

# India's First Desktop Vegetable Grafting Robot

Achieve Healthier & High-Yield Seedlings with  
Precision Grafting



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✉ hello@grafito.in

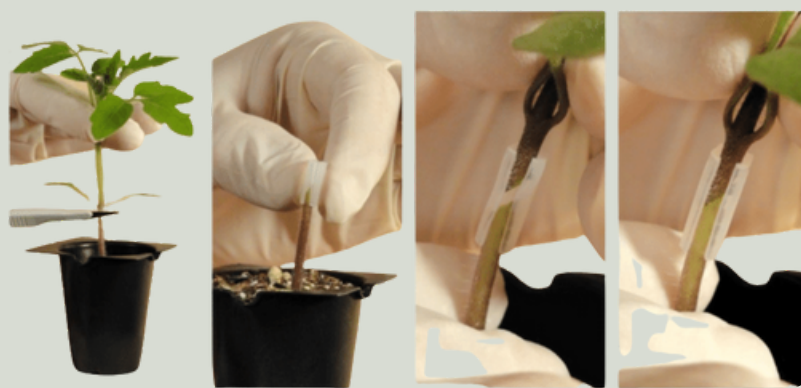
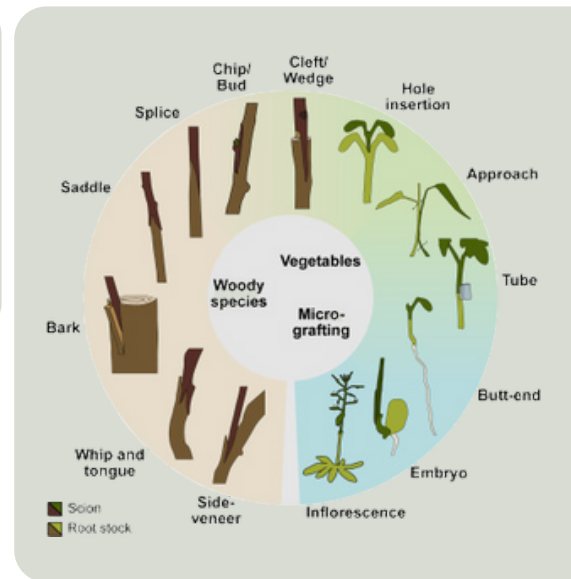
Get your grafting robot today !

# What is Grafting ?

**Grafting** is a horticultural technique where the tissues of **two different plants are joined together to grow as one**. The lower part, known as the **rootstock**, provides the root system, while the upper part, called the **scion**, develops into the stem, leaves, flowers, or fruits. For grafting to be successful, the cambium layers of both the rootstock and scion must be precisely aligned so they can fuse and form a strong union.

## Types of grafts used

**Splice grafting** is a simple and popular method where the rootstock and scion are cut at matching 30–45° slants so their cambium layers align and join easily. The stems **must be of similar thickness**, and the joint is secured **with a grafting clip** to ensure proper healing. This method is common in **tomato, brinjal, chilli, capsicum, okra, melons, cucumber, and other gourds**, as it produces strong plants that combine the rootstock's disease and stress resistance with the scion's yield and fruit quality. It is quick, nursery-friendly, and gives high success rates when performed at 25–30°C.



## Benefits of Grafting



Protection from Pest and Bacterial Wilt



30–40% More Yield



Flood & Salt Tolerance



Lower usage of pesticides

## Why automate grafting and what we do ?

**Grafting** offers significant business opportunities for nurseries and farmers, but challenges like labor shortages, inconsistent quality, difficulties in meeting high production demand, and the repetitive nature of the task have hindered its potential. To overcome these obstacles, **Grafito** has developed **fully** and **semi-automated grafting machines**.

