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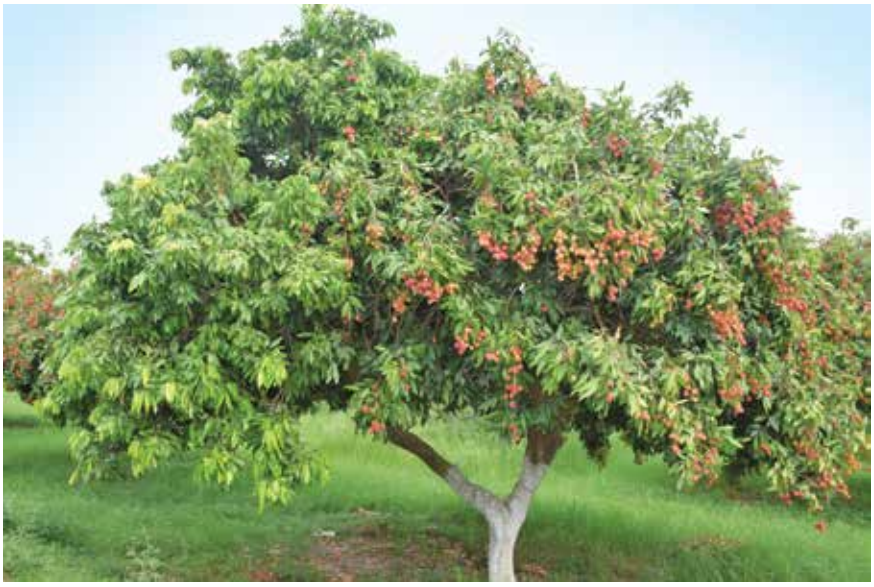
Girdling in litchi: A simple technique to boost yield and quality

Litchi, with its sweet, aromatic fruits and rich nutritional value, is a prized crop across tropical and subtropical regions. However, for many litchi growers, low flowering and fruiting, especially in alternate-bearing cultivars, remains a frustrating challenge. A simple yet effective solution to this problem is the girdling of primary branches. This ancient horticultural technique is now making a strong comeback among modern litchi farmers. When applied correctly and at the right time, girdling helps overcome the natural irregularities of litchi flowering, leading to more consistent and profitable production. Research has shown that girdling 50% of the primary branches with a 4 mm width cut during the first week of September, or after the appearance of the second vegetative flush (about 5–6 months before expected flowering), induces regular flowering and fruiting. This practice not only improves yield but also enhances fruit quality, making it a valuable tool for sustainable litchi cultivation.

LITCHI (*Litchi chinensis*), often called the "queen of fruits," is a delicious and aromatic fruit that has been cherished for centuries. With its appealing bright colour, juicy translucent pulp, and sweet, floral flavour, litchi is not only a delight for the taste buds but also a feast for the eyes. Native to southern China, this exotic fruit has found a home in many parts of the world, including India, Thailand, and Vietnam, where it thrives in warm, humid climates.

In India, litchi is cultivated on nearly 98 thousand ha with an annual production of 5.78 lakh metric tonnes (MoAFW, 2025). The country ranks second in global litchi production after China. Traditionally, it is grown in the plains adjoining the Himalayan foothills, particularly in Bihar, West Bengal, Jharkhand, Chhattisgarh, Uttarakhand, Uttar Pradesh, Tripura, Assam, Punjab, and Haryana. In recent years, its cultivation has also expanded into non-traditional areas, driven by higher economic returns and off-season production. However, despite this expansion, litchi has not yet become a major fruit crop in these regions due to the persistent problem of low and irregular bearing.

Litchi is considered a climate-sensitive crop. Under normal conditions, its trees produce two to three vegetative flushes each year. From June to November, litchi leaves generate large amounts of carbohydrates that accumulate in branches and trunks, with the highest starch concentration found in smaller branches. This stored energy plays a vital role in floral initiation and flowering in early spring.



