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PRACTICE INSIGHTS

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Industry needs matter—Incorporating stakeholder interests in the selection of flower resources to support pollinators

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Abstract

1. Most pollinator policy initiatives are focused on habitat restoration and increasing the availability of floral resources, yet the choice of plant species is not always compatible with farming system cultivation and management needs.
2. In this paper, we developed a framework for selecting plants to specifically meet stakeholder needs. We trialled 19 plant species and collected observational data on plant-insect visitors, plant survival in the orchard environment and potential risks to crops and the environment. We used this framework to identify plants suitable to incorporate into blueberry cropping systems.
3. *Practical implication*: Our framework ensured plant choice based on informed decisions and allowed the selection of two plant species that aligned well with industry needs. Different plants may be optimal for different conservation aims, hence plants selected need ideally to be evaluated for their use by the flower-visiting taxa, as well as align with industry growing practices and needs.

KEYWORDS
floral identity, framework, industry, perennial crop systems, plant selection, pollination services, pollinators

1 | INTRODUCTION

The conservation of pollinators, and of the pollination services they provide, is a major issue for stakeholders worldwide (IPBES, 2016). This has led to the establishment of several regional, national and international pollinator initiatives, and subsidised pollinator-friendly management schemes to support pollinators on agricultural land (Dias et al., 1999; Haaland et al., 2011; Requier & Leonhardt, 2020). Many initiatives advocate increased flower food resources for pollinators, which can be implemented through planting flower strips in field margins, flowering cover crops as part of crop rotations, intercropping of flowering plants with crops and/or increasing plant (flower) richness in grassland seed mixes (Garibaldi et al., 2014; Griffiths-Lee et al., 2020; Hodgkiss et al., 2019; Mallinger et al., 2019; Orford et al., 2016). These flower plantings aim to provide food and shelter for beneficial arthropods, such as pollinators and pest control agents.

While several studies have demonstrated that increased floral resources generally increase the abundance and diversity of wild pollinators and pest-suppressing insects in agricultural landscapes (Albrecht et al., 2020; Lowe et al., 2021), specific insects do not forage upon all available flower types (Lundin et al., 2019; Sutter et al., 2017; Wood et al., 2017). Many different plant species are selected in floral plantings to support native biodiversity, manage honeybee health, increase crop pollination services, or other ecosystem services (e.g. biocontrol, water retention, nutrient regulation; M'Gonigle et al., 2017; Senapathi et al., 2015; Sutter et al., 2017). Plant identity in flower plantings is thus a critical component of decision-making to ensure the species selected not only support pollinators or services but also fit within the cropping system managed by the industry. Yet, few initiatives explicitly align floral choice with the goals, management needs and safety precautions needed by industry stakeholders (Pywell et al., 2011; Wood et al., 2017).

Pollinator habitat enhancement initiatives are often broadly focused on pollinator conservation objectives, which in some cases, may not result in positive gains for crop production—a primary objective for industry when undertaking floral resource enhancement (Albrecht et al., 2020; Lowe et al., 2021). For example, some plant species may result in disservices to crop production as they attract crop pests (Tschumi et al., 2018). Crop pollination may also be negatively impacted if floral resource addition results in pollinator dilution (Nicholson et al., 2019), or if selected co-flowering species facilitate the establishment of crop pollinator pathogens (Adler et al., 2021). Despite this, pollinator conservation objectives are not mutually exclusive with goals to enhance crop productivity. Achieving these combined goals will likely require more rigorous plant selection targeted to (i) sustain both wild and managed crop pollinators and (ii) ensure compatibility with industry needs (Garibaldi et al., 2014). These industry needs will often be crop-specific but encompass considerations such as flowering plant establishment success and maintenance costs, compatibility with horticultural practices and agricultural inputs, as well as environmental and human health risks (e.g. plant invasiveness or allergies) posed by the introduction of additional plant species.

