

# Using ramial woodchip as part of a whole farm system



## WOOFS Technical Guide 3

# Introduction

Can Ramial Chipped Wood (RCW) produced on farm from the management of trees and hedges be used as a sustainable source of fertility and organic matter for arable and horticultural production? The WOODchip for Fertile Soils (WOOFS) EIP Operational Group have investigated this innovative technique linking tree and hedge management with annual cropping through on-farm trials. This is the third of three technical guides from the WOOFS project; the first technical guide focuses on the logistics and economics of using RCW, the second outlines key results from the project's on-farm trials; this guide puts the use of RCW in a whole farm context, considers the wider ecosystem service benefits and barriers to adoption as well as giving an overview of the support available and regulations that farmers and growers should be aware of.



## What is Ramial Chipped Wood (RCW)?

Ramial Chipped Wood (RCW) is fresh un-composted woodchip made from smaller diameter younger tree branches. Nutritionally these are the richest parts of trees, with young tree branches containing as much as 75% of the minerals, amino acids, proteins, phytohormones and enzymes found in the tree. Hedges, brash and branches from woodland management and Short Rotation Coppice (SRC) are all great on-farm sources of RCW.

## What farming systems are best suited for RCW?

There are some logistical constraints to RCW production and use on farm and it will not be suitable for every situation, the logistics are outlined in more detail in the first technical guide. In general though RCW is well suited to arable or vegetable farms with no rotational use of livestock; smaller fields with a higher hedge to field ratio; or fields with space adjacent to or within the cropped areas that can be used for the growth of coppice for RCW production. Within the field this could be in the form of SRC agroforestry rows, for example the willow and hazel SRC at Wakelyns agroforestry. Adjacent, this could be SRC or longer rotation forestry with the brash intended for RCW production. Where field boundary hedges are used, they must be suited for coppice management.

Organic or other farming systems where some areas are rotationally out of crop production and used for fertility building leys are well suited, as RCW can be applied directly to the ley without concerns about nitrogen lock up, spreading in winter is also easier on vegetated ground. The chip can also be spread prior to a spring crop on the winter stubble of the previous crop. However, incorporating the woodchip prior to spring sowing may cause some nitrogen lock up and additional fertiliser use should be considered. RCW can also be spread onto pasture as part of a mixed or livestock only farming system to improve the soil.

## Farmers and growers attitudes to woodchip

As part of the WOOFS project as well as interviewing the farmers and foresters involved in the trials, we carried out a short online survey of farmers and growers attitudes to using woodchip. We received 31 responses to this survey from 19 farmers and 12 growers, just over half (17) were organically certified and 18 had considered using farm sourced woodchip for various means. The main sources of fertility and organic matter used by the survey respondents were farmyard manure, green manures and composts, with four respondents also using woodchip.

Four open ended questions were asked, answers were grouped:

### 1. What might prompt you to use woodchip on soil?

The main reasons given were; if it was cost effective (23%); if more information was available (23%) and if it was more widely available (19%). Two respondents were already using RCW on their soil.

### 2. Is there anything that prevents you using woodchip?

25% of respondents said that there wasn't anything preventing them using woodchip, 20% said a lack of availability prevented use, 12% were not interested, 10% were concerned about N lock up specifically and a further 10% a lack of knowledge more generally.

### 3. How do you make use of trees and hedges on your farm?

The top answers were fuel (41%) and shelter (38%), other uses included livestock management, wildlife benefits, timber and woodchip for mulch.

### 4. Have you ever considered using farm sourced woodchip - why?

58% of respondents had considered using farm sourced woodchip (two were already doing so), of these the top reasons were carbon sequestration or other soil benefits (39%) and becoming more self-sufficient in inputs (28%). 42% had not considered it, the main reasons here were a lack of machinery and other logistical challenges (31%), availability – either plentiful supply externally or insufficient materials on farm to make production worthwhile. 23% had not considered it as an option.

## Trees and hedges on farm – better management and more planting

Hedgerows and farm woodlands are an important part of the cultural landscape of lowland Britain. Traditional management provided a variety of products, including fuel, building materials and food. On today's farm, hedges, trees and woodlands can provide shelter for crops and livestock, important habitats for farmland biodiversity and contribute to soil and water management. However, as a resource most are underutilised. Woodlands are often unmanaged, and hedges are either cut back annually or are neglected altogether. Hedges need periodic rejuvenation by either laying or coppicing to ensure their long-term future. Rejuvenation management methods are time consuming and costly and identifying practical uses for hedge material could help encourage sustainable hedge management. Coppicing provides an opportunity to rejuvenate old hedges and has the potential to provide other economic benefits, for example as a source of woodchip for fuel, RCW or animal bedding. Reintroducing coppice cycles into small unmanaged farm woodlands provides a potential source of both RCW and firewood as well as the benefits to the woodland of restoring active management. An alternative or additional option for on farm RCW production is to plant more trees either as hedgerows, farm woodlands, shelterbelts or SRC coppice agroforestry rows. These can be designed to be multipurpose for example, for use as RCW, logs or fodder, but also sited to provide shelter and with tree species chosen to maximise biodiversity benefits.

