PRACTICE ABSTRACT

Integrating flowers for attracting beneficial insects in protected cropping

Problem

Due to the need to maximise on space for high value crops, protected cropping systems (glasshouses and polytunnels) tend to be limited in crop diversity and therefore tend to lack flowering plants throughout the season. However, low levels of diversity and a lack of flowers may limit the activity of pollinators and natural enemies in providing beneficial services for crop health.

Solution

Design protected cropping systems to ensure the occurrence of flowering plants throughout the growing season – including wildflower strips, edible and commercial flowers, perennial herbs, and leaving non-pernicious weeds to go to flower. A group of UK growers have been developing this and have compared experiences of applying the technique.

Applicability box

Theme
Rotation, Cropping system, Learning, Field

Application time
Sowing in spring

Required time
Variable

Period of impact
Multiple years in case of perennial crops

Equipment
Labour, seed

Best in
Polytunnels and glasshouses in horticultural systems of varying scales

Benefits

The integration of flowering plants can enhance the population of pollinators and natural enemies to aid plant pollination and manage pests.

Practical recommendation

Flowering plants can be integrated into protected cropping in a number of ways. As tunnel space is valuable, finding plants with multiple functions can be a useful approach. It is worth noting that mixtures can become competitive in certain parts of the crop rotation – such as low growing leafy crops - in which case it is possible to cut them or tie them back, whereas for crops such as tomatoes and peppers the wildflowers pose little competition.

Wildflower strips

- One approach is to **integrate wildflower mixed strips** (perennial, annual, or a combination of both) along the sides of polytunnels. These strips can be left to go to seed and be 'turned off and on' by lightly cultivating with a hoe.
- When considering mixes, include a diversity of species with different flowering forms (to attract different insects with different proboscis lengths) and combine early and later flowering species.

Picture 1- perennial wildflower strip in polytunnel, Abbey Home Farm, UK in March 22

Seek to include species which provide:

1. **Pollen** (important protein source when usual prey is not abundant– e.g., corn marigolds for lacewings, brassicas and grasses)
2. **Floral nectar** (e.g. coriander and buckwheat – it is important to ensure a continuous supply)
3. **Extra floral nectar** (e.g cornflower, vetch and calendula)
4. **'Banker' species** which can host pests – distracting pests from the cash crop while providing banks of pests to attract and provide habitat for their natural enemies (e.g. nettles, yarrow and grasses). Particularly valuable species in protected cropping include field scabious and yarrow (attractive to bees, butterflies and parastic wasps) oxeye daisy and cornflower (valuable sources of floral and extra floral nectar). Some wildflower species have been found to be more attractive to beetle pests than beneficials and may be best avoided e.g., primula, red campion and cranesbill.

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- Although wildflower strips can take up to 20% of the growing space of the tunnel, the benefits for pest control can be significant. Note that permanent strips can take a while to establish but you will see the benefits down the line. They can get very grassy and you may need to reintegrate some flowering species. Consider the labour cost for establishing and managing the crop.

As such, setting aside year long tunnel space for wildflowers does not suit all growers' systems. But there are other creative ways to enhance flowering resources in the tunnels over the season:

Picture 2-Perennial wildflower strip across middle and sides of poly-tunnel, Abbey Home Farm, UK

- **Attract predators early in the season**

Focus on developing a strategy to ensure there is nectar in the tunnel as early in the season as possible. This can help give the best chance of addressing pest problems as soon as they emerge. Early flowering species such as poached egg plants and overwintered coriander are especially good for attracting in hoverflies onto spring beans and kale.

- **Leave patches of crops to go to flower**

For example, coriander, mustard and other brassicas. This does not need to be whole beds; patches grown near the tunnel entrance and / or along the sides of tunnels will attract beneficials in.

- **Encourage non-pernicious weeds**

Weeds such as mayweed, knotweed, chickweed and dead nettles can be left to go to flower inside the tunnel and provide pollen and nectar to attract beneficials into the tunnel.

- **Grow attractive perennials such as lavender**

Lavender attracts many beneficial pollinating insects and can be planted outside the entrances of tunnels.

- **Minimise mowing of grasses and nettles around tunnels**

Tufts of grass and nettles can be bankers for pests and their natural enemies. Nettles can be important banker plants for aphids and for allowing ladybirds to overwinter – it is then possible to move the larvae directly onto crop plants when required.

- **Integrate edible flowers and perennial herbs in to your cash crops**

Flowers such as poached egg plants, calendula, nasturtium, borage, violets and cornflower can also be harvested for sale with salad crops or dried to make into teas - to maximise on the economic use of space. Perennial herbs such as oregano and rosemary are particularly attractive to pollinating insects. Peppermint has been found to be beneficial in attracting predatory insects to control spider mite in cucumbers and tomatoes.

Further information

Further readings

- Bringing in the bugs https://www.agricology.co.uk/resources/bringing-bugs
- Plants that are valuable for bees and other insect pollinators https://www.agricology.co.uk/resources/plants-are-valuable-bees-and-other-insect-pollinators
- Companion planting and insect pest control https://www.researchgate.net/publication/285189207_Companion_planting_and_insect_pest_control
- Manage insects on your farm: A guide to ecological strategies https://www.academia.edu/25571051/MANAGE_INSECTS_On_Your_Farm_A_Guide_to_Ecological_Strategies_MANAGE_INSECTS_On_Your_Farm_A_Guide_to_Ecological_Strategies?email_work_card=title

About this practice abstract and DiverIMPACTS

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Project website: www.diverimpacts.net

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