Profuse bearing in girdled branch of litchi cv. China at ICAR-NRC on Litchi

Yet, litchi trees are notoriously shy bearers. Cultivars such as 'China' and 'Purbi' are especially prone to alternate bearing. Girdling of litchi branches has been found to enhance carbohydrate accumulation above the girdled region while reducing the

Circular girdled in 50% of the primary branch in litchi cv. China

uptake of water and minerals. This makes girdling a valuable technique to suppress new shoot growth and promote flowering. Typically, girdling is carried out in the first week of September (about six months before flowering) or after the emergence of the second vegetative flush and before flower bud differentiation. The wounds usually heal within six months, making it a safe and effective practice for improving flowering and yield in litchi.

Girdling in litchi

- **Identify suitable plants:** After harvest, mark the trees that bore profusely in the current season (*on-year*), as these are likely to go into an *off-year* the following season.
- **Mark the trees in July:** Select such trees in July for girdling operations.
- **Choose branches carefully:** Select healthy, mature branches. Perform girdling on 50% of the primary branches. For example, if the tree has two primary branches, girdle one; if it has four, girdle two.
- **Timing:** The ideal period is the first week of September, after the second vegetative flush.
- **Tools:** Use a sharp pruning knife or girdling knife for precision.
- **Method:** Remove a narrow strip of bark about 4 mm wide in a circular ring around the selected primary branch. The cut must pass through the phloem layer (outer bark) but should not injure the wood (xylem).
- **Post-treatment:** Clean the girdled area and spray copper oxychloride @ 0.3% immediately to prevent infection.
- **Precautions:** Avoid girdling trees that are stressed, weak, or diseased, as this can further reduce their health and productivity.

Benefits of girdling in litchi

- Increases flowering by enhancing the number of flower panicles (flower bunches).
- Improves fruit set and fruit size, leading to better market quality.
- Encourages early and uniform flowering, ensuring timely harvests.
- Reduces dependence on chemical flower-inducing agents, promoting a more eco-friendly approach.
- Provides regular and assured income to farmers by minimizing alternate bearing.
- Enhances yield, production, and overall fruit quality, making litchi cultivation more profitable.
- Strengthens the socio-economic condition of farmers through sustainable and consistent returns.

B:C ratio of the technology in different states

State	Variety	B:C ratio
Bihar	Shahi, China and Purbi	2.46
Jharkhand	China	2.91
Uttarakhand	Late Seedless	3.40
West Bengal	Bombai	1.56
Punjab	Calcuttia	1.62
Himachal Pradesh	Dehradun	2.60
Chhattisgarh	Shahi	-
Nagaland	Shahi	3.60
Karnataka	Shahi	2.03

Scientific backing

Studies conducted under the ICAR–AICRP on Fruits across different states have demonstrated that circular girdling of 4 mm width on 50% of the primary branches significantly enhances litchi productivity. The practice was found to increase the number of flowering panicles,

Flowering in non-girdled vs. girdled branches

improve fruit yield and size, and enhance fruit quality traits such as total soluble solids (TSS) and the TSS/acid ratio. These findings provide strong scientific evidence supporting girdling as an effective technique for improving litchi production.

Precautions

Girdling is a powerful technique, but it must be applied with caution. Overuse or improper methods can weaken trees and increase their susceptibility to pests and diseases.

- Avoid girdling during heavy rains or extreme dry periods.
- Do not girdle young, stressed, or weak trees.
- Prevent over-girdling or making deep cuts, as these can cause permanent damage to the tree.

CONCLUSION

At a time when climate variability and market pressures are pushing growers to seek innovative solutions, girdling stands out as a low-cost, scientifically proven practice to enhance litchi yields. With proper care, timing, and technique, this simple intervention can transform shy or alternate-bearing trees into reliable producers–bringing not only sweeter fruits but also sweeter success to litchi farmers.

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