

Managing cereal crop residues

Cereals are an important break crop in a number of vegetable rotations. After harvesting the grain, growers can either bale the straw residue and sell it, or incorporate it back into the soil to increase organic matter content. Weighing up the relative benefits of each approach can be difficult, especially as short-term profitability often competes with longer term drivers of soil quality.

Andrew Luxmoore is a crop supervisor with AS Wilcox and believes that incorporating residues back in to the soil promotes healthy soils. “To get the most from our soils, we know we have to put back what we take out; otherwise they can get harder and harder to work. Regular organic matter additions are essential to ensure the physical structure of the soil is retained, the biology is right, and there is an ongoing supply of nutrients for our crops.”



The straw residue can be difficult to manage at times, as it tends to be slower to break down because of the ‘woody’ nature of the dry material. However, Andrew also noticed that the straw provides a pathway for water to move quickly into the soil. “Where we have incorporated the residue back into the soil, we’ve found that the hollow stems can actually improve water infiltration. The soils also appear to dry out quicker in the spring.” Similar observations have been reported by other growers in the area with forage brassica residues, which also have hollow stems.

Retaining the straw does mean giving up some income from otherwise baling and selling it to livestock farmers. Following a cereal crop like barley, growers may be able to earn about \$400 per hectare from the straw.

The final return will vary depending on market demand for the feed and the associated costs to bale and remove it. While this is an appealing short-term option, it is important to recognise the trade off. In addition to the loss of future organic matter, nutrients are also exported.



Paul Johnstone of Plant & Food Research has worked with Andrew to quantify these nutrient losses if the straw is sold. Based on the nutrient content in the straw and off-take of about 3 tonnes of dry matter per hectare, about 15 kg nitrogen, 1 kg phosphorus, 46 kg potassium, 4 kg sulphur and 3 kg magnesium per hectare would be lost. If every unit of fertiliser applied were available to the crop, it would cost about \$130 per hectare to replace these nutrients.

While this cost is less than the income from selling the straw, it adds to the reasons to keep the residue in your paddock. Paul notes, “We don’t have a good method yet to value carbon and particularly the wide range of services it provides within the soil. But growers know from experience that paddocks with a long history of cultivation and low organic matter typically require more working and can produce lower yields.”

The key question growers should ask is whether they have a strategy in place to retain or build organic matter in the soil to combat the effects of regular cultivation. If not, growers should carefully consider how crop residues are handled.

To help to calculate the direct nutrient losses associated with selling straw residues, FAR have developed a simple spreadsheet. By adjusting fertiliser costs and bale size, growers can quickly estimate the cost to replace nutrients for a range of different cereal crop residues. The tool is freely available on their website (www.far.org.nz).



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