Flower plantings may facilitate crop pollination by increasing pollinator abundance, diversity and health, or through plant magnet effects when pollinators spill-over from attractive co-flowering plants onto crops (Braun & Lortie, 2019). It follows that in order to enhance crop pollination through flower plantings, pollinators should be shared between the added plant species and the crop. Using direct floral visitation observation records as a means to identify the co-flowering plants already utilised by insects is, therefore, a critical component in selecting the best possible plant taxa for floral plantings (Howlett et al., 2021). In addition to selecting plants with high visitation frequencies of shared pollinators, selected plant species should complement the nutritional rewards of crops (Filipiak et al., 2017). Pollen provides many of the essential nutrients required for bee growth and development, and for generalist bees such as honeybees, a diverse pollen diet is considered important for colony health (Bonoan et al., 2020). Yet, many crops are cultivated in monocultural systems and are reliant on migratory beekeeping for crop pollination services, restricting the diversity of pollen forage available to these managed bees (Bonoan et al., 2020). While it is important to have continuous floral resource availability to support wild pollinator populations (Grab et al., 2017), supporting managed bees in monocultural cropping systems will likely require diversifying pollen sources over the period of crop bloom when the managed bees are present. Although there is a growing evidence base to support these broad management recommendations, there is a growing need for more case studies and guides to be available to the industry to help navigate the often-complex task of initiating floral resource enhancement projects, of which plant selection is a major consideration.

Here we present a two-phase framework, developed in consultation with industry, to inform plant selection for supporting crop pollinators. We conducted trials for 19 plant species to specifically select plants that met industry stakeholder needs within a commercial perennial blueberry crop system. Informed through the consultation process with industry, and considering lessons learned, we provide a step-by-step plant selection guide applicable to other systems and contexts (Figure 1).

2 | METHODS

2.1 | Study system

We conducted plant selection trials in blueberry blocks at Costa's berry farm in Coffs Harbour, Australia. Costa berry farm permitted us to carry out the field study. Blueberry, a globally important food crop, is known to exhibit reduced yields when insect floral visitation and cross-pollination is infrequent (Benjamin & Winfree, 2014). In the study system, southern highbush blueberry (*Vaccinium corymbosum*) is cultivated in substrate (potted plants) or soil and grown in partially enclosed polytunnels (Figure S1) or in open blocks. Insect visitation to blueberry flowers, and subsequently yield, can be negatively affected by polytunnels, which are increasingly used for blueberry cultivation (Hall et al., 2020). Blueberry provides both pollen and nectar rewards, and while the dominant pollinators in Eastern Australia (honeybees, *Apis mellifera*, and stingless bees, *Tetragonula carbonaria*; Kendall et al., 2020, Samnegård et al., 2023) frequently collect blueberry nectar, pollen collection is more infrequent and varies over the blooming season, possibly due to its low protein content (Samnegård et al., 2023; Somerville, 2005). Flowering of southern highbush blueberry at the study site primarily occurs from March (austral autumn) to September (austral spring).

2.2 | Industry aims and needs

The blueberry industry partner had two major aims for adding floral resources into this system: (1) to increase the activity of pollinators throughout the blueberry rows in polytunnels and (2) to support the health of managed honeybees and wild stingless bees. To meet industry needs, specific selection criteria were identified to ensure compatibility with farm management practices. Firstly, the selected flowering plants needed to cope with the

