



SNS COLLEGE OF PHARMACY AND HEALTH SCIENCES

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Topic: periwinkle

Botanical name : catharanthus roseus

Family : apocynaceae

Economic part : root and leaf



Pink flower
(*Catharanthus roseus*)

White flower
(*Vinca minor* f. *alba*)





flowers in multi colour

Chemical constitution :

- **Morden investigation have shown that periwinkle contains more than 100 alkaloids distributed through out the plant .**
- **Medicinal importance due to presence of alkloids like ajmalicine (raubasin), serpentine & reserpine in roots , which is well known for their hypotensive & antispasmodic properties.**
- **Vincristin and vinblastine alkaloids from leaves,which have importance in cancer therapy.**

Origin and distribution :

- The plant is native of **madagascar** and from there, it has spread to india , indonesia , indo-china, philiphines , south africa , israel , USA & other parts of the world.
- In india, it is being grown in tamilnadu, karnataka, andhrapradesh ,MP ,Gujrat ,Assam in an area of **about 3000 ha**.

- The **USA is the world's largest user** of this plant as raw material. A single firm which has the patent to manufacture vinblastine and vincristine sulphate has been consuming more than **1000 tn** of leaves annually.

Description of plant :

- It is a perennial herb which grows up to 90-120 cm tall.
- It is a diploid with the ch no. $2n = 16$

Types and varieties :

1. **Rose purple flower** : cultivation due to higher alkaloid content.
2. **White flower** : variety “nirmal and dhawal “ by CIMAP lucknow.

Soil :

- **The crop is hardy and grows well on a wide variety of soils , except those which are alkaline or water-logged.**
- **Deep sandy loam to loam** soils of medium fertility are preferred of its large scale cultivation because of better development of roots and also easy to collect at harvest time.

Climate :

- **The distribution of the plant shows that there is no specificity in its climatic requirements.**
- **It comes up well in tropical ad subtropical areas.**
- **It can be successfully grown up to an elevation of 1300 M above sea level.**

- A well distributed rainfall of **100 cm** or more is.
- However the growth in tropical areas is better than the growth in subtropical areas , where its growth is slow, due to low temp in winter.

Propagation :

- **Plant can either be propagated by seeds or vegetatively through cuttings.**
- **Since plants propagated by cuttings flower earlier than the plants by seeds , it is recommended that for drug production the plants should be grown from seeds and for seed production from cuttings.**

Propagation by seeds :

- **Fresh seeds collected a few months in advance are preferred for sowing as they lose viability on long storage.**
- **The seeds can either be directly sown in the field or a nursery can be raised and the seedlings are transplanted.**

Direct sowing :

- The seed rate of **2.5 kg/ ha** are broadcasted at the onset of monsoon in june – july , in lines spaced **30-45 cm** apart and lightly covered.
- Since the seeds are very small ,for ease in handling & distribution, they are mixed with sand about **10 times** their weight.

- **Germination takes place after about 7-8 days .After germination is complete the seedlings are thinned at a spacing of 30-40 cm with in the row.**
- **The flowering starts 40-45 days after sowing.**

Nursery preparation and transplanting –

- **The other advantage to this method in comparison to direct sowing is that healthy and vigorously growing seedlings can be selected and the inferior ones can be discarded.**
- **Raised nursery beds in **march – april** in rows spaced at **8-10 cm** apart and about **1.5 cm** deep.**

- **About 500 gm** of seeds will be enough to raise seedling to cover 1 ha area. After 2 months of germination , the seedlings are ready for transplanting in to the field.
- The seedlings are transplanted at a spacing of 45 and 30 cm in the field.
- A population of **74,000 plants per ha** may be accommodated.

Vegetative propagation :

- **Soft wood cuttings obtained from the lateral shoots have proved better than either hard or semi hard wood cuttings.**
- **Cuttings of about 10-15cm length with a minimum of 5 -6 nodes are ideal and result in about 90 % rooting.**

Manuring and fertilizers :

- **Apply FYM at 20 tn /ha and N,P & K at 20 :50: 75 kg/ha as basal dose.**
- **On 60 days after transplanting apply 50 kg nitrogen as top dressing.**

Irrigation :

- In place where rainfall is evenly distributed throughout the year , the plant do not require any irrigation.
- In rainfed , **4-5 irrigation** will help the plants to give optimum yield.

Weed control :

- 2 weeding are required , first weeding may be done after about **60 days** of sowing and the second at **120 days** of sowing.
- Mulching the field with cut grass or rice straw will also minimize the weed growth.

Pests and diseases :

- **Little leaf** due to infection by mycoplasma resulting in stunted growth. This can be effectively checked by uprooting and destroying the affected plants.
- **Die back / Twig blight /Top rot** is reported during monsoon. Control measure is spraying mancozeb at an interval of 10-15 days.

Harvest , processing and yield :

- **Leaves, stem and seeds** : for leaves, leaf stripping twice , first after 6 months and the second after 9 months of sowing can be taken.
- **Roots** : the crop is harvested 12 months of sowing. The plants are cut about 7.5 cm above the ground level and dried for the stem, leaves & seeds.
- **Seeds** : it has to be collected from matured pods 2 to 3 months before the harvest of the whole plant.

Yield :

- **Under irrigated conditions :** about 4 tn/ha of leaves , 1.5 tn/ha of stem, 1.5 tn/ha of roots on air dried may be obtained.
- Where as **under rainfed conditions :** the yield will be about 2 tn /ha of leaves & 0.75 tn/ha each of stem and roots on air dried basis.
- The total alkaloid content in the leaf varies from 0.15 to 1.34 % of which the average content of vinblastine is 0.002 % while that of vincristine is 0.005 % .