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Flowers as natural pest control agents

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ABSTRACT

In order to reduce the pesticide load on soil and environment, adoption of natural and biological pest control can make best alternative. Using flowers as natural pest control agent not only bring down the pest population but also helps in maintaining a healthy ecological balance. There are plenty of flower options available, which apart from beautifying the garden, can also attract the pollinators and keep invading pests away from the main crop. Therefore, a vivid knowledge regarding the potential flowers is a must for harnessing their pest deterring properties. This article covers the importance of using flowers as pest controlling agents and different flowers which can serve the purpose efficiently.

***Key words*:** Flowers, crop pest, natural pest control, environment safe

INTRODUCTION

Our surrounding is being enriched with many flowers which are known to possess properties that can attract beneficial insects or keep away detrimental insects. The beneficial insects such as ladybugs, praying mantises etc. prey on damage causing pest population whereas honey bees, butterflies, moths etc. serve as potential agent for effective pollination and fruit set. Exploiting flowers as natural pest control agents not only reduces the work pressure but also cuts down the amount of pesticides to be resorted. Lesser pesticide usage can lead to more beneficial bug population, which in turn assist in keeping the harmful bug population in check (Stakal, 2018). There is a saying that "what comes up well in my garden may not come well in yours". It is because every garden out there, avail a discrete growing climate, soil type and so also typical insect pests. Therefore flowers must be chosen which are native to the particular area in order to attract beneficial insects as they have been already acclimatized with the particular flowers.

Methods of using flowers for natural pest control:

A. Companion planting: Here flower plants are planted in the proximity of the main flower or vegetable crops with an aim of deterring harmful pests by their typical odour. They are also reported

to attract a good number of beneficial insects to the garden, which either aid in the pollination mechanism or act as a predator for other damage causing pests.

B. Trap crop: Flowers can be used as trap crop for attracting deleterious insects, thereby protecting the main crop from pest infestation. For example, nasturtium can be used as a trap crop for cabbage caterpillars.

Some of the suitable flower crops having pest controlling properties are described underneath.

1. Borage (*Borago officinalis*, Boraginaceae):

In Britain, borage is most widely grown and utilized in several culinary preparations. It is an annual plant producing blue coloured star shaped flowers and does wonder when served in tinctures, herbal teas and leafy green delicacies. Apart from that, borage can efficiently prevent the occurrence of hornworm (*Manduca quinquemaculata*) in tobacco and cabbage worm (*Pieris rapae*) in cabbage. Also it is reported to augment the disease and pest resistance mechanism in plants.

2. Chrysanthemums (*Dendranthema grandiflora*, Asteraceae):

The big flower heads of chrysanthemum comes in wide array of colour shades viz. white, pink, yellow etc. and can be made useful in terms of controlling pests in garden. Some of its cultivars can be brewed to teas which can be served nematicide for killing root nematodes (*Meloidogyne* spp.) in solanaceous vegetable crops (Morton, 2022) and also useful in repelling Japanese beetles (*Popillia japonica*) in corns, soybeans etc. From the flowers of *Chrysanthemum cinerarifolium*, pyrethrum is extracted, which is an excellent pesticide against various insects and safer for human and animal consumption (Smith, 2020). Despites, the flowers attract many butterflies owing to their fragrance, which not only enhance the aesthetic view of garden but also aid in pollination.

3. Dahlias (*Dahlia variebilis*, Asteraceae):

Dahlias are a great choice for gardeners and flower lovers because of their varied shapes and colour shades. They are also known well for their insects as well as nematodes repelling properties, enabling them to be both beautiful as well as useful at the same time.

4. Four O'Clocks (*Mirabilis jalapa*, Nyctaginaceae):

The flowers are known to possess the power for attracting and killing Japanese beetles (*Popillia japonica*) effectively, making them a perfect trap crop to be place planted in the close vicinity of vegetable and flower garden. However, four o' clock flowers can be poisonous to human and pets, thus care should be taken to select a safer site for growing these plants.