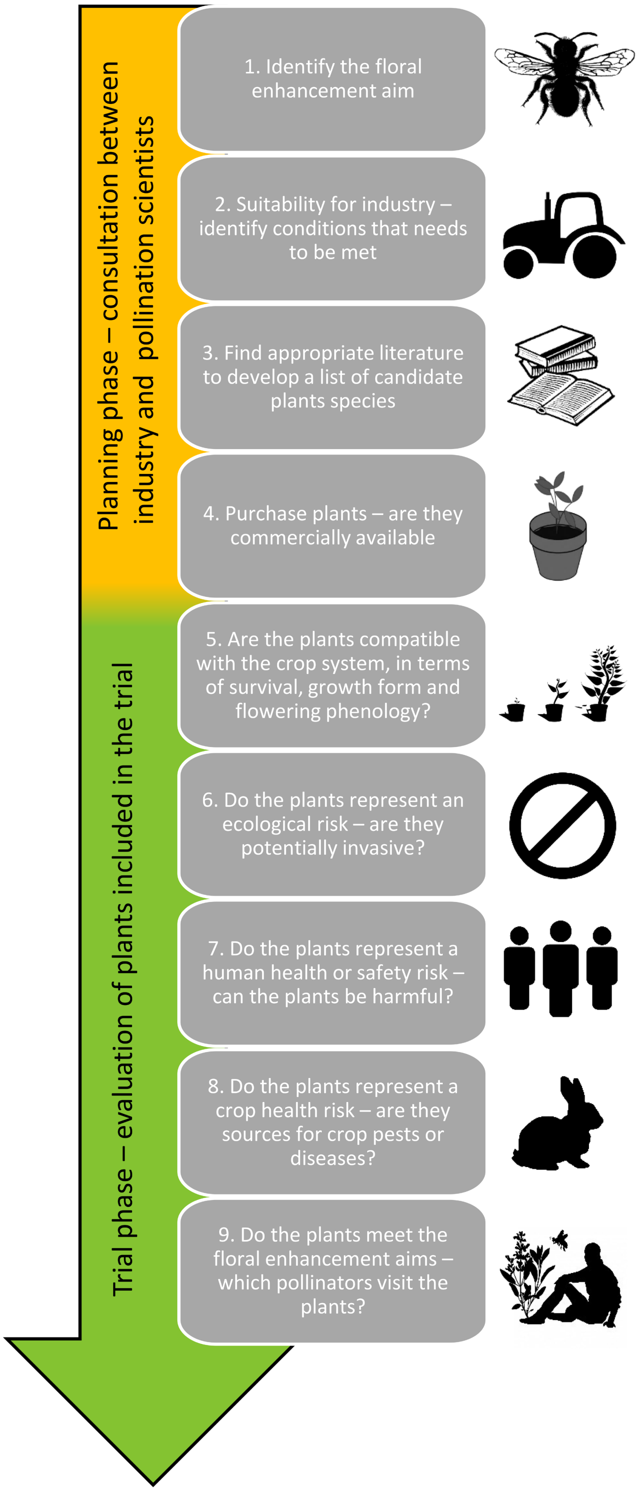

FIGURE 1 Nine-step prioritisation framework for selecting suitable plants to incorporate into crop systems. These steps have been developed for an evergreen blueberry system but its applications could be tailored for any agroecosystem for which plants are specifically considered for pollinators and crop production. All images are from the public domain.

management regime used for blueberries (e.g. watering regime, pruning and spraying practices, and in particular, a highly acidic substrate), have a low stature to avoid shading of blueberry plants and be perennial to minimise maintenance costs. Secondly, plants needed to have synchronous flowering with blueberry over the austral winter, a season when comparatively few plant species are in bloom, and thirdly, plants needed to have accessible pollen to increase pollen availability in the system (Figure 1, steps 1–2). Additional criteria were identified as likely being more broadly relevant across a range of cropping systems. These included risks of crop pest or pathogen facilitation, risks to the environment, such as exotic invasiveness, and risks to personnel, such as plant defences (e.g. spines).

2.3 | Candidate trial plants

The first phase of plant selection concerned sourcing candidate plant species for a field trial. A list of potential plants was collated using existing reference sources on pollinator-enhancing plants together with expert advice from local plant nurseries and industry partners, with emphasis placed on identifying plants that meet the industry-specific needs (Leech, 2012; Somerville, 2005). Plants that were invasive or weedy in Australia were regarded as unsuitable and disregarded from the list (Department of Primary Industries, n.d.). The availability of seedlings and plants held in stock by a national plant distributor further filtered the plant list, which resulted in 19 plant species that were commercially available in the study region (Figure 1, steps 3–4; Table S1).

