# How To:

# Annual Flower Strips

**August 2024 / version 1**

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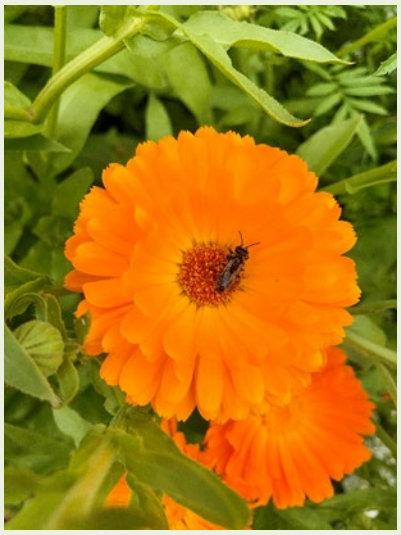
## Summary:

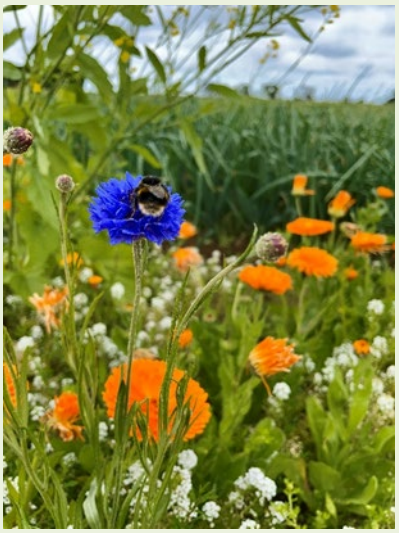
A “how to” guide on implementing Annual Flower Strips to increase on-farm biodiversity. This guide covers: how to plan, select species, sowing considerations, and ongoing weed control and maintenance. Also included are tips to help engage and educate your teams, record keeping, and some common pitfalls to avoid.


## Introduction

The goal of implementing annual flower strips on your farm is to enhance plant diversity across your block and property, increasing the diversity of natural enemies to assist in pest control. These plantings aim to provide a substantial amount of floral resources during the main pest season for your vegetable crops, typically from mid-spring through to late autumn.

The specific plants you choose, along with their placement and timing, will vary based on your unique conditions, involving some trial and error as you discover what works best. However, you will quickly see the benefits as the increased presence of natural enemies and pollinators not only demonstrates the value of these initiatives but also guides you toward optimizing plant mixes in future plantings.





## Planning your planting

Start by assessing your vegetable cropping plan to determine when and where you need the annuals, and identify the most effective sowing dates for the annuals based on their flowering times to align with your crop’s pest control needs. Early spring (Sep/Oct) is usually a good time to sow; with the right mix, you should achieve flowering within 3-5 weeks through to late autumn.

Next, consider the spacing between inter-rows, as it is suggested that some natural enemies travel only up to 15 metres from a floral resource into the crop. Design your plantings to facilitate this insect movement. You can achieve this by using full beds or adapt your plantings by sowing into wheel tracks that are not frequently used. Another option is to sow into spray rows, where frequent machinery movement may have reduced produce quality.

Also, consider integrating other floral resources such as native plants or annual flowers in moveable pods to ensure a cohesive plan for your block.  For more information on using pods, please refer to the biodiversity project page which includes resources and information about using moveable pods.

Ensure that your plantings are applied in a practical manner and arrange them to avoid interference with routine operations like spraying. Consider placing them outside the reach of your spray boom or along designated spray rows to minimize the need for frequent adjustments of spray nozzles.  Many boom sprayers provide for the nozzles, or sections of nozzles, in the spray row to be turned off, reducing the impact of spray application on beneficials living in the floral strips in spray rows.

### Selection of plant species

There is no set rule for which species to include—the greater the diversity, the better—but your choices can be guided by:

- Your own previous experience with different species.
- Availability of species in your region.
- Compatibility with your crop plant families to ensure synergy within your agricultural ecosystem (e.g. avoiding shared pests and diseases).
- Flowering duration, to provide continuous support to the ecology in your crops throughout the growing season.
- Avoidance of species known to be weedy or problematic in your area or crop, to prevent management challenges.
- Further research on species that can specifically benefit the natural enemies of the pests in your crops. A good place to start is the Plant-SyNZ website.
- Proximity to seed production areas, being cautious to avoid unintended cross-pollination.