# Key features of grafting machine

**01 Electrical actuation** for precise and smooth operation

**02** Optimized for **splice grafting**

**03** Ready for machine-vision integration

**04** Programmable operation parameter

**05 Adjustable cutting angle** and heights

**06 Single-operator** requirement

**08** Real-time monitoring and logging

**07** Compatible with most commercial grafting clips

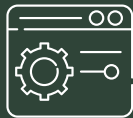
**09** Modular **tool change** for other grafting methods

**10 Consistent** accuracy

## Technical Specification



**Power Consumption less than 100W**



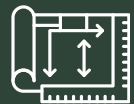
**Control Interface: Touchscreen + IoT**



**Grafting Speed: > 500 grafts per hour+**



**Power Supply: 220V AC**



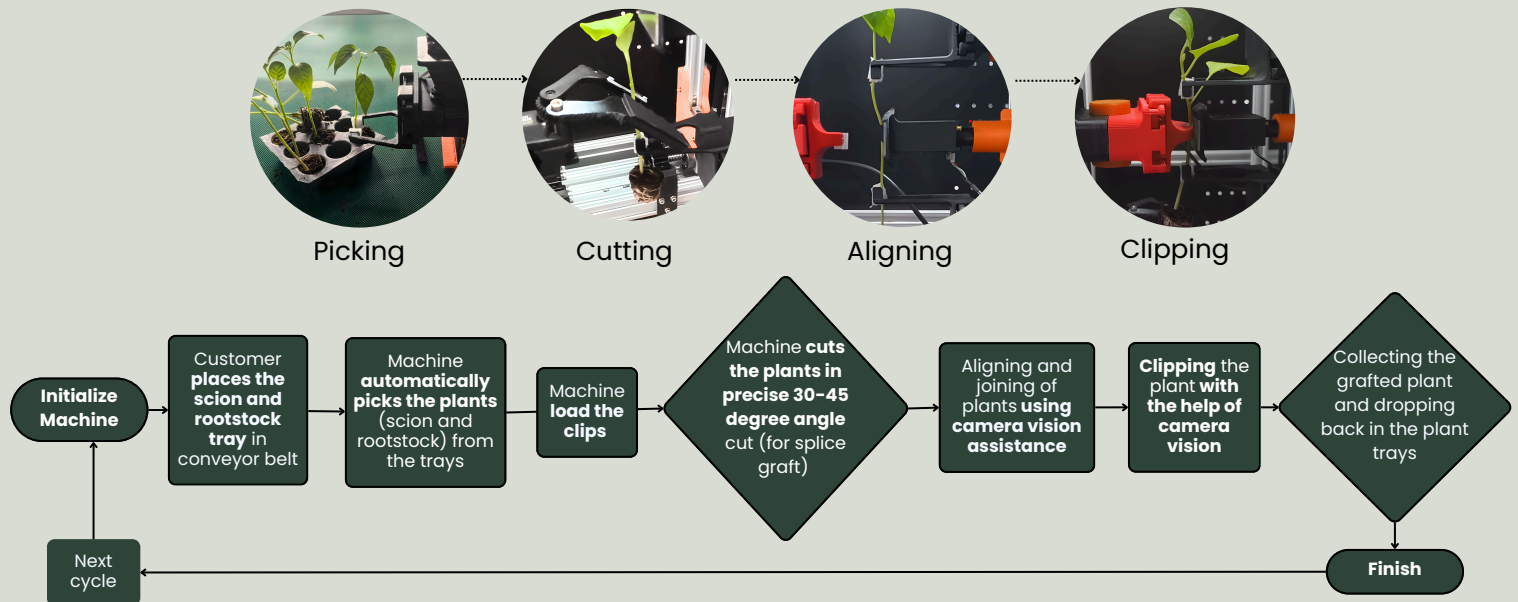
**Footprint: 80 cm × 80 cm × 80 cm**





# How Our Grafting Machine Works ?

Our grafting machine offers two flexible modes to suit different nursery needs. In the **semi-automated mode**, the operator simply feeds the rootstock, scion, and clips while the machine takes care of all the precision steps- cutting, aligning, and joining so every graft is uniform and reliable. For larger operations, the **fully automated mode** provides a complete robotic workflow, automatically picking seedlings from trays and clips without any manual effort, making it perfect for high-volume, continuous production.



## Pricing

Grafting as a Service

**Rs 25,000/month**  
+  
One time setup fee

Semi-Automated System

**Rs 5,00,000**



Manual loading



Auto cutting, alignment and clipping

Fully-Automated System

**Rs 6,50,000**



Automatic **seedling loading**



Automatic **clip loading**



# Cost comparison of grafted and non grafted plants (through Manual grafting) – Case study

Grafting eggplant onto *Solanum torvum* (Turkey Berry / Wild Brinjal) rootstock significantly improves plant vigor, resistance to soil-borne diseases, and overall yield.