2.4 | Observations

For the second phase of the plant selection process, potted candidate plants species were purchased and transplanted into the blueberry growth media used at the trial site. Plants were positioned randomly at the end of blueberry rows in polytunnels or in an open blueberry orchard block and were connected to the irrigation system used for blueberry watering and fertilisation. Following plant establishment in the blueberry system in May 2019, we conducted regular observations of plant health, stature and potential risk factors to personnel or management practices. In the year following plant establishment, we conducted standardised observations of floral insect visitors on the 36 plants, representing 11 species, that had survived in the system and co-flowered with the blueberry plants (Table S2). The aim of the standardised observations in field trials was to record the actual identity and number of visitors that visited the different plant species and what type of resources they collected (nectar and/or pollen). The observations were conducted both in polytunnels (March 2020, approximately 10 months after establishment) and in open field blocks (March–May 2020). Individual plants were observed for 5 min, and all floral visitors were recorded, together with the number of open flowers. We conducted 8 separate days of observations in the polytunnels and 5 days of observations in the open block. Final plant choice was guided by the outcome of each step in the framework (Figure 1, steps 1–9).

2.5 | Statistics

We modelled the number of visitors to candidate plants using generalised linear mixed effect models with the glmmTMB package (Brooks et al., 2017) in R (R Core Team, 2017). Random effects reflected experimental design, with the effects of plant location nested within row, and the crossed effects of observation date. The natural logarithm of the mean number of flowers for each plant species was used as an offset. Models were specified with a negative binomial error distribution following model diagnostics implemented with the DHARMa package (Hartig & Hartig, 2017). Separate models were fitted for honeybees, stingless bees, and for all visitors combined. Due to low visitation to some plant species, only plant species receiving greater than one floral visit in aggregate were included in the models. Pairwise testing was performed using the emmeans package (Lenth & Lenth, 2018).

3 | RESULTS

Experimental trials deemed several plant taxa unsuitable as a result of the conditions of blueberry management, evidenced by signs of stress (leaf yellowing), slow growth rate and/or wilted leaves, or death (Figure 1, step 5, Table S1). Other plants were deemed unsuitable due to their climbing habit (*Hardenbergia violacea*), abundant wind-dispersed seeds (*Gazania splendens*) or trailing growth form (*Carpobrotus glaucescens* and *Mesembryanthemum cordifolium*; Figure 1, steps 5 and 6, Table S1). Plants with defences that caused discomfort for farmworkers, like *Grevillea* spp. with its spine-tipped leaves, or *Geranium* with its strong fragrance, were also found to be unsuitable (Figure 1, step 7, Table S1). Some culinary plant species were excluded as they were found to be attractive to mammal pests such as rabbits and were grazed or dug out (e.g. *Rosemarinus officinalis*). None of the plants included in the trial resulted in insect pest pressure of concern to blueberries (Figure 1, step 8, Table S1).

3.1 | Visitation records

We recorded a total of 1161 visitors to the candidate plants across 24.2 hours of observations. Honeybees were the most frequent visitors (48%), followed by stingless bees (34%), Muscidae flies (6%), Syrphidae (hoverflies; 6%) and other taxa (6%). Honeybees regularly visited about half of the plant species included in the insect visitor observation trials, whereas only two plant species received regular visits by stingless bees (Figure 1, step 9; Figure S2). Plants receiving visits by stingless bees had a much higher total number of visits compared to plants mainly visited by honeybees (Figure S2). Other taxa occasionally visiting the trial plants in polytunnels were blue-banded bees (*Amegilla* sp.), Calliphoridae, Muscidae, Chloropidae, Sarcophagidae, Syrphidae and moths (Table S2). The number of flowers per trial plant varied considerably between species, from an average of 19 flowers of the composite *Gazania splendens* to an average of 270 flowers of *Pentas lanceolata*. Overall, *M. cordifolium* and *Ocimum basilicum* were the most attractive species, which received significantly more stingless bee and honeybee visitors than several other candidate plant species (floral visitor models results are provided in Figures S3–S5). There was no statistically significant differences in the number of floral visitors under polytunnels compared to open blocks. When comparing the other taxa visiting the trial plants, Diptera (Muscidae and Syrphidae) were more common visitors of *C. hyssopifolia* in the open block, and blue-banded bees were only observed visiting plants in the polytunnels (Table S2). For all plants, Syrphidae were only observed once in the polytunnels, compared to 65 times in the open block (Table S2).

