High nitrate-N fertilisation decreased the incidence of blossom-end rot

In this experiment, tomato plants (cv Sonato) were transplanted in Rockwool cubes and grown in a flowing culture system supplied with nutrient solution at a flow rate of approximately 2 liters per minute. Three different proportions of ammonium-N (0, 20 and 40%, the balance being supplied as nitrate) were compared in this study. Inclusion of a proportion of ammonium-N in the nutrient solution decreased the amount of acid required to maintain the pH but increased the incidence of blossom-end rot (Table 1). The numbers of fruit affected by blossom-end rot increased somewhat by inclusion of 20% ammonium-N, and more markedly by addition of 40% ammonium-N. At the start of the season, when prices are high, the incidence of blossom-end rot is particularly undesirable. Especially the first trusses in this experiment were affected, although damaged fruits were observed during much of the season. Plants grown with high ammonium-N developed magnesium and calcium deficiencies symptoms, presumably due to antagonism between ammonium ions and these divalent cations. Both the calcium and magnesium contents of the leaves declined with increasing levels of ammonium-N (Table 2). The tolerance level for ammonium-nitrogen in a flowing culture system is thus very low, and the degree of pH control is rather limited.

Table 1. The effect of ammonium-N on the percentage of tomato fruit affected by blossom-end rot.

Percentage of tomato fruit effected by blossom-end rot			
Number of harvests	Nitrate to ammonium-N ratio		
	100-0%	80-20%	60-40%
1 - 4	0	24	46
1 - 8	1	6	19
1 - 23	0,4	2	7

Table 2. The effect of ammonium-N on the content of calcium and magnesium in tomato leaves.

Content in tomato leaves	Nitrate to ammonium-N ratio		
	100-0%	80-20%	60-40%
% Ca	1,82	1,48	0,87
% Mg	0,29	0,25	0,20