Coppicing on a rotation creates a diversity of tree and hedge structures within the landscape, providing habitats for a wide range of flora and fauna. However, introducing coppice management to field boundary hedges will change the structure of the hedge and hence the function and interactions with the adjacent land. For example, a hedge allowed to grow tall to produce suitable sized stems for coppicing may also become less dense at the base reducing shelter for wildlife. Then when coppiced there will be a break in habitat continuity for a short time and a reduction in shelter/ shade provision. The speed of regrowth will depend on the species, location of the hedge and browsing pressure but coppicing encourages multiple stems and within 6-18 months there will be dense regrowth at the hedge base.



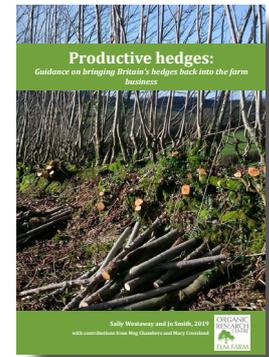
Elm Farm  
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Re-growth  
seven  
months after  
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The introduction of more trees and alternative tree and hedge management methods adds another level of complexity to farm planning including the need to plan crop rotations around coppice cycles to reduce competition for light and allow access to the trees for management.

For more information on hedge coppicing see Productive Hedges: guidance on bringing Britain's hedges back into the farm business <https://zenodo.org/record/2641808#X2tZQot7nIU>



## Soil carbon, Green House Gas (GHG) emissions and protection of watercourses

Globally soils contain over three times the quantity of organic carbon found in vegetation and double that of the atmosphere<sup>1</sup>. Soil cultivation for annual crop production speeds up the decomposition of soil organic matter and contributes to the loss of carbon from the soil. To counteract these losses and help towards the UK targets for Net Zero<sup>2</sup> we need to identify methods to increase carbon sequestration and protect existing carbon stocks in cultivated soils. The dominant pathway for carbon to enter the soil is through fine root turnover and increasing the length of crop cover together with reducing cultivations and will help to maintain soil carbon. Addition of organic amendments such as RCW have a role here as well, by introducing more organic matter to the soil, RCW has the potential to mitigate some of the carbon losses associated with cultivation.

In contrast to other industries methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O) are the main GHGs from agricultural systems. About half the nitrogen added to soil as fertiliser is either emitted to the atmosphere as ammonia, nitrous oxide or other gaseous forms, or finds its way into surface and ground waters as nitrate<sup>3</sup>. To support profitable production and protect the environment nutrients should be managed effectively. A significant proportion of the nutrients in RCW and other organic amendments are organically bound and insoluble, making them unavailable for immediate plant use, but over time

soil microbes act to mineralise and release these nutrients in an organic form that can be used by plants. This slow release of nutrients, which needs to be planned into cropping cycles, makes RCW less susceptible to large nutrient losses during a single rain event, unlike soluble inorganic fertilizers. Additional benefits of protecting and increasing soil organic matter using organic amendments include improvement of soil quality through increased retention of water and nutrients.

# The support and regulatory environment



*Willow Short Rotation Coppice at Wakelyns Agroforestry*

## Policy and grant support

### Hedgerows and boundaries grants:

Under current countryside stewardship schemes there is support available for hedge coppicing (BN6). This is available as a standalone capital grant or as part of mid or higher tier countryside stewardship and pays £4/m as a method of rejuvenating old hedges with new growth from stool bases helping to fill in gaps in old hedges.

Woodland creation, management and tree planting on farm: Support is available from various sources to fund the establishment and management of more trees and hedges on farms both within the current stewardship schemes [www.gov.uk/government/collections/countryside-stewardship](http://www.gov.uk/government/collections/countryside-stewardship) and via organisations such as the Woodland Trust ([www.woodlandtrust.org.uk](http://www.woodlandtrust.org.uk)).

Looking forward: The new three-tier Environmental Land Management (ELM) scheme proposed by government seeks to move away from farm support based on direct payments to one centred on “public money for public goods”. Carbon stored in soil is a public good and tree planting on farmland, as well as more sustainable management of existing trees and hedges, are likely to continue to be supported for their public good provision.

### Standards and regulations

RCW production on farm: If you are planning to produce ramial woodchip on farm there are a few legal considerations it is worth being aware of.

