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Economic benefits of grazed apple orchards in England



Shropshire ewes and lambs in a traditional cider apple orchard in Herefordshire, England (March 2017)

Grazing under half-standard or standard trees www.agforward.eu

Why graze orchards with sheep?

Orchard grazing can offer financial and environmental benefits. The experience of stakeholders in the AGFORWARD project is that some lowland sheep breeds (e.g. Shropshire) can successfully graze on orchards which have been pruned to a height of 1-2 m without noticeable losses in apple yields. Sheep producers can profit from an additional source of grass in the orchards, and the release of grazed land for hay production. Orchard owners can profit from reduced mowing costs, increased nitrogen cycling and a rent from the sheep owner. There can also be societal benefits in terms of employment and plant biodiversity.



Cider apple orchards have significant economic, biodiversity, and societal benefits. (Robertson et al. 2012) Cider apples are sold for their juice rather than their appearance and therefore the pesticide regime can be less intensive than that required for dessert apples. This reduction in agrochemical use provides opportunities for integrating sheep. In the UK, about a third of the cider apple orchards are comprised of "standard" or "half-standard" trees, which have been pruned to a height of 2 m and 1-2 m respectively. This pruning allows the yields from apple trees to be maintained when the grass understorey is grazed by "tree-friendly" sheep. In England, or-chard owners commonly use Shropshire sheep because, if managed correctly, they cause minimal levels of bark damage.

A key feature of grazed orchard systems is that it is necessary for the sheep to be absent from the orchard for 60 days before apple harvest (generally from August to October) to minimise faecal contamination of the fruit. Hence, a sheep producer must have access to separate non-orchard grassland where the sheep can be kept at this time. Thus, a grazed orchard system involves sheep, apple trees, the grass understorey, and an area of separate non-orchard grasslandfor supplementary grazing.



Electric fencing was used in the trial to separate the grazed and ungrazed parts of the orchard.



Annual cycle of sheep production showing the location **and movement** for sheep between an orchard (inner circle) and an area of non-orchard grassland (outer circle). Sheep must be absent from the orchard for 60 days before apple harvest, and need to be kept on the non-orchard grassland at this time. The sheep may use both the orchard and non-orchard grassland from November to February before being housed indoors for lambing. In April, the ewes and lambs can use the orchard until August and the grassland area can be used for hay production. The cycle then starts again.





Advantages

- For orchard owners: sheep in orchards can reduce mowing costs and land rents can provide another source of income
- Sheep grazing can also increase nitrogen recycling within the orchard and could reduce orchard fertilisation costs.
- For a sheep farmer: apple orchards provide additional grass and thereby an opportunity to use other grass fields for hay or silage production



Apple orchard with electric fencing

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Assessment of financial benefits

The gross margin of separately managing a cider apple orchard and a grass field with 10 sheep was compared with a grazed orchard system. The analysis assumes that both the grazing land and orchard land are available on the same farm. Although the actual margins depend on the assumptions made, the table below highlights some key considerations. The grazed orchard analysis assumed that sheep had no effect on the yield or quality of the cider apples, but the reduction in grass mowing from three to one increased the apple gross margin by \in 55 (\in 560 rather than \in 505). The gross margin from sheep production was assumed to be the same (\in 365), except for the need to make the orchard stock proof (- \in 65) and the increased transportation of sheep (- \in 45). The greatest benefit from grazing the orchard (April to July) was that the non-orchard grass area could be used to produce a valuable crop of hay (+ \in 290). Overall the grazed orchard system increased the margin from \notin 870 to \notin 1105, a benefit of \notin 235.

	Ungrazed orchard and grass field managed separately	Grazed orchard and grass field managed together
Apple gross margin	€505	€560
Sheep gross margin	€365	€365
Stock-proofing the orchard		-€65
Increased sheep movement cost		-€45
Hay production gross margin		€290
Overall gross margin for 2 ha	€870	€1105

Indicative annual gross margins for the separate management of 1 ha of cider apple trees and a 1 ha grassland area with 10 sheep compared to those for 1 ha of a grazed orchard with a 1 ha grassland area. Values are based on the assumption that £1 is equivalent to €1.1. (Burgess et al. 2017)

Opportunity for joint agreements

It is also possible to construct arrangements where orchard grazing provides a profit for both the orchard owner and the sheep farmer. However, the maximisation of the financial benefit in such agreements requires the minimisation of contract and transport costs.

Further information

- Robertson H, Marshall D, Slingsby E, Newman G (2012). Economic, biodiversity, resource protection and social values of orchards: a study of six orchards by the Herefordshire Orchards Community Evaluation Project. Natural England Commissioned Reports, Number 090.
- Shropshire Sheep Breeders' Association (2008). Two Crops from One Acre: A Comprehensive Guide to using Shropshire Sheep for Grazing Tree Plantations.
- Burgess PJ, Chinery F, Eriksson G, Pershagen E, Pérez-Casenave C, Lopez Bernal A, Upson A, Garcia de Jalon S, Giannitsopoulos M, Graves A (2017). Lessons learnt – Grazed orchards in England and Wales. AGFORWARD project. 21 pp.