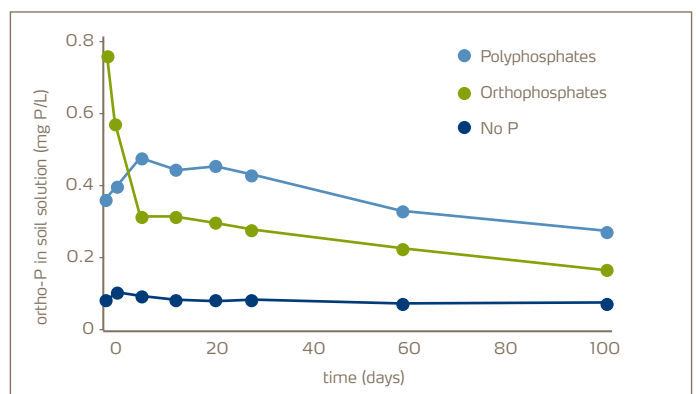
Where fertilizer is broadcast on the soil surface before planting, the mixing of the soil that occurs between fertilizer application and planting results in it being evenly distributed throughout the ridge. Some of the phosphate will inevitably be above the potato seed and some will be in the soil between the beds where it cannot be utilised. This mixing of fertilizer and soil leads to rapid "lock up" of water soluble phosphates. In contrast the placing of fertilizer at least 5cm below and to the side of the seed leads to a high concentration of available phosphate and a slower "lock up".

Polyphosphates

The phosphate source in Yara liquid fertilizers is predominantly ammonium polyphosphates, which enhance the availability of phosphate from soil solution, improving root growth.

Although orthophosphates are immediately available, their availability very quickly reduces over time due to precipitation and fixation. Phosphate applied in the polyphosphate form is hydrolysed to orthophosphate increasing the P concentration in soil solution over a greater period of time than where orthophosphate alone was applied.

Polyphosphates increase P concentration in soil solution

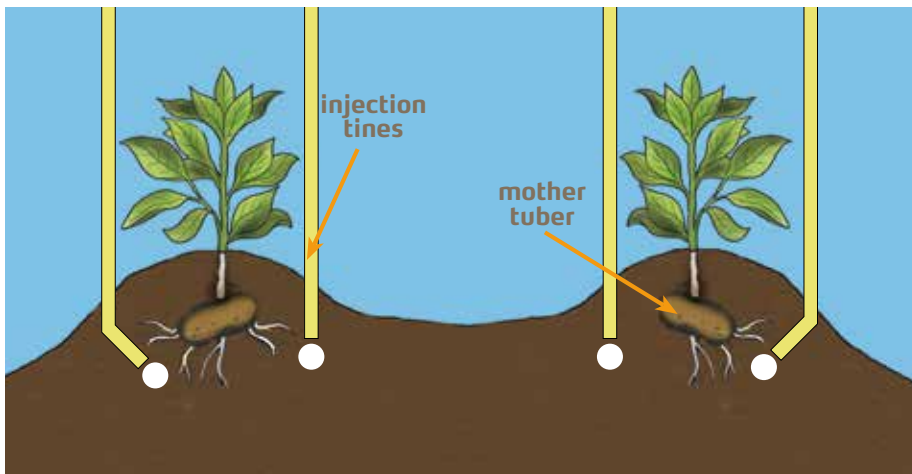


Hydrolysis of polyphosphates establishes higher P concentration in soil solution over a long period of time

Increased Efficiency

Increased concentrations of fertilizer in narrow bands reduces lock-up of phosphate with free cations in soil (eg Ca, Al etc) keeping the phosphate available for plant uptake.

Because the fertilizer is accurately placed below the soil surface into the moist root zone at a controlled distance from the seeds the nutrients are immediately available to the crop even in dry periods, without the risk of scorching.





Other nutrients

Independent research has demonstrated the importance of phosphorus for tuber bulking - the longer it is maintained at a high level in the crop, the greater the yield potential. Yield potential is increased by around 0.5 t/ha for each extra day that the phosphorus level in the petiole is kept above 0.22%. However the level of phosphorus in the petiole peaks at tuber initiation and then declines as the season progresses. The phosphorus level normally reaches 0.22% around 100 to 110 days after planting. Any “premature deficiency” incurs a yield penalty of 0.5 tonne per hectare per day.

