Versatile Medicinal Plant

Kalihari

(Gloriosa Superba)

Cultivation Guide

Introduction:

Kalihari is also known as Gloriosa superba is the only species in this genus in the autumn-crocus family (Colchicaceae). With various common names including gloriosa lily, glory lily, fire lily, flame lily, climbing lily, creeping lily, and cat's claw or tiger's claw, It is a perennial herb and can be grown as climber. Its underground tubers, leaves, seeds and roots are used for preparing various drugs. Drugs prepared from kalihari are used for the treatment of rheumatism, anthelmintic, antipatriotic and induce polyploidy. Various tonics and syrups are made from the Kalihari plant. The average height of plant is 3.5-6m. The leaves are 6-8inch long and are sessile. Flowers are green in color and fruits are 2 inches long. The seeds are numerous and are compressed. Africa, Asia, USA and Sri Lanka are major crop growing countries. Tamil Nadu and Karnataka are major Kalihari growing states in India..

Not a true lily (family Liliaceae), it grows naturally in a wide variety of habitats from forests to thickets to grasslands and even in sand dunes and other nutrient-poor soils. Like other members of the Colchicaceae, all parts of this plant are poisonous, containing high levels of the toxic alkaloid colchicine but especially in the tubers. It can be fatal to humans and animals if enough is ingested. In lower doses it has been used as a traditional medicine. This plant is the national flower of Zimbabwe but is considered a noxious weed in some place such as Australia, some Pacific islands, and some parts of the US.

A plant of the lowland tropics and subtropics, where it can be found at elevations up to 600 meters, the plant has a clear preference for seasonal, monsoon climates with a pronounced dry season. The plant is not resistant to frost. Succeeds in full sun to partial shade. Prefers a moist but well-drained, humus-rich soil. Prefers an acid to neutral soil. The plant has often escaped from cultivation and has been classified as 'Invasive' in some areas. Plants propagated from seeds take 3 – 4 years to bloom. Plants can flower and produce seeds all year round, though mainly during the rainy season.

Medicinal Properties and Uses: In Ayurveda and Yunani systems of medicine it is a reputed medicine. According to Ayurveda, tuber is pungent, bitter, acrid, heating, anthemirtic, laxative, alexiteric, abortifacient, and useful in ulcers, leprosy, piles, iflommations, abdominal pains, itching and thirst.

Seed contain high level of colchicines. Cornigerine, 3-demethyl-N-formyl-N-deacetyl-b-lumicolchicine, 3-demethyl-g-lumicolchicine, 3-demethyl colchicines have been isolated from plant. b-sitosterol, its glucoside, a long chain fatty acid, b and g-lumiccolchicines from fresh tubers and luteolin, colchicines, N-formyldeacetylcolchicines and glucosides of 3-demethylcolchicine have been isolated from flowers.

Propagation

1. **Vegetative propagation :** Vegetative propagation by 'V' shaped tubers is a common practice, and suitable for the establishment of large plantings. It can be grown by seeds and tubers but plants are best raised from tubers. Tubers are planted in the bed during rainy season, maintaining

60 x 45 cm. spacing. Plant requires support as it is climber. Approximately 16,000 tubers are required as planting material for one acre of land.

2. **Seed :** Germination through seeds is a tough job. It requires some treatment before sowing like- Germination rates as high as 67 % were reached for seeds incubated at 20 - 25°c for a period of 31 days. Higher temperatures have adverse effects.

Varieties:

1. **Gloriosa superba:** Found in tropical Africa and India. The average height of this variety is 1.5m tall. The leaves are ovate having 10-12cm leaf length. Flowers are linear, 5-7m in length and are yellowish red in color.
2. **Gloriosa rothschildiana:** Found in tropical Africa. It is a tall climbing shrub. The leaves are broad lanceolate having 12-18cm leaf length. Flowers are linear, 5-7m in length and are yellowish white at base and crimson from margin in color.

Planting Season:

In Indian conditions June-July (kharif season) is best time to sow, maintaining 60 x 45 cm. spacing between plant to plant and row to row.

Soil and Climate:

It grows well in Black Soil, Red Sandy Lome soil, having pH 5.5 to 7 with good drainage. Crop requires hot and humid climate. It can be grown in tropical and sub-tropical regions upto 2400m.