3.2 | Final plant choice

Most of the trial plants had both strengths and weaknesses and hence decisions were made based on industry priorities (Table S1). High priority was assigned to ecosystem, farm workers and crop system safety, so plants that posed any risk of becoming harmful (Figure 1, steps 6–8) were discarded. *C. hyssopifolia* was selected since it was the only plant species that did well on all steps 5–8 (Table S1) in the trial phase, and was visited frequently by honeybees. Moreover, *C. hyssopifolia* was also visited by other pollinating taxa, such as Syrphidae, which was considered a benefit (Table S2). However, *C. hyssopifolia*, was rarely visited by stingless bees and since this taxon were a priority group for the industry, we decided to also include a plant species specifically used by them. Hence, the second plant selected was *Ocimum basilicum*, which was frequently visited by stingless bees, and also did well on all steps 5–8 (Table S1), despite taking a longer time to establish in the blueberry system (Table S1).

4 | DISCUSSION

In this study, we found that several plants were potentially deemed suitable if the only factor considered was visitation by insect pollinators (Figure S2). However, when these plants were considered for all traits beyond floral visitation, many were found to be unsuitable and incompatible with industry needs. For example, some plants were repeatedly visited by mammal pests, evidenced by the plants being grazed or dug out from their pots. Visiting birds and mammals can cause serious problems in crop systems, including the risk of spreading foodborne pathogens (Eckert & Deplazes, 2004; Smith et al., 2020), crop damage, and potential hazards for farm workers. As a consequence, and precaution, plants attractive to vertebrate pests were not considered suitable for the crop system.

Moreover, the agronomic practices for the plants need to match the practices for the crop plants and not add unnecessary additional labour. We included a criterion for selection of low stature plants at the planning phase; however, in the course of the experiment it became apparent that some of the plant's growth forms could pose a risk for the blueberry production, such as the scrambling *H. violacea* that started to shade the blueberry plants, or the trailing *C. glaucescens* and *M. cordifolium* that grew out into the blueberry rows causing concerns in regard to row maintenance. The potential extra workload made them unsuitable for the system.

The candidate plant species included in this study were shortlisted for their potential attractiveness to local blueberry pollinators; however, at the time of the study, information on their attractiveness to stingless bees was lacking in the literature. This necessitated pollinator visitation observations to ensure the desired objective to support blueberry pollinators in the study system was being met. It is worth noting that the framework presented (Figure 1) can be applied in some cases without the need for pollinator visitation observations, simplifying the evaluation process. Data relating to the compatibility of selected plant species to existing agricultural management practices would be the only additional data required in regions and crop systems with available plant-pollinator interaction studies.

Industry engagement and consultation with stakeholders is crucial to ensure long-term uptake and investment in conservation actions, especially in countries that do not provide political subsidies for such measures. Hence, it is important to involve and consult stakeholders in the evaluation process of priorities and trade-offs of different strategies. When focusing on conservation actions aiming at supporting crop pollinators, plant species choice is critical and the best choice for pollinators may not always be the best choice for industry needs. By evaluating conservation aims together with industry needs and concerns, following our presented framework, plant choice will be based on informed decisions that are well aligned with industry needs. Besides plant choice, further evaluations are required to determine the most appropriate layout for the plantings, if pollinator health is improved by the flower enhancement and if the floral enhancement improves pollination success/fruit set in these systems. It is likely that priorities and trade-offs will differ depending on aims, crop system and region, hence local evaluations of suitable plants are needed.