Parameter	Non-Grafted Crop	Grafted Crop ( <i>S. torvum</i> )
Land Preparation	₹15,000	₹15,000
Nursery Cost	₹6,970 (5×2 ft)	₹29,040 (5×3 ft, grafted)
Labour Cost	90,000	1,20,000
Other Costs	₹1,13,000	₹1,43,000
Total Expense	₹2,24,970	₹3,07,040
Expected Yield	40 MT @ ₹10/kg = ₹4,00,000	80 MT @ ₹10/kg = ₹8,00,000
Total Income	₹4,00,000	₹8,00,000
Total Savings	₹1,75,030	₹3,92,960

## Benefit cost ratio– 1:2

**For every ₹1 invested they generated ₹2 in return.** Overall, grafted eggplant delivered 20–25% higher net yield and achieved a Return of Investment of 2.0–2.2 times more, demonstrating that grafting is commercially viable, scalable, and strongly beneficial for long-term farm profitability.

## Economics of grafting

ICRISAT launched a grafted vegetable program in Rayalaseema (AP) to tackle soil-borne diseases, salinity, and heat-related yield losses. The goal was to promote grafted seedlings across 400 hectares in three years. With support from the Department of Horticulture and Heirloom Plants Pvt. Ltd., farmers from multiple districts received grafted seedlings and training through village-based “learning sites” near the Center of excellence (CoE). Farmers soon observed clear benefits, including lower pest and disease incidence and yield increases of 20–150% compared to normal seedlings.

Crop	Non-Grafted Seedlings Produced	Area Covered (acres)
Tomato	9,18,734	122.5
Brinjal	2,48,500	33.13
Bitter gourd	46,774	12.64
Bottle gourd	3,057	0.83
Cabbage	6,319	0.53
Capsicum	34,822	1.39
Chilli	5,73,732	47.81
Drumstick	1,643	0.53
Ridge gourd	3,315	0.9
Snake gourd	550	–
Watermelon	21,160	–
Snake gourd	3,961	1.07

Crop	Grafted Seedlings	Area Covered (acres)
Tomato	1,56,859	20.91
Brinjal	1,09,821	14.64
Bitter gourd	52,656	14.23
Bottle gourd	32,424	8.76
Cabbage	–	–
Capsicum	–	–
Chilli	15,893	1.32
Drumstick	20,264	20.26
Ridge gourd	–	2.71
Snake gourd	–	2.14
Watermelon	–	0.15
Snake gourd	–	5.72

comparison of seedlings produced(both grafted and non grafted) in certain area ( source: ICRISAT Annual report on Grafted vegetables)

During 2019–20, grafted seedlings were distributed to farmers in 14 blocks across 9 districts. In the second year, the project produced 3.86 lakh grafted seedlings and 19 lakh non-grafted seedlings, benefiting hundreds of farmers across large areas.

