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## Value addition of loose flowers

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### Abstract

Value addition is the process in which for the same volume of a primary product, a high price is obtained by means of processing, packaging, upgrading the quality and various other methods. Value addition in floriculture is a process to improve the economic value and also employment. The value addition of in floriculture includes adopting proper post harvest technology and logistics. The value addition helps to reduce the post harvest loss and to provide better quality, empower farmers and other weaker sections. There are numbers of flowers having potential value addition venture.

**Keywords:** Value addition, marigold, rose and loose flower

### Introduction

Floriculture industry is presently considered as one of the most profit making sector in agro-enterprise. Flowers have various uses in human day today life due to its aesthetic value, varying colors, fragrance, texture, diverse form. But flowers being highly perishable, makes it challenging to promote in market following inadequate post-harvest management practices for the growers. Floriculture sector not only includes the loose flowers, cut flowers and ornamentals but also the value added products derived from the flowers and its parts fetching really good amount of money in market and several industries increasing economic value and providing employments. Value addition of flowers is the process of improving economic value and appeal of any floriculture products by deriving changes in genetics and through processing as well (Mebakerlin *et al*, 2015) <sup>[1]</sup> using innovative methods.

### Different types of value added products of flowers are listed as

1. Value addition in loose flowers are: floral arrangements, garland, rangoli, Ikebana, moribana, free style, bouquets, button-holes, flower baskets, corsages, floral wreaths, garlands, veni, floats, floral decorations, in marriage celebrations.
2. Value addition in cut flowers etc.
3. Value addition in dry flowers-Identification and selection of flowers and plant parts and collecting raw materials, preservation and storage; the techniques in dry flower making are-Drying, bleaching, dyeing, embedding, pressing; Accessories; Designing and arrangement of dry flower as flower baskets, bouquets, pot-pourri, wall hangings, button holes, greeting cards, wreaths; etc. 3. Concrete and essential oils from certain species and varieties. Loose flowers are flowers plucked from the plants without stalks just below the calyx. Flowers such as roses, jasmine, marigold, tuberose, hibiscus are commonly used loose flowers. This loose flowers are not only used in its fresh forms but also have very high economic value having various value addition product by applying different processing techniques. Some value, added products obtained from loose flowers are essential oils, flavours, fragrance, pharmaceutical and nutraceutical compounds, cosmetics, insecticidal and nematicidal compounds, pigments and natural dye, gulkand, rose water, jam, jelly etc.

**Rose:** Rose commonly called as gulab and belongs to family Rosaceae. The botanical name of rose is *Rosa* spp, and it is also known as the queen of flowers. It is the symbol of beauty, love and fragrance. Rose is grown commonly in India, Bulgaria, Iran, Turkey and many other countries. Apart from using rose as cut flowers, gardens and as potted plant, the petals of rose show high economic value because of its sweet scent and flavour (Najem *et al*, 2013) <sup>[16]</sup>.

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Roses as loose flowers have short shelf life which is not enough profit making for farmers. Globally, it is the most popular flower at trade level having different uses and most imported and exported flower (leghari *et al.*, 2016) <sup>[2]</sup>. Due to its distinct aromatic character it is widely used in various industries, such in pharmaceutical, perfume, cosmetics and food. Rose as value addition products are:

**Rose oil and concrete:** Rose oil extraction has been known and practiced in Persia since 17th century which slowly spread all around the world. Among the *Rosa* spp., *R. damascena* Mill. Contain highest oil percent which is varies from 0.032 to 0.049% (Valtcho *et al.*, 2011) while the oil content in *R. centifolia*. Hemm is from 0.32-0.05%, other species such as *R. gallica*. L, *R. moschata*. L, *R. rugosa* are also used widely for oil extraction (Najem *et al.*, 2013; Baydar and Baydar, 2005) <sup>[16, 6]</sup>. Rose is an important flower having various aspects and widely used all over the world. Rose can be used as cut flower as well as loose flower. Floriculture industries have high value for development and promotion of roses. To prepare 1kg of rose oil around 3000-4000kg petal is required (Agaoglu, 2000) <sup>[14]</sup>. The main compounds of essential oil in rose are:  $\beta$ -citronellol, trans-geraniol, n-heneicosane, n-nonadecane, nonadecene, and phenylethyl alcohol, linalool (Najem *et al.*, 2013; Teodora *et al.*, 2016) <sup>[16]</sup>. Rose essential oil have several medicinal properties and therefore is highly recommended during therapeutic session and in pharmaceutical industries.