AUTHOR CONTRIBUTIONS

Ulrika Samnegård and Romina Rader conceived the project. Maurizio Rocchetti provided the industry input and facilitated the fieldwork. Ulrika Samnegård, Romina Rader, Jeremy Jones and Emma Goodwin collected the data. Ulrika Samnegård, Karen C. B. S. Santos, and Jeremy Jones compiled and analysed the data. Ulrika Samnegård and Romina Rader wrote the first draft of the paper. All authors contributed feedback to manuscript drafts and gave approval for publication.

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CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

PEER REVIEW

The peer review history for this article is available at https://www.webofscience.com/api/gateway/wos/peer-review/10.1002/2688-8319.12383.

DATA AVAILABILITY STATEMENT

The data along with the analysis code is publicly available in the Dryad Digital Repository: https://doi.org/10.5061/dryad.1c59zw456 (Samnegård et al., 2024).

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REFERENCES

Adler, L. S., Irwin, R. E., McArt, S. H., & Vannette, R. L. (2021). Floral traits affecting the transmission of beneficial and pathogenic pollinator-associated microbes. *Current Opinion in Insect Science*, *44*, 1–7. https://doi.org/10.1016/j.cois.2020.08.006

Albrecht, M., Kleijn, D., Williams, N. M., Tschumi, M., Blaauw, B. R., Bommarco, R., Campbell, A. J., Dainese, M., Drummond, F. A., & Entling, M. H. (2020). The effectiveness of flower strips and hedgerows on pest control, pollination services and crop yield: A quantitative synthesis. *Ecology Letters*, *23*, 1488–1498.

Benjamin, F. E., & Winfree, R. (2014). Lack of pollinators limits fruit production in commercial blueberry (*Vaccinium corymbosum*). *Environmental Entomology*, *43*(6), 1574–1583. https://doi.org/10.1603/EN13314

Bonoan, R. E., Gonzalez, J., & Starks, P. T. (2020). The perils of forcing a generalist to be a specialist: Lack of dietary essential amino acids impacts honey bee pollen foraging and colony growth. *Journal of Apicultural Research*, *59*(1), 95–103. https://doi.org/10.1080/00218839.2019.1656702

Braun, J., & Lortie, C. J. (2019). Finding the bees knees: A conceptual framework and systematic review of the mechanisms of pollinator-mediated facilitation. *Perspectives in Plant Ecology, Evolution and Systematics*, *36*, 33–40. https://doi.org/10.1016/j.ppees.2018.12.003

Brooks, M. E., Kristensen, K., van Benthem, K. J., Magnusson, A., Berg, C. W., Nielsen, A., Skaug, H. J., Mächler, M., & Bolker, B. M. (2017). glmmTMB balances speed and flexibility among packages for zero-inflated generalized linear mixed modeling. *The R Journal*, *9*(2), 378. https://doi.org/10.32614/RJ-2017-066

Department of Primary Industries. (n.d.). *NSW WeedWise*. https://weeds.dpi.nsw.gov.au/

Dias, B. S. F., Raw, A., & Imperatri-Fonseca, V. L. (1999). *International Pollinators Initiative: The São Paulo Declaration on Pollinators. Report on the recommendations of the workshop on the conservation and sustainable use of pollinators in agriculture with emphasis on bees*. Brazilian Ministry of the Environment (MMA).

Eckert, J., & Deplazes, P. (2004). Biological, epidemiological, and clinical aspects of echinococcosis, a zoonosis of increasing concern. *Clinical Microbiology Reviews*, *17*, 107–135.

Filipiak, M., Kuszewska, K., Asselman, M., Denisow, B., Stawiarz, E., Woyciechowski, M., & Weiner, J. (2017). Ecological stoichiometry of the honeybee: Pollen diversity and adequate species composition are needed to mitigate limitations imposed on the growth and development of bees by pollen quality. *PLoS One*, *12*, e0183236. https://doi.org/10.1371/journal.pone.0183236

Garibaldi, L. A., Carvalheiro, L. G., Leonhardt, S. D., Aizen, M. A., Blaauw, B. R., Isaacs, R., Kuhlmann, M., Kleijn, D., Klein, A. M., & Kremen, C. (2014). From research to action: Enhancing crop yield through wild pollinators. *Frontiers in Ecology and the Environment*, *12*, 439–447.

