

# How Nitrogen Affects Soil Acidity

- When the nitrification process converts ammonium to nitrate, hydrogen-ions are released and is one of the contributing factors leading to acidification. So nitrogen sources (fertilizers, manure, legumes) containing or forming ammonium-N increase soil acidification, unless all the ammonium-N is absorbed directly by plants. Also, when nitrate-N is leached, basic cations, such as calcium, magnesium and potassium, are leached in association with the nitrate. The nitrate-nitrogen and cations move out together and as these are removed and replaced by hydrogen ions, soils become more acid.
- When the mineralization process decomposes soil organic matter, the first nitrogen product is ammonium-N. As it converts to nitrate, hydrogen-ions are released. This, like mineral ammonium-fertilizers, is a major cause of soil acidification. Nitrate fertilizers, such as sodium nitrate and calcium nitrate in which the nitrate is present with a basic cation, calcium or sodium, will not acidify the soil.



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This table shows how different nitrogen sources affect the pH of soils.

<b>Nitrogen Source</b>	<b>N Content %</b>	<b>Lt's PH-PLUS /kg N <sup>(1)</sup></b>
Ammonium Sulphate	21	3.1
Anhydrous Ammonia	82	1.0
Ammonium Nitrate	34	1.0
Urea	46	1.0
UAN Solution	28-32	1.0
Calcium Nitrate	15.5	.5
Potassium Nitrate	13	1.2
MAP	10-11	3.0
DAP	18	1.8
CAN	26	.4

- 1 Amount of PH-PLUS required to either neutralise the acid-forming reactions of 1kg N or the amount of PH-PLUS required to equal the acid-reducing effects of 1kg N.
- 2 Most of the acid forming effects are due to the activities of the soil bacteria during nitrification.

