



Woodchip for Livestock Bedding



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Foreword

There is considerable interest in using alternative materials as bedding when housing cattle and sheep indoors. The 'Woodchip for Livestock Bedding Project' took place from December 2005 to June 2008 and evaluated the performance of woodchip in both controlled and commercial farming situations. This booklet is based on the guidelines and recommendations from that project and provides information on how to use woodchip effectively as a bedding material and the steps that should be taken to create a usable product after housing.

Woodchip can be an effective bedding material for cattle and sheep but it may not be suitable for some farms. Farmers should assess the benefits in relation to their own individual circumstances.

It is important to note that this booklet only deals with woodchip for use as an indoor bedding material and the specifications and descriptions given are not suitable for housing animals outdoors on 'woodchip pads'.



Sourcing woodchip

There are several options for sourcing woodchip. Home-grown wood or recycled wood that can be chipped on the farm are likely to be the most cost-effective options.

You may have a source of wood on your farm as a result of managing broadleaved or coniferous woodland or from hedgerow maintenance. Wood from managed woodlands should be felled 6-12 months prior to use to allow it to dry before chipping. Hedgerow maintenance is unlikely to supply enough material but it can be added to other wood sources and should also be stored for at least 6 months to allow it to dry. Both hard and soft-wood species are suitable for woodchip bedding. It must be remembered that woodlands managed as part of an agri-environment scheme may have management agreements which prohibit felling. Check your circumstances.

Alternatively wood can be bought from the commercial market and be stored on your farm prior to chipping. This will give you control over the length of time that the wood is stored to ensure that the wood is sufficiently dry before chipping.

A number of makes of wood-chipper are available and these can be bought or hired. Buying or hiring a chipper between a group of farmers can help to reduce costs.

There are now several suppliers of woodchip (i.e. wood that has already been chipped) who are able to deliver bulk quantities of material. This woodchip is often made from green wood as a by-product of other wood processing activities. This woodchip is likely to have a high moisture content and will not be as effective as woodchip produced from dry wood.

It is also possible to purchase woodchip produced from recycled wood. This has advantages because the material is very dry but since pallets are often used make sure the supplier has removed all nails and other foreign bodies from the woodchip. Do not use woodchip produced from wood that has had chemical preservatives or glues used on it. This material may have a negative effect on the health of the animals and on the soil if the used bedding is applied to the land.



Sourcing woodchip

Woodchip specifications

Woodchip that is to be used as bedding must have a moisture content of less than 30% and preferably approximately 20%. Wetter material will cost you more – as it is much heavier - and it will not be as absorbent so you will need more of it.

The best size for the chips depends on what you intend doing with the bedding after use but in general a chip size of approximately 25mm x 25mm is recommended. If you plan to re-use the material as bedding for several seasons you can afford to use slightly larger chips as you do not need it to break down quickly during composting. But if you want to be able to spread the used bedding on your fields as soon as possible then a slightly smaller chip size is recommended.

A square blocky shape is more preferable to a thin 'pointy' chip as it is more comfortable for the animals and it reduces the risk of the chips sticking between the hooves and causing pain and lameness.

Storing woodchip

It is much easier to store and dry wood while it is still in the round. Once wood has been chipped it is very voluminous and will absorb moisture more readily.

Storage and handling facilities can prove difficult. Woodchip needs good dry storage and because it is so bulky it takes up a lot of space. Mechanical handling of woodchip is recommended because manual handling is extremely time-consuming. Therefore, you should only consider woodchip as a practical alternative to straw if your sheds are suitable for driving into.



Housing cattle and sheep on woodchip

Demonstration work undertaken by ADAS Pwllpeiran, IGER Aberystwyth and Glynllifon College and practical evaluations on 10 demonstration farms across Wales showed that woodchip can be an effective bedding material under cattle and sheep.