Grab, H., Blitzer, E. J., Danforth, B., Loeb, G., & Poveda, K. (2017). Temporally dependent pollinator competition and facilitation with mass flowering crops affects yield in co-blooming crops. *Scientific Reports*, *7*, 45296.

Griffiths-Lee, J., Nicholls, E., & Goulson, D. (2020). Companion planting to attract pollinators increases the yield and quality of strawberry fruit in gardens and allotments. *Ecological Entomology*, *45*, 1025–1034.

Haaland, C., Naisbit, R. E., & Bersier, L. F. (2011). Sown wildflower strips for insect conservation: A review. *Insect Conservation and Diversity*, *4*, 60–80.

Hall, M. A., Jones, J., Rocchetti, M., Wright, D., & Rader, R. (2020). Bee visitation and fruit quality in berries under protected cropping vary along the length of polytunnels. *Journal of Economic Entomology*, *113*(3), 1337–1346. https://doi.org/10.1093/jee/toaa037

Hartig, F., & Hartig, M. F. (2017). Package 'DHARMa.' R package.

Hodgkiss, D., Brown, M. J. F., & Fountain, M. T. (2019). The effect of within-crop floral resources on pollination, aphid control and fruit quality in commercial strawberry. *Agriculture, Ecosystems and Environment*, *275*, 112–122.

Howlett, B., Todd, J., Willcox, B., Rader, R., Nelson, W., Gee, M., Schmidlin, F., Read, S., Walker, M., & Gibson, D. (2021). Using non-bee and bee pollinator-plant species interactions to design diverse plantings benefiting crop pollination services. *Advances in Ecological Research*, *64*, 45–103.

IPBES. (2016). *Summary for policymakers of the assessment report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services on pollinators, pollination and food production*. 978-92-807-3568-0. Secretariat of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.

Kendall, L. K., Gagic, V., Evans, L. J., Cutting, B. T., Scalzo, J., Hanusch, Y., Jones, J., Rocchetti, M., Sonter, C., Keir, M., & Rader, R. (2020). Self-compatible blueberry cultivars require fewer floral visits to maximize fruit production than a partially self-incompatible cultivar. *Journal of Applied Ecology*, *57*, 2454–2462.

Leech, M. (2012). *Bee friendly: A planting guide for European honeybees and Australian native pollinators*. Rural Industries Research & Development Corporation.

Lenth, R., & Lenth, M. R. (2018). Package 'lsmeans'. *The American Statistician*, *34*(4), 216–221.

Lowe, E. B., Groves, R., & Gratton, C. (2021). Impacts of field-edge flower plantings on pollinator conservation and ecosystem service delivery—A meta-analysis. *Agriculture, Ecosystems & Environment*, *310*, 107290.

Lundin, O., Ward, K. L., & Williams, N. M. (2019). Identifying native plants for coordinated habitat management of arthropod pollinators, herbivores and natural enemies. *Journal of Applied Ecology*, *56*, 665–676.

Mallinger, R. E., Franco, J. G., Prischmann-Voldseth, D. A., & Prasifka, J. R. (2019). Annual cover crops for managed and wild bees: Optimal plant mixtures depend on pollinator enhancement goals. *Agriculture, Ecosystems & Environment*, *273*, 107–116.

M'Gonigle, L. K., Williams, N. M., Lonsdorf, E., & Kremen, C. (2017). A tool for selecting plants when restoring habitat for pollinators. *Conservation Letters*, *10*, 105–111.

Nicholson, C. C., Ricketts, T. H., Koh, I., Smith, H. G., Lonsdorf, E. V., & Olsson, O. (2019). Flowering resources distract pollinators from crops: Model predictions from landscape simulations. *Journal of Applied Ecology*, *56*, 618–628.

