

## Making the most of the space: establishing and managing understorey crops in alley cropping systems

**Source:** Jo Smith and Sally Westaway



**Picture 1. Team work! Planting flower bulbs in new agroforestry system at Tolhurst Organics, UK**

### Is there a market for the new crop?

Ideally, the new crop will complement what you're already producing (e.g. new lines of fruit or vegetables in a horticultural enterprise) but you may need to find a new market or generate interest for the new crop within your existing market. The scale of production may make it difficult to produce the volume needed for mainstream routes to market and so some creativity may be needed (e.g. direct selling, or adding value to produce).

### Why do it?

Planting trees into arable or vegetable fields means that land is taken out of annual production; depending on the design of the system, this could be up to 20% of the cropping area. There may be no return from the trees for many years after planting; this varies from approximately five years for fruiting species, or short rotation coppice systems to several decades for timber species. In many agroforestry systems, the area between the trees and under the tree canopy is an overlooked and under-utilised space, and unmanaged, this can create problems with weed control. One option is to plant alternative crops in the tree rows to provide an income in the years following tree establishment, or longer term if shade tolerant species are used. As well as increasing overall productivity, this also has the additional benefit of diversifying the range of marketable products from the system. However, this increase in complexity can present challenges, and the following points need consideration:



**Picture 2. Team work! Planting flower bulbs in new agroforestry system at Tolhurst Organics, UK**

### Be realistic about the extra resources needed

The initial establishment costs need to be considered, as well as the extra labour requirements for planting new crops. Looking forward, what extra infrastructure is needed for the new crop product? For example, extra storage space, or processing equipment. What are the labour requirements for on-going maintenance and harvesting? Ideally, choose crops that can be harvested during quieter periods of the year.



**Picture 3. Spring bulbs for bunches of cut flowers. Silvoarable system in Nottinghamshire, UK**

### Is there enough space under the trees for new crops to succeed?

In some tree systems, such as short rotation coppice, or high density fruit trees, the competition for resources such as sunlight, water and nutrients from the trees may be too strong to allow any understorey crops. Bear in mind that as the trees grow, the microclimate conditions will change, with shade and belowground competition increasing. This may mean that the understorey crops will need to change over time also, or eventually be out-competed.



**Picture 4. Rhubarb as an understorey crop at Tolhurst Organics, UK**

### Which understorey crops will suit the system?

New crops that could be established underneath the trees include herbs, flowering bulbs or cut flowers, perennial fruit and vegetables such as globe artichokes or rhubarb, mushrooms and berry bushes. Within the different crop types, some species and varieties will be better suited to the conditions found in tree rows (particularly levels of

tolerance to shade) and it may be worth trialling varieties or species on a small scale first to identify those best suited, before scaling up.

#### Where to find more information

Martin Crawford, of [The Agroforestry Research Trust](#) in the UK, has produced some beautiful and useful publications that cover a range of potential understorey crops. [Creating a Forest Garden](#) describes the design process and suggests a number of temperate species that could be considered for the tree understorey, as well as on-going maintenance requirements.

[Plants for a Future](#) is an on-line database of over 7000 edible and medicinal plants which allows you to search using a number of criteria including common and Latin names, keyword, family, habitat and use (medicinal, edible or other). It is also possible to search for a number of features at the same time, e.g. a plant for sandy soils, between 1 and 5m tall, that likes shade.