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Intercropping in Floriculture for Better Quality and Revenue

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Introduction:

Intercropping is the cultivation of two or more crop at the same time in the same field. The most common goal of intercropping is to produce greater yield and better quality on a given piece of land by making use of resources that would otherwise not the utilized by a single crop. Intercropping of horticulture and floriculture crops in one field enhanced profit for floriculturists and also ensures better returns. Flower crops are important in our daily life as well as national economy. Therefore, intercropping of commercial flower crops has been growing in the past recent years. India has traditionally been a profound place for floriculture and gardening. Although flower cultivation has been practiced since time immemorial, floriculture has blossomed into a viable business only in the recent years. Floriculture activity has been envisioned as a profitable trade area with potential to activate self-employment among the farmers with low and middle income.

Objectives of Intercropping:

1. Intercropping was originally practiced as an insurance against crop failure under rainfall condition.
2. Intercropping utilizes the resources sufficiently and their productivity is increased.
3. Judicious utilization of resources such as labour and inputs.
4. Increase in productivity per unit land area.

Advantages of Intercropping:

1. Intercropping gives additional yield income/unit area than sole crops.
2. Intercrops maintain the soil fertility as the nutrient uptake is made from both layers of soil.
3. Reduction in runoff and control weeds.

Disadvantages of Intercropping:

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1. Management of intercrop having different cultural practices seems to be difficult task.
2. Harvesting is difficult.

Experimental Results:

1. A field experiment of marigold in gladiolus was carried out in the year 2001-2002 at the botanic garden, National research institute, Lucknow. It may be inferred from the experiment that gladiolus quality was significantly superior to the conventional planting system in the production of cormels and spikes(Singh, S and Datta, S.K. 2006).
2. Intercropping of annual flowers in jasmine was carried out at floriculture research farm, college of horticulture and forestry, Navsari agricultural university during the year 2014-15 to study the suitable intercrops in jasmine. The intercrops grown were African marigold, French marigold and gaillardia. It was found that Jasmine + French marigold performed the best and gave better quality and productivity of jasmine (Dodiya, Trupti P, 2016).
3. ICAR-AICRP (2015-16) evaluated different floricultural crops under coconut gardens in different parts of the country and floricultural crops in combinations with coconut for better quality and returns were identified. Those combinations are coconut + gerbera, coconut +tuberose, coconut +gladiolus, coconut + lily, coconut +heliconia, etc.
4. Nihad et al. (2016) evaluated and identified a speciality flower “Heliconia” as remunerative intercrop for coconut gardens.
5. Nihad et al. (2017) reported higher returns from marigold-gomphrena sequential intercropping under coconut gardens.
6. Desai et al. (2018) reported that intercropping of chrysanthemum, China aster under coconut plantation gave higher returns and positive influence of these crops on the plant health and productivity.

Doubling Farmers Income or Revenue Generation:

Doubling farmers income has emerged as the focal point for all the agricultural policy decision of the government due to increase in number of farmers suicide and low and high fluctuating farmers income. Doubling farmers income can be achieved by employing

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production technologies such as intercropping whereby profit is generated by planting an intercrop in the main field.

Doubling farmer's income in floriculture by means of intercropping:

1. **Heliconia as intercrop in coconut garden**:

   Heliconia are tropical ornamentals mostly indigenous to the neotrpics. The genus includes about 100 species along with a large number of hybrids and cultivars. Recently heliconia has gained much importance as one of the major commercial cut flowers in the tropic. Among the tropical flowers, heliconia is outstanding for its diversity in colour, form, size and particularly its vase life. There is a great potential for growing shade loving heliconia as intercrop in coconut gardens. About 50 percent of Indian productions of cut flower heliconia come from the coconut farms.