A basic guide for species selection suited to a temperate climate region like Pukekohe is available in the "Annual Strips" section of the A Lighter Touch resource *Biodiversity Planting on Vegetable Farms*.

For additional insights into days to flowering and climatic factors like frost and summer temperature tolerance that affect annual germination and survival, consult local plant nurseries or seed catalogues such as King Seeds, Egmont Seed Company and Cover Crops.

**Consider integrating other floral resources such as native plants or annual flowers in moveable pods**

**Avoid species known to be weedy or problematic in your area**

## Sowing rates

To determine the appropriate sowing rates, start with online calculators that offer suggested rates, or refer to recommendations from local plant nurseries and seed catalogues. Resources available include King Seeds, Egmont Seed Company and Cover Crops.

After sowing, monitor germination around 7 days later. If you notice poor germination of annuals, consider over-sowing again. If significant weed emergence is observed, re-sowing may be necessary to achieve optimal density.

In areas with a high weed burden, such as Pukekohe, we used the following sowing rate mix:

| Annual Species | Rate – kg/ha |
|---|---|
| Alyssum | 4.0 |
| Buckwheat | 26.3 |
| Calendula – Nova | 3.3 |
| Cornflower – Dwarf Blue | 0.5 |
| Marigold | 1.3 |

These rates are tailored to ensure adequate ground cover and effectively suppress weed growth. However, the specific rates that work best may vary depending on your local conditions and specific crop needs.

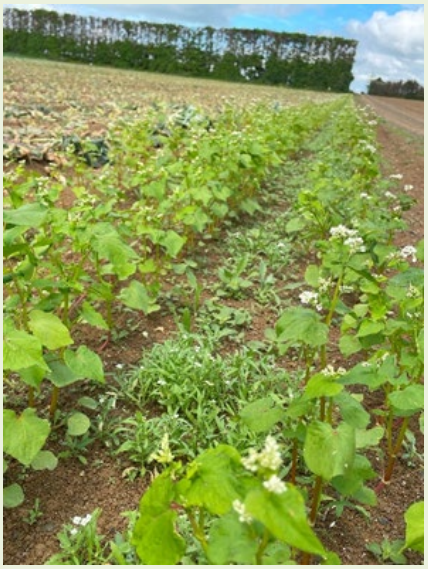
## Sowing

Utilize any suitable equipment available, such as manual scattering, hand seed spinners, or mechanical planters. Ensure even distribution across the sown area, paying special attention to the uniform spread of seeds of vastly varying sizes. Mixing seeds with dry coarse sand or other dry media can aid in achieving a more consistent distribution.

After sowing, the seeds will need to be lightly covered to protect them from birds. A light disturbance of the soil after sowing can help provide sufficient cover to deter birds and ensure good soil contact for seed germination.

Water is crucial after sowing to initiate germination, so ensure adequate moisture either through timely rainfall or irrigation.

**Useful websites linked in this resource:**
https://a-lighter-touch.co.nz/our-projects/biodiverse-planting/
https://www.kingsseeds.co.nz/
https://egmontseeds.co.nz/
https://covercrops.co.nz/
https://plant-synz.landcareresearch.co.nz/SearchForm.aspx



Above: Annual seed germination rates in the top image are at levels to give weed control; annual seed germination rates in the bottom image are not enough to keep weeds under control (16 November 2022).

Below: Five species annual flower mix, showing good canopy coverage for weed control and mixed flowers (15 December 2023).

