



The Potash
Development Association

POTASH

December 2016



Forage Maize – Phosphate & Potash offtakes

With the huge increase in growing forage maize to feed anaerobic digesters, especially in the arable areas of Eastern England, it seems appropriate to consider the harvested offtakes of phosphate and, especially, the high amounts of potash removed.

Standard values for phosphate and potash offtakes show that harvesting maize for silage, with an average yield of 40 t/ha, removes about 56 kg P₂O₅/ha and 176 kg K₂O/ha. As always, higher yields remove more, so 50 t/ha, which is often achieved, will remove about 70kg P₂O₅/ha and 220kg K₂O/ha.

To maintain soil indices these amounts must be returned to the field through applications of organic manures or fertilisers, and because they are large amounts, they should be applied for each maize crop grown.

While it is “normal practice” that digestate is applied to the fields supplying the AD plant, the quantities of digestate applied need to be checked to ensure the crop offtakes are adequately replaced on a field by field basis.

Individual lab analyses for the nutrient content of digestate are usually supplied to the farm. However, using typical values, 55 cu m/ha of whole digestate is needed to replace the potash offtake in a 50 t/ha



crop of maize. Where less digestate is applied, PK fertilisers will need to be applied to make up the shortfall.

The big emphasis put on maintaining target index for K (index 2-), when growing maize, is due to the huge peak uptake of potash by the crop during its growing period. The peak could be 360 kg K₂O/ha in August, so it needs to be able to access this large amount from the soil, even though by harvest time some will have been returned to the stubble and soil as the crop ripens and dies off.

There is a modern trend for maize to be harvested earlier than traditionally, especially for AD plants and where soil erosion is a risk. In these cases the greener crop will remove much higher levels of potash than the standard figures (see above) imply.

For phosphate the crop uptake is much lower, and the most important point is to get enough applied when planting the crop, to get good root establishment.



web: www.pda.org.uk