List of commercial varieties of heliconia in India

Variety	**Scientific name**	**Market value (Rs/inflorescences)**
Iris	*Heliconia stricta*	20-30
She	*H. orthotricha*	20-25
Sunrise	*H. stricta*	25-30
Jacquinii	*H. caribaea X H. bihai*	45-50
Caribbean	*H. caribbae*	60-70
Kawauchi	*H. bihai X H.caribaea*	40-50

Heliconia are emerging as an important new cut flower in India which can be grown as intercrops in plantation crops without any hi-tech facility. At present, marketing is concentrated in domestic markets of major cities in India which itself is fetching high profit.

2. **Marigold-gomphrena sequential intercropping**:

   Marigold and gomphrena are two potential commercial flower crops that are gaining global popularity as speciality loose flower. These can be used both as fresh and dry flowers for making various flower decorations. Flowers of marigold and gomphrena retain its freshness and colour for longer period making it preferred items among floriculturists. Introduction of these crops in thee interspaces of coconut not only enhances the aesthetic but also gives additional income in a short period of time.

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Season of planting:

Marigold flower fetches higher price during season of wedding and religious festival(Dec-April), whereas Gomphrena is preferred only during Onam season (Aug-Sept) for floral rangolies(drawings). Considering these, marigold can be cultivated during Oct-April by supplying adequate quantity of organic and inorganic nutrients. Gomphrena can be grown as a catch crop during May-Sept. utilizing the crop residues. By adopting this sequential cropping, we can ensure continuous production of flower crops during the months of peak demand.

Profit from the intercrops:

Commodity	Quantity/ha	Unit price(Rs)	Benefit (Rs)
Tagetes(Kg)	2800	50	140000
Gomphrena (Kg)	1750	40	70000

Total additional income: Rs. 210000

3. Marigold as intercrop in gladiolus:

Gladiolus is an important cut flower crop. It is commercially propagated by corms. It is well established that corm is a major factor influencing quality and yield of spike. Possibilities to improve the economics of cultivation of gladiolus by intercropping with marigold were explored. To minimize the intercrop competition for growth resources and the optimum level of production, alteration in planting arrangement of main crop is required to be standardized, enabling to create more space to grow a component crop between the two pairs of the main crop without reducing the plant density and yield (Sarkar and Pramanik, 1992).Intercropping of marigold with gladiolus paired system gave an additional yield than the pure cropping of gladiolus paired system. The net income due to the intercropping was almost two folds higher than the pure cropping of conventional practice.

4. Intercropping of annual flowers in *Jasminum sambac*

Jasminum sambac is one of the most popular jasmine species that is commercially grown in india. The genus jasminum comprises of 300 species which are dispersed throughout the warmer parts of Europe, Asia, Africa and Pacific region (Bhattacharjee, 1980). The flowers of jasmine are largely used for worship, garland making, general decorations and for hair adorning by women. Though it is primarily grown for fresh flower productions it occupies special importance as it is a promising crop for use as a

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starting material in the perfume, cosmetic industries and as a value source for export trade. The fragrance of the jasmine cannot be imitated by any of the known synthetic chemicals (Bhattarcharjee,1980). In this situation there is urgent need to extent the cultivation and production of jasmine. *Jasminum sambac* does not produce flowers in all seasons and for blooming it takes around a year so intercropping is the best alternative for the year around remuneration to the farmers during the first year of planting, pruning time and even during the period of flowering. It offers an opportunity to take annual flower intercrops like African marigold, French marigold, gaillardia, china aster, chrysanthemum, gomphrena etc.

Conclusion:

Intercropping is one of the most effective methods cropping system whereby the quality of different flowers crops are enhanced and increases farm income. It also provides higher employment opportunities in the farm families. Intercropping provides congenial microclimate condition in the main field which results in increase production in the main crop. Intercrop systems has been indicated to use the resources differently and more efficiently. Intercropping approach has increased flower productions and productivity per unit land area and as such farmers all over India are benefitted. Therefore, it is highly profitable and uses the resources efficiently. Intercrops also maintain soil fertility; reduce soil erosion, space utilization and controls pests and weeds.