For Kalihari plantation, it requires well pulverize and leveled soil. To bring soil to fine tilth ploughing and harrowing should be done. Proper drainage systems are made to avoid stagnation of water. Transplantation of Kalihari is done on convenient sizes subplots if the germination is done by seeds

Manures and Fertilizers:

The medicinal plants have to be grown without chemical fertilizers and use of pesticides. Supplementing with organic manures and fertilizers like- Vermicompost- Which provide nutrition and earthworms to land, Neem Cake- It is organic insecticide, which is helpful to eradicate all soil borne insects, Gypsum- It acts as a conditioner to the soil which results in soil aeration and Trichoderma- This is fungicide which is very useful to destroy all soil borne harmful fungus. These all are beneficial in getting a good yield of the crop. To prevent diseases, bio-pesticides could be prepared (either single or mixture) from Neem (kernel, seeds & leaves), Chitrakmool, Dhatura, Cow's urine etc.

Sowing Technique:

Tubers are planted in the bed of size 1 feet width during rainy season, maintaining 60 x 45 cm. spacing. Plant requires support as it is climber. Approximately 15,000 tubers are

required as planting material for one acre of land. Taking mortality of 7% (1000 plants extra) plants, The total tubers required for 1 acre land is 16,000.

Irrigation:

Because it is a rain fed crop, it does not require too much irrigation but periodic irrigations are done for good crop growth. Different irrigations are done at different stages of plant. In early stage of seedling, irrigation is done at 4 days of interval and then irrigation is not done at the time of harvesting and then again irrigation is done 2 times during fruit ripening. Do not overwater plants as it causes disease like premature falling of fruits.

Weeding :

Do periodic weeding and hoeing to keep nursery and field weed free. At initial times it requires frequent weedings. Manual weeding is good for plant growth. Otherwise 2-3 weedings are required in all. Chemical weeding should not be done.

Harvesting:

Plant starts harvesting in about 170-180 days after planting. Harvesting of capsules is done when it turns from light green to dark green color. Harvesting of tubers is done after 5-6 years of transplanting. For seed extraction mature flowers are taken and for processing underground tuber are taken.

Post- Harvesting:

After harvesting, cleaning and washing of tubers is done. Then tubers, seeds and pericarp are air dried in shades for few days. Packing is done in air tight bags for less spoilage and to increase self-life. From kalihari part several products like tonics and medicines for various diseases are made after processing.

Documentation of Activities

The documentation of all the activities starting from cultivation to post-harvest processing should be in the continuation and maintained properly. Records should be kept for each activity of cultivation such as sowing, weeding, irrigation, harvesting, and of post-harvest processing after harvest to sorting, drying, grading, packing and storage, with details of time and type of activity that refers to a complete history and ensure traceability of the final product.

PER ACRE COST OF CULTIVATION

SR NO	PARTICULARS	WORK	EXPENSES				
			1st Year	2nd Year	3rd Year	4th Year	5th Year
1	Land Preparation	Ploughing, Leveling etc	10,000	--	--	--	--
2	Organic Fertilizers	Manures and Fertilizer	20,000	--	--	--	--
3	Tubers	16000 Tubers @ Rs.5 per tuber	80,000	--	--	--	--
4	Sowing	Sowing tubers in land	5,000	--	--	--	--
5	Weeding	Weeding and Hoeing	2000	2000	2000	2000	2000
6	Electricity Bill		1000	1000	1000	1000	1000
7	Seed Harvesting	Cutting and other works	2000	2000	2000	2000	2000
8	Tubers Digging	Harvesting Tubers from land	--	--	--	--	**2000**
9	Post Harvest	Washing drying and packing	--	--	--	--	**10000**
Expenses (Per year)			**1,20,000/-**	**5,000/-**	**5,000/-**	**5,000/-**	**17,000/-**
Total Expenses (5 Years)			**1,52,000/-**				

INCOME PER ACRE

Type of production	Year					Total Yield (5 Years)	Buy-back Rate	Total Output
	1sr Year	2nd Year	3rd Year	4th Year	5th Year			
Seeds	100 Kg	100 Kg	100 Kg	100 Kg	100 Kg	500 Kg	Rs. 300	Rs.1,50,000
Seeds Cover	50 Kg	50 Kg	50 Kg	50 Kg	50 Kg	250 Kg	Rs. 100	Rs.12,500/-
Dry Tubers	--	--	--	--	1000 Kg	1000 Kg	Rs. 500	Rs.5,00,000/-
Total Output (5 Years)								Rs.**6,62,500/-**
Total Expenses (5 Years)								Rs.**1,52,000/-**
Net Income								Rs.**5,10,500/-**
Net Income (Each Year)								Rs.**1,02,100/-**

Contact for More Information

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