- Cross compliance rules when claiming rural payments currently restrict hedge cutting during the bird nesting season. Check with government websites for up to date information
- A Felling Licence is needed if more than 5m<sup>3</sup> of timber is cut in a calendar quarter and if the stems are over 15 cm in diameter at breast height (1.3m) for coppice or 8 cm for single stems ([www.forestry.go.uk](http://www.forestry.go.uk))

## Woodchip – when is it waste?

The 2017 Environment Agency position statement on waste wood<sup>4</sup> states that virgin timber, which includes whole tree woodchip, branches and sawdust, is not subject to waste rules, so may be carried and traded in the same way as if it had been produced from a forest. Ramial woodchip produced and used on farm fits this description and does not currently require any permits.

Plant clippings or trimmings that consist mainly of foliage, the leaves of a tree or leaves on the stems or branches; is classified as ‘green-waste’. This is currently classified as grade A waste wood and can be used for animal bedding, as a mulch, in composting, as a fuel in wood burning stoves or other sensitive uses. Tree surgeons working in the arboricultural sector typically produce grade A ‘green-waste’ and under current guidelines should register as a lower-tier waste carrier; as well as apply for waste exemptions to chip/shred and store the green waste. A waste exemption is an operation that is exempt from needing an environmental permit. It is free to register waste exemptions, and registration lasts for three years.

## Green Waste Compost production on-farm

In order to process or sell green waste compost on farm a permit from the Environment Agency is required. A green waste operation can also be certified to PAS100 when it then ceases to be waste and can be sold on the open market, otherwise it remains waste and will require permission from the Environment Agency to spread on farm land. Either route can be costly to set up and maintain and includes mandatory qualifications for the operator which have to be renewed. Full details of the PAS 100 are available from the British Standards Institution (BSI). Information is also available from The Composting Association at [www.compost.org.uk](http://www.compost.org.uk) or from the Waste and Resources Action Programme (WRAP) at [www.wrap.org.uk](http://www.wrap.org.uk).

Details of how to obtain permits and up-to-date guidance on licence and exemption requirements is available on the Environment Agency website: [www.gov.uk/government/organisations/environment-agency](http://www.gov.uk/government/organisations/environment-agency)

# Conclusions

As a valuable resource within our rural landscapes, trees and hedges need to be managed in a way which is sustainable, both economically and ecologically, and allows them to continue being healthy and vigorous so they persist for generations to come. Many farmers regard their hedges as an unavoidable cost rather than an asset. RCW has the potential to provide an additional incentive for farmers to both plant new trees and manage existing hedges and woodlands whilst supporting wildlife and other their wider ecosystem services. RCW can also help close the carbon cycle by using woodchip from tree and hedgerow management as organic soil amendment in arable land.

During the course of the project we found that the wider attitudes of farmers and growers to the production and use of woodchip on farm was very variable. Knowledge gaps and uncertainty about the risks of nitrogen lock up were key barriers to adoption, along with more generally costs of production, logistics and availability. The main motivations were around soil health, carbon storage and a desire to be more self-sufficient and less reliant on external inputs.

RCW produced on farm currently has less regulatory requirements than green waste compost, but cross compliance and other restrictions around timing for hedge coppicing and felling licences for larger volumes where fuel or logs are also being extracted may need to be considered. Hedge coppicing and tree and hedge planting are supported under current environmental stewardship schemes and the new ELM scheme is likely to continue to provide support for tree and hedge management as well as to recognise the importance of maintaining soil health in agricultural systems.

## References

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3. Kibblewhite M (2007) Implications of farm management on the nutrient cycle. <https://www.green-alliance.org.uk/resources/The%20nutrient%20cycle.pdf>
4. Environment Agency (2017) Quick guide 43\_17 Waste Wood > <https://tinyurl.com/EA-waste-wood>

## Useful publications

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- Raskin B, Osborn S (2019) The Agroforestry Handbook: Agroforestry for the UK. [www.soilassociation.org/farmers-growers/technicalinformation/agroforestry-handbook/](http://www.soilassociation.org/farmers-growers/technicalinformation/agroforestry-handbook/)

## Useful websites

- Countryside stewardship schemes (including woodland creation and hedgerows and boundaries grants): [www.gov.uk/government/collections/countryside-stewardship](http://www.gov.uk/government/collections/countryside-stewardship)
- The Woodland Trust [www.woodlandtrust.org.uk](http://www.woodlandtrust.org.uk)
- Forestry Commission (information about felling licences): [www.forestry.gov.uk](http://www.forestry.gov.uk)
- Hedgeline: <http://hedgeline.org.uk>
- Environment Agency [www.gov.uk/government/organisations/environment-agency](http://www.gov.uk/government/organisations/environment-agency)
- The Composting Association: [www.compost.org.uk](http://www.compost.org.uk)
- Waste and Resources Action Programme (WRAP) [www.wrap.org.uk](http://www.wrap.org.uk)
- Match-making site for tree surgeons and people wanting woodchip: <https://freewoodchips.co.uk/>

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WOOFs EIP Operational Group visit to Tolhurst Organics

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