**Pharmaceutical uses:** Rose extract is used for mouth wash, it reduces the pain, and size of ulcers. Roses being anti-infective and anti-inflammatory is also used to cure conjunctivitis, dry eyes and other eye problems. Rose oil is also known for its anti-cancer, anti-depressant, relaxant antioxidant, antibacterial and antimicrobial activities (Najem *et al.*, 2013; Ardogan *et al.*, 2002; Achuthan *et al.*, 2003; Basim & Basim, 2003; Ozkan *et al.*, 2004; Kheirabadi *et al.*, 2008; Rakhshandeh *et al.*, 2008; Mahboubi., 2016) <sup>[12, 11, 8, 9, 7, 10, 17]</sup>. Rose essential oil has great benefit to the patient suffering from Alzheimer and dementia as it helps in memory enhancement (Mahboubi., 2016; Awale *et al.*, 2011; Esfandiary *et al.*, 2014; Jazayeri *et al.*, 2014; Mohammadpour *et al.*, 2014) <sup>[17, 18, 19, 20, 21]</sup>. The red rose consist anthocyanin pigments which are used as an anti-bacterial agent.

**Perfume:** Rose perfume is produced by using atter of roses or rose oil, which is a combination of volatile essential oils obtained from steam distillation of the crushed petals of roses. A related product is rose water which is utilized for cooking, as cosmetics, medication and in religious occasions. 2.4 Rose water: it is an important product in which 100gkg of rose petals are place in a still and boiled water until 1000L of water has been distilled. Rose water is used in making sweets, religious ceremonies. It can also be sprayed directly on the face for natural moisturizers and helps in controlling extra oil on face, face cosmetics etc. Rose water is also used in ice-cream and other sweets. 2.5 Food and drinks: Rose hips are periodically made into jam, jam, jelly, and soup or on the other hand are brewed for tea, essentially for high content of vitamin C (more than citrus fruits), polyphenols, carotenoids and tannins (Mahboubi., 2016) <sup>[17]</sup>.

It is also pressed and filtered to prepare rose hip syrup. Rose is also used to prepare candies by boiling the hips with water and sugar. Dried rose petals are commonly sold in market as laxative and flavouring agents in markets. Fermented rose petals are used to prepare wine by adding yeast (Nowak *et al.*,

2014) <sup>[22]</sup>. 2.6 Pot pourri: It is a mixture of dried and naturally fragrant plant part used as natural scent in the room is by adding few drops of essential oil. Rose petals are very commonly used as potpourris (Raju, 2016). 2.7 Miscellaneous: Rose is commonly used in several occasions and have high aesthetic values such as an offering in temples, rangoli making, venis, garland etc. Rose is also used in dried floral arrangement. Roses are the common constituents of most expensive cosmetics and body care products. Rose hips are additionally used to create Rose hip seed oil, Rose hips seed oil which is utilized in skin care products and some cosmetics items.

Roses for dry flower are preferred at bud-stage. They are economical and can be used over and over (Mebakerlin *et al.*, 2015) <sup>[1]</sup>. There are many other value added products of roses, such as teas, Gul Rohan, Gul Khand, rose oil, concrete, essential oil from *Rosa centifolia* and *Rosa damascena*, pankhuri, for pharmaceutical purpose, etc. In poultry, dried rose dreg (DRD), a by-product used as an alternative litter material showed decrease in pathogen micro-organism without effecting on broiler performances (Aktan *et al.*, 2004; Mahboubi., 2016) <sup>[15, 17]</sup>.