## Weed control and maintenance

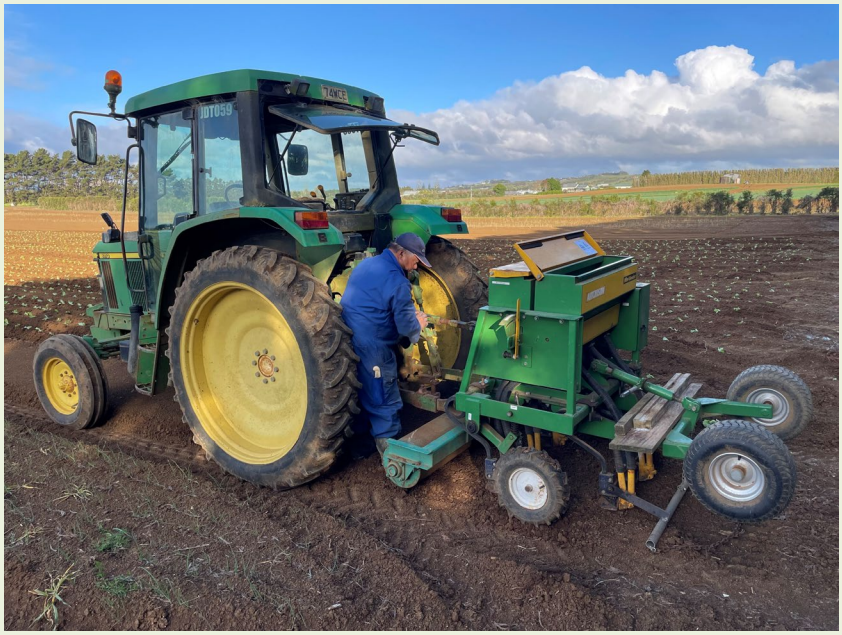
With mixed species, it is unlikely that selective herbicides will be an option so early weed control will be dependent on the stale seedbed technique.  Prior to planting, ensure that the beds are free from weeds. If necessary, apply Total Vegetation Control herbicides up to just before the first emergence of the flower mix to keep the seedbed weed-free. Once the plants are established, rapid germination and sufficient seedling emergence will contribute to canopy growth, which naturally suppresses weeds.

Keep the annual flower strips free from direct applications of herbicides, insecticides, or fungicides. Minimize drift from adjacent beds that are being sprayed.

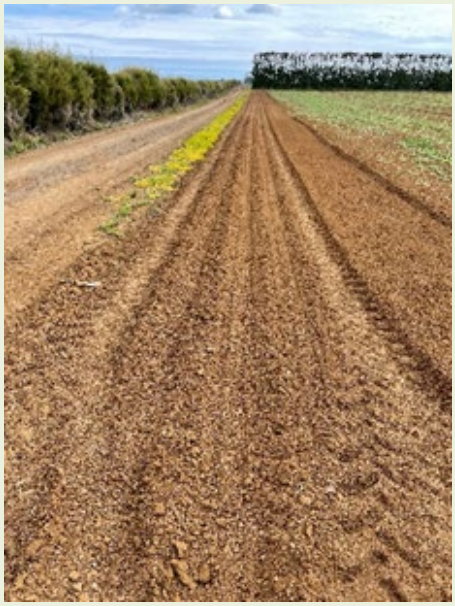
Leave the annual flowers in the ground until the end of the crop cycle or until they finish flowering, depending on the season. Afterward, till the ground as you prepare for the next crop. Although the species in the mix may not naturally reseed in sufficient volumes to suppress weeds effectively, under your specific conditions you might find that the rows can self-seed and provide continuous coverage.

## Engage and educate your team

Educate your farm staff about the benefits of the floral strips and actively involve them from the beginning. It is crucial that everyone involved understands the location and importance of these floral areas to prevent accidental damage during routine operations. Clearly mark these areas and provide regular updates and training sessions to help staff adjust to these new elements on the farm. Be prepared for some initial hiccups as everyone learns to integrate these practices effectively.



Preparing the planter for sowing the annual flower rows.

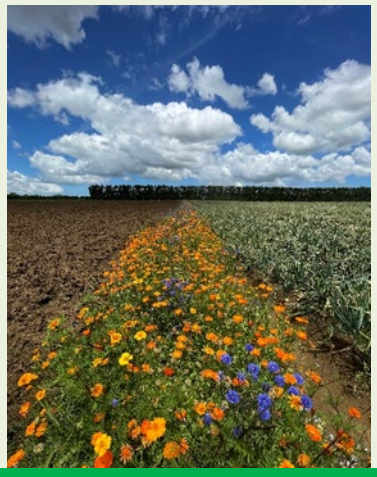


Annual seed beds sown mechanically with soil coverage (11 October 2022).

