KEYSOIL
Unlocking Soil Potential

Case study 15

Cereal straw incorporation has benefits for root crops

- Gross margin is £96/hectare greater as a result of soil organic matter management – taking account of all the benefits and costs, which applied to the entire arable area on this farm.
- 5 years to realise the full benefits. The costs of building up soil organic matter were greater than benefits for 1st year.
- Over 100% return on this investment over a 20-year period.

Background

This farm grows winter wheat and winter barley, along with onions, potatoes, beans and sugar beet as break crops.

It operates two rotations based on soil type described as sandy loam but heavy in places:

- Lighter land: 2 break crops / 2 cereals.
- Heavier land: 1 break crop / 4 cereals.

Average rainfall is low in this area, and so the sugar beet and onions are irrigated by trickle irrigation.

Soil organic matter management

Until 1996 an intensive pig unit provided farmyard manure. Since this part of the business closed, straw has been chopped and incorporated in addition to the other crop residues. This farmer did not consider that soil organic matter was being actively managed with this change in straw management. However, he was clear that the value of the straw incorporation to his soils was greater than the offer from a neighbouring farmer to purchase the straw for £12.50/hectare.

What difference has organic matter management made?

The most important benefit from straw incorporation was the notable reduction in soil surface capping. This has particularly helped improve crop establishment, providing an even and more consistent yield of onions and sugar beet. As a result he found that, on average, he gets an extra 2.5 tonnes/ha of onions and 6 t/ha of beet.

Soil capping has not significantly affected cereals, but for the last 5 years cereals have not required P and K as a result of incorporating crop residues.

With straw being incorporated on the lighter land the farmer thought he might see some reduction in irrigation requirements, but this has not happened yet.

Costs:

- Lost revenue from straw sale. In this analysis we use the figure of £12.50/ha for standing straw, which was a genuine proposed value.
- An allowance for additional fuel used in chopping straw.
- There was a small cost of treating an increase in slugs on heavier land going from sugar beet into cereals.

Comment

Taking the benefits and costs described above into account, we found the net benefit to be £96/ha higher than prior to incorporation of straws. This has taken 5 years to realise, and the costs of building up organic matter were greater than the benefits for the 1st year. As an investment over a 20-year period, the return is well over 100%.

The large gain from managing soil organic matter on this farm reflects a modest yield increase in high-value crops. This farmer is also not losing a huge amount of revenue by incorporating rather than selling straw. However, the standing straw price could rise to £90/ha and it would still make financial sense to incorporate it.

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