5. Lavender (*Lavandula angustifolia*, Lamiaceae):

Apart from being beautiful, the sweet fragrance of lavender attracts many pretty insects as well as pollinating agents, thus assist in maintain the ecological sustainability. On the contrary, they can also keep away some harmful pests like flea beetles (*Phyllotreta cruciferae*), diamond black moths (*Plutella xylostella*) and whiteflies (*Bemicia tabaci*) from damaging crucifers (Smith, 2022).

6. Marigolds (*Tagetes* sp., Asteraceae):

The pest repelling properties of marigold has been widely acknowledged by many. French marigolds (*Tagetes patula*) can preferably keep whiteflies (*Bemicia sp.*) and harmful nematodes such as root knot nematodes in particular (*Meliodogyne incognita*) in check (Holdsworth, 2022). On the other hand, African marigold (*Tagetes erecta*) can be best used as an irritant to many disastrous pests. The scented cultivars of marigold are used for formulation of pest repellents. Despite of driving away many destructive bugs, marigolds are also reported to attract some undesired spider mites (*Tetranychus urticae*) and snails (*Cornu aspersum*).

7. Nasturtiums (*Tropaeolum majus*, Tropaeolaceae):

The edible nasturtium plants should be planted near the vicinity of tomato crop for fighting off whiteflies (*Bemicia tabaci*), cucumber beetles (*Diabrotica undecimpunctata*), aphids (*Diuraphis noxia*), cabbage caterpillar (*Pieris rapae*) and squash bugs (*Anasa tristis*). The yellow blooming cultivars can make excellent trap crop for aphids.

8. Petunias (*Petunia hybrida*, Solanaceae):

This plant can efficiently deter leafhoppers (*Nephottetix nigropictus*), tomato hornworms (*Manduca quinquemaculata*), asparagus beetles (*Crioceris asparagi*), aphids (*Aphis gossypii*) and many of the notorious pests.

9. Sunflowers (*Helianthus annuus*, Asteraceae):

Being a hardy plant, it comes well in garden and its large flower head attracts a number of beneficial insects such as pollinators like bees, wasps, butterflies etc. Besides, sunflowers can also efficiently drive away aphids (*Aphis gossypii*) from other plants.

10. Zinnia (*Zinnia elegans*, Asteraceae):

These beautiful flower plants not only do establish really quick but also stay long in the garden, thereby ensure continuous crop protection from invading pests for a long period of time. Zinnia attracts pollinating agents as well as ladybugs (*Coccinella septempunctata*), which are predominant natural enemies of aphids (*Aphis gossypii*) and also to some extent can track down some sucking pests like mites (*Tetranychus urticae*), scales (*Pinnaspis aspidistrae*), leaf hoppers (*Circulifer tenellus*), mealy bugs (*Planococcus citri*) etc.

Benefits of using flower plants as natural pest controller:

Natural pest control method may take a lot more initial effort, but yields a long term persisting effect to be harnessed in long run. Followings are some of the benefits offered:

a. The time required for pest management can be efficiently reduced through the adoption of natural pest control method.

b. By cutting down the insecticides usage, the carbon footprint can be reduced through minimizing the chemical toxin exposure to plants, pets, water, environment, soil as well as to humans.

c. A healthier garden in long run can be achieved, as biological pest control ensures negligible residual toxicity by bringing down the pesticide application.

d. As compared to chemical methods, the risk of resistance development in pests towards natural methods is comparatively slow.

e. The biological pest control method also makes sure the protection of beneficial pests such as pollinators, as it is target specific.

CONCLUSION

In a garden, pest control is quite essential for maximizing growth and production. Companion planting with flowers can be a healthy way of deterring the pests as pesticide usage can be minimized. Unlike toxic chemical pesticides, the natural control ensures safety of the beneficial insects and natural enemies. The above described flowers can be established quickly in garden to harness their benefits early. These flowers can either be grown in banks around the garden or can be planted in the near vicinity of main crop to ward off harmful insects & bugs.

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