Provided that the woodchip has a moisture content of less than 30% it provides a good alternative to straw as a bedding material. The standards of health, welfare and cleanliness of the animals were at least as high for animals housed on woodchip as for those on straw.

Woodchip may be most effective when animals receive a drier diet. More woodchip bedding is needed to cope with animals fed a wetter silage-based diet. Cattle and sheep perform well on woodchip bedding although there were some indications that woodchip may not suit finishing lambs.



Housing cattle and sheep on woodchip

Housing conditions

Woodchip is very free-draining and excess liquid may run through it quickly so woodchip is best used as bedding in sheds that have a concrete floor. Concrete floors prevent the liquid from soaking away and hold it long enough for it to be absorbed into the woodchip from below. If the floor is made of hardcore or soil then care should be taken to avoid any runoff reaching nearby watercourses.

For both cattle and sheep start with a layer of woodchips approximately 10cm deep and apply a fresh layer of bedding as required. This is preferable to having a deep layer at the start as woodchip tends to become mucky on the surface whilst the layers underneath are still dry and clean.

It is often hard to accept the appearance of soiled woodchip bedding, particularly when compared with the clean appearance of straw. However, when straw is dirty the animals quickly get mucky and fresh bedding is required. In contrast, even when woodchip appears dirty the animals will often remain clean and dry.



Therefore, don't be tempted to apply fresh woodchip as soon as the existing bedding appears dirty. Instead, be guided by the animals. The time to apply fresh bedding is when their coats begin to appear soiled. This is important to prevent any costly overuse of woodchip bedding.

What do you do with it afterwards?

Farmers using straw are familiar with cleaning out their sheds and storing the muck until the ground conditions are suitable for spreading it on the land. However, studies undertaken at Bangor University have shown that **woodchip-based manure must not be treated in this way**. Instead it must go through a composting process before it can be re-used.

Composting woodchip

Farmers have two main choices for utilising woodchip bedding after it has been used under housed animals.

- Re-use the composted woodchip as bedding the following year
- Spread the composted material on fields as a soil conditioner/fertiliser

Whichever use is chosen the material first needs to be composted. Remove the soiled woodchip bedding from the shed and store in a muck heap until you are ready to begin the composting process. To begin composting, form the woodchip bedding into a large heap or windrow in an area with space to turn the heaps and away from nearby watercourses.

If the intention is to re-use the material as bedding then it is best not to mix it with any other material such as straw-based manure to prevent contamination. However, if the intention is to spread it onto fields as soon as possible then mixing it with other materials such as straw-based manure will speed up the composting process.

Compost heaps of woodchip-bedding should be turned using a front end loader or a telescopic handler with a bucket every 4-6 weeks for the next 6 months. This aerates the heap and encourages microbial activity – you will know if this is happening because the heap will become hot and may have steam rising from it. Due to the very high temperatures that can be produced in woodchip heaps it may be necessary to add water from time to time, particularly in dry summers.

It is not uncommon for temperatures of up to 70°C to be produced. This has the effect of killing any pathogens and makes the material safe for re-using as bedding the following winter.

What do you do with it afterwards?

Composting of woodchip bedding is classed as a waste activity and needs to be registered with the Environment Agency. Talk to your local Environment Agency officers to ensure all relevant activities are included. This can also be done through the Environment Agency National Customer Contact line on 08708 506 506.

Composted woodchip bedding as a soil conditioner/fertiliser

ADAS Pwllpeiran and IGER Aberystwyth have assessed the nutrient value of the woodchip composts and their potential use as fertilizers/soil conditioners that could be applied to the land. In all cases, fresh woodchip-based manures (less than 12 months old) performed poorly when compared with straw-based manures or fertilizers.

Further work undertaken by Bangor University however, showed that more mature 3-year-old woodchip composts performed better than the immature 1-year-old composts.

Hence woodchip should be composted for at least 2-3 years before being applied to the land.

Re-using composted woodchip as bedding

Demonstrations at Glynllifon College have shown that composted material can be re-used as bedding material for several years before it has broken down sufficiently for use as a soil conditioner.

