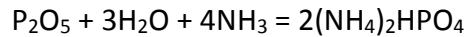


## Task #80857

A Crop of Maize needs 5 kg of  $P_2O_5$  /ton of grain. If the yield goal is 12 ton/ha and the soil has a concentration of 10 ppm of  $P_2O_5$ , how many kg of Diammonium phosphate (DAP fertilizer with 50% P) must be added in the basal fertilizer to meet the crop demand? Assume we apply all 100% DAP at one time.

### Solution.

Firstly, we need to find how many  $m'(P_2O_5)$  we need for the harvest.



$$m'(P_2O_5) = 5 \text{ kg/ton} * 12 \text{ ton} = 60 \text{ kg}$$

Secondly, since 10 ppm phosphorus is present in the soil, we must dissolve the resulting mass by the concentration of phosphorus in the soil. (10 ppm = 0.005%)

$$m_t(P_2O_5) = 60/0.001 = 60000 \text{ kg}$$

$$n_t(P_2O_5) = 422 \text{ 535 mole}$$

$$n((NH_4)_2HPO_4) = 845070 \text{ mole}$$

$$m((NH_4)_2HPO_4) = 97183.05 \text{ kg}$$

### Answer:

$$m((NH_4)_2HPO_4) = 97183.05 \text{ kg}$$