

SWEFACTSHEET#6

How do I turn Nutrients into Fertiliser?



Finding the right fertiliser can be a daunting task, there are just so many out there. How can you break through the jargon and marketing hype to find out what is really best?

In this Fact Sheet, we expose a few "Trade Secrets" that will let you use the nutrient requirements on a SWEPS Soil Test to work out which fertiliser will best do the job.

There are so many fertiliser suppliers with so many products, how can I use a SWEPS soil test to compare them?

Fertilisers—whether organic or 'synthetic'—are chemical compounds that contain nutrient elements in forms that will be available to plants. The trick is to apply the amount of fertiliser that contains the quantity of nutrient you need.

First, let's look at what is meant by NPK. These numbers represent the percentage of nutrients in a fertiliser. Because they are percentages, if you multiply them by 10, you get the number of kilograms of nutrient per tonne of fertiliser. For example, Single Superphosphate is 9% Phosphorus (NPK=0:9:0), so you will get 90 kg of actual P with every tonne (1,000 kg) of Super. Other nutrients in this fertiliser are Calcium and Sulphur, but they are not included on the NPK.

A word of warning, however, not all countries use this system and some imported fertilisers (and books) may quote figures as N:P₂O₅:K₂O. To convert these to NPK, simply multiply P₂O₅ by 0.44 and K₂O by 0.83.

Many fertilisers contain more than one nutrient, for example, a typical NPK for Poultry Manure is 2:1:1. That is 2% N, 1% P & 1% K. When looking for a fertiliser, it is best to start by considering the recommendations on the soil test. These are in kg/ha, so they don't compare directly with NPK, but their relative proportions will give you a place to start.

Let's suppose your recommendation was: 25 kg N/ha, 10 kg P/ha & 20 kg K/ha, the idea would be to build a 'shortlist' of suitable fertilisers.

To do this you need to choose one nutrient to start with. Let's say this is phosphorus. To work out the application rate of N:P:K 16:8:9 (these second fertiliser in Table 1) that will supply 10 kg P/ha, first work out the kg P per tonne of fertiliser (P% in NPK x 10) and calculate as follows: (10 kg/ha ÷ 76 kg/tonne) x 1000 = 131 kg/ha. Then multiply this figure by the N% in the NPK to see how much Nitrogen this fertiliser will supply: 131 x 15.9% = 20.8 kg N/ha.

The result of these calculations for each fertiliser in a shortlist for this example is given in Table 1. You can see that 16:8:9 is the closest match, but will there be enough Potassium?

| Fertiliser NPK | Application | Nitrogen |
|----------------|-------------|------------|
| 13.3:6.2:6.5 | 161 kg/ha | 21.4 kg/ha |
| 15.9:7.6:9.0 | 131 kg/ha | 20.8 kg/ha |
| 16.3:8.7:0 | 115 kg/ha | 18.7 kg/ha |
| 7.7:4.8:5.5 | 208 kg/ha | 16.0 kg/ha |

Table 1. Fertiliser application that supply 10 kg P/ha, with the corresponding amount of Nitrogen.

Repeat the calculation for the N supplied, but using the K% in the NPK instead. That is, 131 x 9% = 11.8 kg K/ha. Clearly this is not enough.

To make up the difference, subtract the amount supplied from the required requirement ($20 - 12 = 8$) and use this to work out the application rate for a suitable Potassium fertiliser.

Assuming you wanted to use Sulphate of Potash (41.5%K), the application rate would be: $(8 \div 41.5) \times 1000 = 19 \text{ kg/ha}$.

By itself, this is not much, but your suppliers should be able to combine the two into a blend, giving you exactly what you require.

Trace elements

The process is the same for trace elements, but you will need to look up the nutrient percentage of a fertiliser for each one, use this to calculate the application rate and get your supplier to blend these in as well.

To simplify matters, some suppliers will be able to set trace element "King mixes" and do the calculations for you. If not, or if you want to use a so-called "shot-gun" trace element product (one that has some of everything), feel free to call us for assistance.

Finally, remember that if your soil pH is below 5.7 – do not apply the trace elements until Lime applications have had time to bring it above this level. And if the pH is above 8.0, do not apply trace elements to the soil at all – use foliar sprays instead.

This is a very brief description of how to calculate fertiliser applications, so if you need more help, contact SWE Pon (03) 97016007.