Provided that the composting guidelines have been followed to sanitize the woodchip by achieving at least 65°C for 7 days, re-using composted woodchip bedding can be a good way to reduce bedding costs whilst at the same time increasing the nitrogen content of the woodchip bedding and helping the composting process.

When re-using woodchip bedding material for several years, you should bear in mind that its volume will decrease during composting and so additional woodchip may be needed to supply enough material for the subsequent winter housing periods.

Is woodchip cost effective for me?

The benefits of using woodchip instead of straw will depend on your own farming situation. Before deciding whether or not to use woodchip as a bedding material, work out the quantities that you will need and the cost of sourcing woodchip and compare this with your usual type of bedding.

The table below shows the quantities of woodchip required for sheep and cattle over typical housing periods. Adjust these figures to correspond with your situation.

Type of animal	Number of animals	Quantity of woodchip
Breeding ewes	480	90 tonnes over 8 weeks
Adult cattle	72	95 tonnes over 16 weeks

These figures are approximate and full details can be found by visiting our website at www.hccmpw.org.uk.

The best scenario is to have a sustainable source of home-grown wood and hire a chipper or share the purchase of one if you are a member of a local farming co-operative or group. Alternatively, you can buy wood in the round from a local supplier and then hire in a chipper. Two of the projects's demonstration farms, Cae Coch and Blaencwm worked together to make sourcing woodchip cost effective for them both. Blaencwm had a supply of softwood that had been stored on the farm for over 12 months. After a long dry period a chipper was hired to chip enough wood to supply both farms. This gave a very high quality woodchip with a low moisture content. Haulage distances and costs were low because of the close proximity of the two farms and it was cost-effective to chip the wood for both farms on the same day.



Is woodchip cost effective for me?

Woodchip can be effective as livestock bedding, depending on the farm and farming system. The following questions will help you to decide whether woodchip may be a suitable option for you.

Do you have?

		Yes/ No
1.	Access to a sustainable supply of home-grown wood that isn't used otherwise?	
or	Access to a source of wood in your neighbourhood?	
or	Access to recycled wood?	
or	Access to another cheap source of dry wood?	
2.	Enough storage space to stockpile wood until it is dry enough for chipping?	
3.	Storage sheds that will keep woodchip very dry and are suitable for driving into?	
4.	Livestock housing with concrete floors that are suitable for mechanical handling of woodchip?	
5.	Areas outdoors for storing woodchip-manure whilst composting?	
6.	Sufficient areas that can store composted woodchip for up to 3 years before it can be applied to land?	
or	Sufficient areas that can store composted woodchip until the next housing?	

If you have been able to say yes to the 6 questions then woodchip is likely to be a viable alternative to straw bedding for your livestock.

Recommendations

The Woodchip for Livestock Bedding project provided a valuable insight into the suitability of woodchip as a bedding material. Whilst woodchip can be an effective bedding material for cattle and sheep, it may not be suitable for some farming situations and farmers should assess the benefits in relation to their own circumstances.

- **Woodchip as livestock bedding promotes high standards of health and cleanliness in sheep and cattle.**
- **Woodchip used for bedding must be dry. A moisture content of less than 30% is critical to maximize absorbency.**
- **Chipped wood should be stored undercover to prevent it absorbing additional moisture.**
- **Regular turning of used woodchip heaps during composting is needed to encourage high temperatures and kill pathogens.**
- **Woodchip compost is not suitable as a soil conditioner/fertilizer until it is fully broken down and this may take 2-3 years. During that time woodchip sanitized by composting can be re-used as bedding.**
- **Woodchip may not be a financially viable option if farmers have to purchase woodchip (check local prices). Woodchip derived from home-grown or recycled wood is likely to be more cost effective.**

For further information on this booklet or any of the work undertaken by HCC please contact HCC on 01970 625050.

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