**Tuberose:** Tuberose (*Agave amica*), formerly *Polianthes tuberosa*, native of Mexico is a very commonly used cut as well as loose flowers. It is commonly known as Rajanigandha or Nishigandha and belongs to the family asparagaceae. It is highly in demand due to its pleasing fragrance but lack colors other than white making it less wanted compared to other colourful flowers. Tuberose is of 2 types: double row floret type is commonly used as cut flowers, whereas the single row floret type is used as loose flowers and is more fragrant than double row floret tuberose. The main chemical components in tuberose are methyl benzoate, methyl salicylate benzyl benzoate and pentacosane (Rakthaworn *et al.*, 2009) <sup>[23]</sup> of which methyl benzoate was found to be the main reason for the pleasant fragrance in perfumery. Tuberose compared to other loose flower have longer shelf life, the flowers stay fresh and fragrant for longer period of time.

#### Some of the value addition of tuberose are

**Essential oil:** Tuberose are very commonly used as essential oil due to good amount of oil content in it. The essential oil is extracted from the tuberose petals through solvent extraction method. Tuberose contains eugenol, benzyl alcohol, farnesol, butyric acid, methyl benzoate, nerol, geraniol and methyl anthranilate. Approximately, 1,150 kg flowers yield 1 kg absolute and concrete recovery of range 0.08 to 0.11% (Mebakerlin *et al.* 2015) <sup>[1]</sup>.

**Floral ornaments:** Loose tuberose flowers are commonly used for decoration during wedding ceremonies and other occasions as well. It is also used for making garlands, venis, gajra, floral bangles, ear-rings, crown, wreath. Loose flowers of tuberose are also dried and used for several other decorative purpose. 3.3 Medicinal purpose: Tuberose absolute is said to be an aphrodisiacs and may help with impotence. Its fragrance is known to relax the mind and enhances the blood circulation. Tuberose absolute is useful in relieving stress, helps in promoting assertiveness, build confidence, self-esteem, soothing aggression, and calms when one is trying to combat drug addiction. Tuberose oil is also used to treat skin infection, nausea, vomiting and various other medicinal purpose.

Floret coloring with edible dyes: Tuberose florets are also dyed with different edible colors for the consumer

acceptability (Safeena *et al.*, 2016)<sup>[3]</sup>.

**Miscellaneous:** Tuberose in Indonesia are cooked and used for preparing vegetables, soup, sauces. The florets are also used for preparation of aromatic bathing products, perfumes, candle making, room fresheners, buttonholes, rangoli etc. The flower also has immense use since the Ayurvedic tradition. It helps in increasing of emotional stamina of a person. In other parts of the world, it is cultivated for its hypnotic aroma and has enormous potential in the ornamental flower market. Its extracts are used in flavoring industry, soft drinks, perfume industry etc.

**Jasmine:** The genus Jasmine belongs to the family Oleaceae. Jasmine is distributed in tropical and subtropical countries around the world. The jasmine word derived from 'yasmin' an Arabic word which means 'gift from god'. It is cultivated for various purpose. It is a shrub, climbing, trailing and erect flowering plants and are both over green and delicious species. Flowers are mostly white and yellow. The flower petals of jasmine are very delicate and would be destroyed by the distillation process used in creating essential oils. Apart from the processing method it is essentially the same as an essential oil. The major chemical compounds found in jasmine oil are: cyclohexene, 3-ethenyl, acetaldehyde, cyclopropane, N-Methylallylamine, Propanamid, Phthalic acid, bis ester, 10-Methylnonadecane, 1H-Tetrazol-5-amine, and 1,2-Benzenedicarboxylic acid diisooctyl ester, linalool, terpenes derivatives, ketones (Temraz *et al.*, 2009)<sup>[25]</sup>.