Sampling Pattern

Draw from at least 20 different locations in the field. At each location take one leaf branch from each of 3-4 plants (minimum of 60-80 branches in total). Do not sample fields within 3-5 days after being sprayed with pesticides or foliar nutrients.

Sampling Instructions for Potato Petiole Analysis

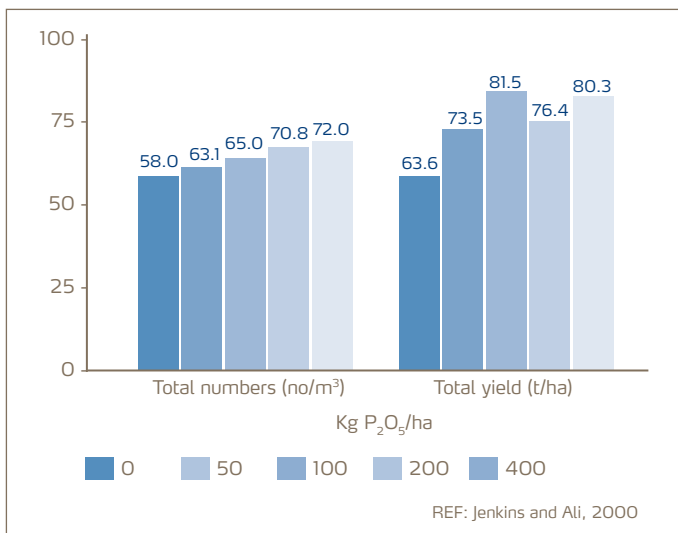
Choose the youngest fully expanded leaf (usually 4th) at a stage no earlier than 10% flowering. For each complete leaf, separate the leaflets from the petiole, and discard the leaflets as soon as possible after sampling. Keep samples in a cool dark place, and send to the lab immediately.

Increasing Potato Tuber Numbers

The numbers of potato tubers produced by each plant is influenced by agronomy and varietal potential. A large number of tubers per hectare will produce a crop of predominately small tubers, ideal for canning, salad or seed potatoes. A relatively low tuber number provides less competition per unit area and allows the crop's energies and resources to be used to produce larger potatoes for the fresh or processing markets.

Phosphate availability at tuber initiation is important to ensure maximum tuber set, especially if tuber numbers need to be increased for certain varieties, or where the market demands a large number of smaller tubers (e.g. seed production).

Phosphorus and yield (Wales - Desiree)

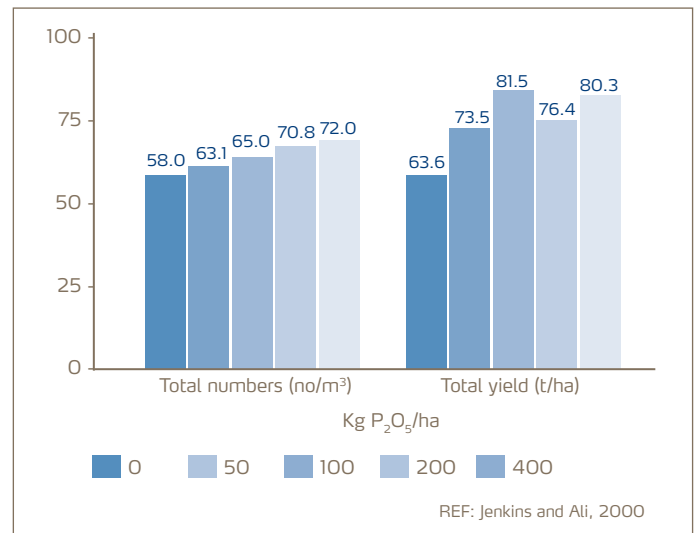


Study from Wales showing the effect of phosphorus on increasing total tuber numbers and overall yield.

Because phosphorus is relatively immobile in the soil it is important that fertilizer phosphate is placed close to the tuber, banding the fertilizer usually works better than broadcasting, especially on soils with the potential for very high phosphorus lock-up.

While potatoes are very responsive to fresh phosphate, the economic optimum rate is often difficult to define. Rates will depend on soil type and soil test results. Where sufficient soil phosphate is not available for growth, foliar phosphate ensures rapid availability.

Foliar phosphorus - Effect on tuber number (Scotland - Estima)



Study from Scotland showing the effect of foliar phosphorus on increasing total tuber numbers.

YaraVita™ MAGPHOS K

To increase tuber number, 10 l/ha at tuber initiation (when 50% of the tip swellings are twice the diameter of the rest of the stolon).

