

The Great Cover-up

Crop covers can be a very useful tool for organic growers to advance crop maturity, extend the season, protect against frost and exclude pests. Choice of the correct cover for the intended purpose and careful management is essential for effective use. An ever-growing variety of fleeces, meshes and nets are available to growers.

Fleece

Fleece was originally developed to advance maturity of vegetable crops but can also be very effective at excluding pests and protecting against frost. Lightweight fleeces of around 17g/m² are the norm for general use providing 2 or 3 degrees of frost protection with heavier weights of 30g/m² protecting down to -5 or -6°C. Fleece is the cheapest crop cover option for growers and prices have fallen to 3.5p per square metre from six to seven pence a few years ago according to the Commercial Grower, mainly due to the influx of cheap imports from China. There is a quality issue, however, and UK manufacturers argue that the imports can tear down the seams. Imported fleece is more likely to use recycled material, which may make it more attractive to the environmentally conscious grower - but it can have a shorter life span. Reinforced edges help to prolong life, as can increased hair strength - provided this does not also reduce light transmission. Fleece is flimsy and easily damaged by large vertebrates like deer and raptors trying to access small animals trapped or sheltering underneath. Even rabbits are quite capable of making holes with their feet. Any damage will increase the likelihood of pests gaining entry to the crop and damaged sheets should only be re-used where crop advancement is of more importance than pest exclusion. Fleece should be dry when removed for storage and stored out of reach of small rodents that love to make nests out of it!

The best use of fleece is early in the season to make use of the temperature lifts gained underneath. This can be too much for summer crops and scorching of leaves in contact with the fleece can occur. Fleece can also promote soft growth, which will be more vulnerable to autumn frosts. Care is also needed to uncover crops in dull, not bright, conditions if possible. In cauliflower the use of fleece can delay maturity in winter crops by up to seven days as curd initiation is triggered by accumulation of

units of relative cold. A major disadvantage from a grower perspective is the difficulty of seeing what is happening underneath and of inspecting crops. Weeds can also advance at a pace under the fleece so that it is all too easy to miss crucial weeding windows if not careful.

Mesh

Mesh is more expensive than fleece but cost can be spread over several seasons, with some manufacturers justifiably claiming a life of up to ten years. Consequently the total amount of resources used is much reduced. There is considerably less crop advancement or frost protection under mesh, but as there is more airflow and less humidity as compared to fleece this should mean less disease problems. The tighter the mesh size the less air flow, however. Care is needed to secure the edges because as the crop grows, the edges can easily ride up, providing entry points for pests. The mesh size should be chosen according to what pests you are wishing to exclude. 1.3mm mesh will exclude cabbage root fly, carrot fly, aphids and most caterpillars, with the exception of diamond back moth. This size reduces flea beetle activity but 0.8mm mesh will exclude them altogether, and 0.17mm x 0.37mm mesh will exclude thrips. For some crops it may be necessary to use hoops to prevent damage to crop, particularly with the heavier meshes and on delicate plants such as baby-leaf spinach.

Using crop covers for pest control

The most important principle of using crop covers to exclude pests is that the cover must be in place before the pest infestation (including egg laying) has taken place. It should be borne in mind that some pests have been observed to lay eggs through mesh onto leaves that are touching the cover, and that it is easy to trap pests like flea beetles under the mesh if they are put on late. Covers



should not be used on crops where the pest is already in the soil. In all these cases it will also be more difficult for predators and parasites to attack the pests if they are excluded. The cover must remain intact until the target pests are no longer a threat as any tears can let them in. The edges should be well sealed, preferably by burying the edge, or at least the edge exposed to the prevailing wind. Care also is needed when removing covers for physical weed control as this can expose the crop to pests. If possible use pest forecasting to predict risk. It is also important to check that transplants are pest free prior to planting and covering.

Carrots

Crop covers are extremely effective for controlling carrot fly and thanks to the work of Rosemary Collier and Stan Finch at Warwick HRI, Wellesbourne the population dynamics are well understood. Crop covers should be used in conjunction with the HRI/HDC carrot fly forecast, which uses weather data to predict the timing of the two main carrot fly generations. The covers need to be applied before the time that flies start to enter the crop. Many growers use covers, particularly fleece, for early season crops to protect against the peak of egg-laying and leave later sown (late May/Early June) carrots uncovered depending on risk from late generations.

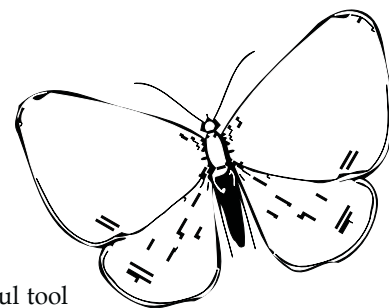
Brassicas

Brassicas are subject to many pests and crop covers are used not only to keep off cabbage root fly, mealy aphids and caterpillars but also larger pests such as birds and rabbits. Cabbage root fly is probably the most damaging of pests, especially of root brassicas and even conventionally the options are limited. Crop covers are effective against cabbage root fly unless pest pupae are present in the soil, which is a good argument against double-cropping of brassicas, even when allowed in the standards. Flea beetle is increasingly a problem for brassica growers and can be excluded by fleece, if not already present. It can get through wider mesh sizes, however and there is anecdotal evidence of flea beetles dropping their eggs through the mesh holes.

Other crops

Covers can be used for exclusion of pests on any crop where it is practical to do so. Lettuces can be covered to prevent root aphid damage, for example, or leeks for thrips. The balance is between the potential economic damage of the pest and the cost and effort involved in covering the crop.

The future of crop covers



While undoubtedly a useful tool for organic growers, we also have

to be aware of the carbon footprint of our activities and of the perception of consumers. Some growers have had complaints about the impact on local landscapes of acres of fleece. With the mantra “reduce, re-use and recycle”, we should first question whether the cover is necessary or if good biodiversity and habitat management measures can deliver instead. If covers are unavoidable then it is better to use a product that will last longer, while ensuring it stays intact long enough to do its job. There are also considerable costs of crop covers, not just in the material but also in the handling. Costs of handling covers, mainly to allow weed control, in HDRA studies of real farms, varied from £45-£300/ha for calabrese and for one farm was more than £700/ha in carrots. Many pest predators are excluded along with the pest. If pests are able to gain entry then the problems can be worse than if the crop had been left uncovered. Slugs can also be more of a problem under covers. So, while for many situations crop covers are necessary and useful, we should also be looking to develop alternative strategies where possible. There is also work underway to develop biodegradable crop covers, some of which are already commercially available. This is driven by the increase in costs of disposal as it is now illegal to burn or bury waste plastic covers on farm. At a recent HDC growers walk in Cambridgeshire a number of products were being trialled on early lettuce. Covers using biopolymers (manufactured from starch or cellulose) such as Mater-bi from Capatex are more acceptable than degradable plastic products but only suitable for early production and not pest control. A partially degradable viscose fleece is available from Capatex but susceptibility to tearing and wind damage together with difficulty pulling it out of the soil for removal, suggests it is not suitable for organic production. It was also not as effective as normal fleece at raising temperatures and had the lowest temperatures at night of any of the materials tested. So it appears there is plenty of work to be done to provide acceptable materials for organic growers at a suitable price and at sensible widths (at present there are technical difficulties manufacturing widths over 2m). The liking of the conventional boys for fleece, which you can spray and irrigate through, is surely going to drive future innovation in this direction.

Phil Sumption