**Essential oil:** Essential oil is a concentrated hydrophobic liquid containing volatile aroma compounds from different parts of plants. Essential oils are also known as volatile oils used for aromatherapy, medicines, perfumes, soaps, cosmetics and confectionary etc. Almost 200 spp. of jasmine is cultivated around the world for its fragrance. Egypt is the highest producer of jasmine oil in the world (Ahmed *et al.*, 2016)<sup>[24]</sup>. These oils are extracted using solvent extraction method, distillation, maceration, enfleurage and expression (Rajamani, 2003<sup>[4]</sup>). The scented oil of jasmine is obtained by steam distillation from the flowers of *Jasminum occidentale* and *Jasminum grandiflorum* is non-toxic and non-irritant and shows rich in linalool, benzyl acetate, methyl anthranilate, eugenol, benzyl benzoate, indole, and other compounds. The jasmine oil is highly recommended in cosmetic and perfumery industry for making perfumes, incense, soaps, shampoos and creams.

**Medicines:** The jasmine flowers are effective against jaundice and other venereal diseases; the flower buds of jasmine are used to treat ulcers, vesicles, boils, skin diseases and eye disorder. The different parts of the jasmine plant also have various pharmaceutical values. The leaves can be used for treating breast cancer and mouth ulceration. The oils are antidepressant, antispasmodic, anti-fungal, anti-bacterial, antiseptic, sedative anti-daturine etc. (Ahmed *et al.*, 2016)<sup>[24]</sup>.

**Miscellaneous:** The flowers of *Jasminum sambac* are used for the preparation of tea in China and Japan. Jasmine scones and marshmallow *Althaea officinalis*) are prepared from extracts of jasmine flowers are popular among the French. The fragrant jasmine flowers are used in decorating the hair of women as floral crowns or venis. 5. Marigold: Marigold (*Tegetus sp.*) is an herbaceous annual or perennial and produces flowers having both disc and ray florets in varying shades of yellow

and orange from family Asteraceae which grown all over the India.

Marigold flowers is a rich source of terpenoids, flavonoids, carotenoids and thiophenes that have found varied uses in preparation of medicines and insecticides. The yellow color dye known as 'egandai' or 'gendia' is extracted from the flowers of *Tagetes erecta* and it produces bright colour with mordants are commonly used natural dyes. In industrial application, the essential oils are widely used in the preparation of soaps, detergents, disinfectants, mosquito repellents, flavourings of food, etc. the powder and extracts of *Tegetus minuta*, rich in carotenoid is used as food coloring agents (Shirazi *et al.*, 2014)<sup>[26]</sup>.

*Tegetus lucida* are used in salads and as an aromatic herb which is added to soups, sauces, chicken dishes, etc.; the leaves are also used in the preparation of herbal tea (Mebakerlin, 2015)<sup>[1]</sup>. The flowers are used for making floral jewellery. Marigold is also also used in dry flower arrangements, garlands, corsages etc (L.C.De, 2020). The chemical composition of *T.minuta* essential oil are dihydrotagetone (33.9%), E-ocimene (19.9%), Zocimene (5.3%), limonene (3.1%) and epoxyocimene (2.03%), tagetone (16.1%), cis- $\beta$ -ocimene (7.9%), (Shirazi *et al.*, 2014)<sup>[26]</sup>. Conclusion: Value addition is an important sector for proper utilisation of fresh ornamentals in either garden-fresh or processed form. But the challenges are adequate technology for value added products, proper knowledge and plans for standards to be followed, availability of species and varieties as per market preferences, and approach of various agencies at various levels in different functional areas i.e., research, finance, quality assurance & certification.

Value addition is a business strategy that helps in creating new market demands and indulging renewed demand from the consumers. Value addition sector can solve the two major issues Un-employment and poverty of the nation, by providing a steady source of income to the growers. Government initiative is very essential to benefit the producers and the country's economy on a whole. Encouraging the value addition and adoption of proper and adequate technological interventions of new products and innovative methods. Broadening the mindset of people towards use of the flowers for the other industries and not only ornamental purpose can also help people create a source of additional income.

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