Orford, K. A., Murray, P. J., Vaughan, I. P., & Memmott, J. (2016). Modest enhancements to conventional grassland diversity improve the provision of pollination services. *Journal of Applied Ecology*, *53*, 906–915.

Pywell, R., Meek, W., Hulmes, L., Hulmes, S., James, K., Nowakowski, M., & Carvell, C. (2011). Management to enhance pollen and nectar resources for bumblebees and butterflies within intensively farmed landscapes. *Journal of Insect Conservation*, *15*, 853–864.

R Core Team. (2017). *R: The R project for statistical computing*. R Foundation for Statistical Computing. https://www.r-project.org/

Requier, F., & Leonhardt, S. D. (2020). Beyond flowers: Including non-floral resources in bee conservation schemes. *Journal of Insect Conservation*, *24*, 5–16.

Samnegård, U., Jones, J., Santos, K., Goodwin, E., Rocchetti, M., & Rader, R. (2024). Flower visitor data from: Industry needs matter—Incorporating stakeholder interests in the selection of flower resources to support pollinators [Dataset]. *Dryad*. https://doi.org/10.5061/dryad.1c59zw456

Samnegård, U., Kendall, L. K., Brummell, M. E., Rocchetti, M., da Silva Santos, K. C. B., Smith, H. G., & Rader, R. (2023). Within-bloom shift in abundance of a wild pollinator mediates pollen deposition rates to blueberry. *Basic and Applied Ecology*, *72*, 64–73.

Senapathi, D., Biesmeijer, J. C., Breeze, T. D., Kleijn, D., Potts, S. G., & Carvalheiro, L. G. (2015). Pollinator conservation—The difference between managing for pollination services and preserving pollinator diversity. *Current Opinion in Insect Science*, *12*, 93–101.

Smith, O. M., Edworthy, A., Taylor, J. M., Jones, M. S., Tormanen, A., Kennedy, C. M., Fu, Z., Latimer, C. E., Cornell, K. A., Michelotti, L. A., Sato, C., Northfield, T., Snyder, W. E., & Owen, J. P. (2020). Agricultural intensification heightens food safety risks posed by wild birds. *Journal of Applied Ecology*, *57*, 2246–2257.

Somerville, D. (2005). *Fat bees skinny bees. A manual on honey bee nutrition for beekeepers* (pp. 1–142). Australian Government Rural Industries Research and Development Corporation.

Sutter, L., Jeanneret, P., Bartual, A. M., Bocci, G., & Albrecht, M. (2017). Enhancing plant diversity in agricultural landscapes promotes both rare bees and dominant crop-pollinating bees through complementary increase in key floral resources. *Journal of Applied Ecology*, *54*, 1856–1864.

Tschumi, M., Ekroos, J., Hjort, C., Smith, H. G., & Birkhofer, K. (2018). Predation-mediated ecosystem services and disservices in agricultural landscapes. *Ecological Applications*, *28*, 2109–2118.

Wood, T. J., Holland, J. M., & Goulson, D. (2017). Providing foraging resources for solitary bees on farmland: Current schemes for pollinators benefit a limited suite of species. *Journal of Applied Ecology*, *54*, 323–333.

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

Figure S1. Evergreen blueberry plants grown in substrate under partially enclosed poly tunnels.

Figure S2. Average number of visits by honeybees and stingless bees to the blooming trial plant species, combined for poly tunnel and open block observations.

Figure S3. Estimated marginal mean number of honeybee visitors to candidate plants.

Figure S4. Estimated marginal mean number of stingless bee visitors to candidate plants.

Figure S5. Estimated marginal mean number of all visitors to candidate plants.

Table S1. Evaluation of the plants included in our plant trial 3.5 months after establishment.

Table S2. Taxa visiting plants in plant trial during standardised observations (honeybees and stingless bees excluded, see Figure S2).

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