**Educate your farm staff – provide regular updates and training sessions**

### Refinement and record-keeping

Keep detailed records of sowing dates, species used, germination success, and flowering periods. Use this data to refine your approach each year, adjusting sowing dates and species mixes based on performance and environmental conditions. This practice of continuous improvement will help optimize the benefits of annual flower strips in supporting your farm's ecosystem. To effectively track your progress, consider using a spreadsheet. You can find an example tracking spreadsheet on the biodiversity project page.



Above: Five species annual flower mix (4 January 2024)

## Common pitfalls to avoid:

Waiting: Don't wait to develop a perfect mix before starting; early mistakes provide invaluable learning opportunities.

Inadequate Watering: Make sure that planted seeds are adequately watered to support successful germination.

Exposing Your Seeds: Ensure that sown seeds are covered to protect them from birds and improve germination rates.

Not Educating Your Team: Fully inform your team about the locations of the plantings and their importance to prevent accidental damage and ensure the success of your biodiversity efforts.

Starting Large: Start small to learn and adapt. This way if there are unintended consequences such as an annual species becoming weedy in your situation, it remains within a controllable area.

## Acknowledgements:

Special thanks to Olivia Prouse (Cropping Services Ltd) for her time and dedication to the A Lighter Touch Biodiversity Project, and her knowledge and expertise in producing this How to guide. Thanks to Balle Brothers, Pukekohe, for hosting the trial site, including the hard work of Howe Young. Thanks to all the growers and wider industry for visiting the site and taking part in discussions.

## For more information:

Please visit the project page on the A Lighter Touch website by scanning the QR code or visiting https://a-lighter-touch.co.nz/our-projects/biodiverse-planting/

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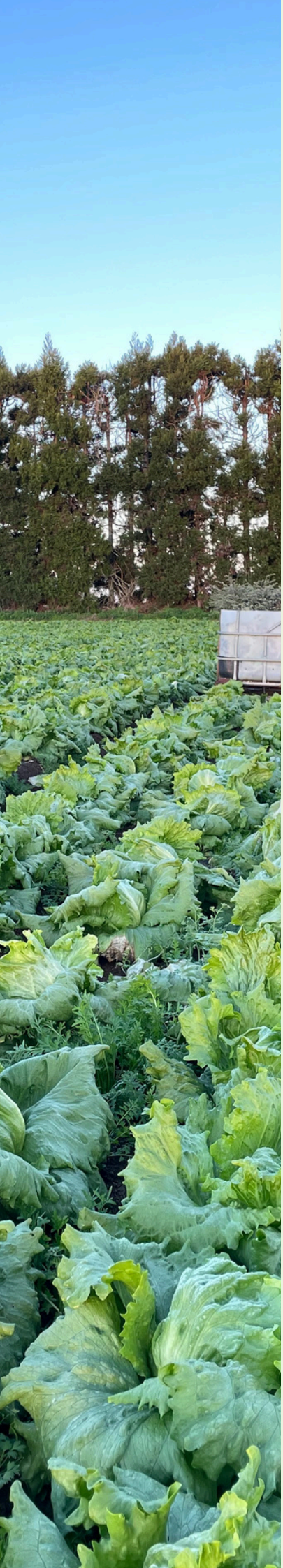

# Other ‘how to’ guides

## The cover crop guide – here

A “how to” guide on implementing cover crops on your farm. This guide covers: planning, species selection, sowing rates, and maintenance. Also included are tips to help engage and educate your teams, record keeping, and some common pitfalls to avoid.

## The mobile insectaries guide – here

A “how to” guide on implementing mobile insectaries on your farm. This guide covers: planning, species selection and configuration, insectary construction, and monitoring and maintenance of insectary plantings. Also included are tips to help engage and educate your teams, record keeping, and some common pitfalls to avoid.

# Other related resources

## The plant species list – here

Planted to provide year round food sources, and shelter for the beneficial insects over winter. The species were also selected based on full growth size in order to avoid impeding machinery and minimise maintenance e.g., trimming.

## Biodiverse planting on vegetables farms project – here

This project is designed to show manipulation of plant diversity on a farm can increase beneficial insect numbers and reduce the pests in a crop, meaning less use of insecticides is required.

Linked on this page are many other resources relating to this biodiversity project, including crop case studies sharing the crop protection approach taken in successfully harvesting vegetable crops using integrated pest management and biodiversity as key strategies.