## Cost breakdown of Grafted and Non grafted plants – Case Study from Kuppam Region (AP)



## Financial Analysis: Investment vs. Return

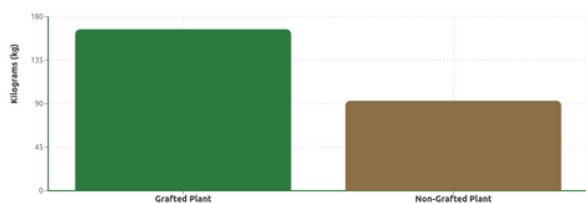


**BOTTOM LINE: For every ₹ 1 invested in grafting farmer earns approximately ₹ 6**

## Yield comparison of Grafted and Non grafted plants – Case study from a nursery in Punjab

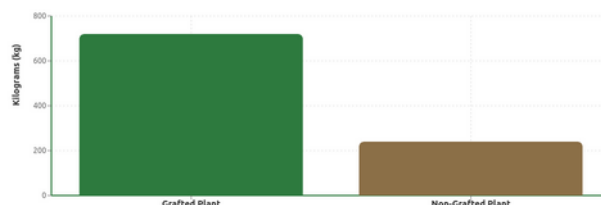
### First Harvest Period

29 November 2019 – 25 January 2020



### Second Harvest

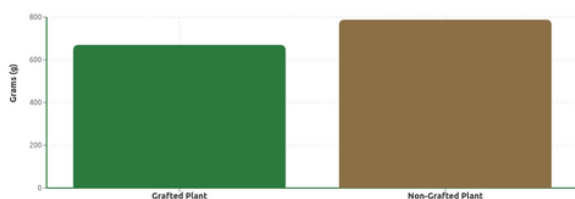
4 April 2020



total harvest

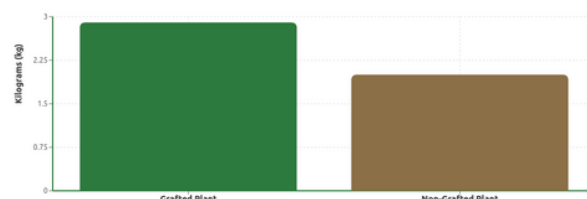
### First Harvest Period

29 November 2019 – 25 January 2020



### Second Harvest

4 April 2020



per plant average

**Grafted plants produced 40–60% higher yield than normal plants at the same harvest stage.**

# Economics of manual grafting vs robotic grafting

## Manual Grafting

### Labour Productivity

Grafts per worker per day: 500

Number of workers: 5

Total grafts per day:  $5 \times 500 = 2,500$  grafts/day

### Total Production Capacity

Daily production: 2,500 grafts

Yearly production:  $2,500 \times 20 \times 12 = 6,00,000$  grafted seedlings per year

### Labour cost

Salary per worker per day: ₹800

Salary for 5 workers per day:

$$5 \times 800 = ₹4,000/\text{day}$$

Monthly labour cost (20 working days):

$$4,000 \times 20 = ₹80,000/\text{month}$$

Annual labour cost:

$$80,000 \times 12 = ₹9,60,000/\text{year}$$

### Profit Per Seedling

- Production cost per seedling: ₹10
- Selling price per seedling: ₹12
- Profit per seedling:  $12 - 10 = ₹2$  profit per seedling
- Total seedlings per year: 6,00,000
- Total profit:  $6,00,000 \times ₹2 = ₹12,00,000$

### Net Profit (After All Costs)

Net Profit = Total Profit – Labour Cost – Additional Cost

Assuming additional cost = ₹1,00,000

### Calculation

Total profit = ₹12 L

Labour cost = ₹9.6 L

Additional cost = ₹1 L

**Net Profit = ₹12 L – ₹9.6 L – ₹1 L**

**Net Profit = ₹1.4 L per year**

## Robotic Grafting

### Investment Cost

One-time cost of robot: ₹5,00,000

### Machine Productivity

Grafts per robot per day: 4,000

Total grafts per month (20 working days):

$$4,000 \times 20 = 80,000 \text{ grafts/month}$$

Total grafts per year:  $4,000 \times 20 \times 12 =$

$$9,60,000 \text{ grafted seedlings/year}$$

### Labour Cost

Worker required: 1

Salary per worker per day: ₹800

Monthly labour cost:

$$800 \times 20 = ₹16,000/\text{month}$$

Annual labour cost:  $800 \times 20 \times 12 = ₹1,92,000$

(Rounded to ₹2,00,000 for calculation)

### Profit Per Seedling

- Profit per grafted seedling: ₹2
- Total seedlings per year: 9,60,000

**Total annual profit:  $9,60,000 \times ₹2 = ₹19,20,000$**

### Net Profit (After All Costs)

Net Profit = Total Profit – Robot Cost – Labour Cost – Additional Cost

Assuming additional cost = ₹1,00,000

### Calculation

Total profit = ₹19.2 L

Robot cost = ₹5 L

Labour cost = ₹2 L

Additional cost = ₹1 L

Net Profit = ₹19.2 L – ₹5 L – ₹2 L – ₹1 L

**Net Profit = ₹11.2 L per year**



# How Grafito's Grafting Machine Can Be Used as a Research Platform ?

Grafito Innovations' grafting machine is currently making a big impact in vegetable research and studies, offering a precise and flexible platform to handle different crops in future. The smart system can be used in field of various research helping to use as a tool for researchers, nurseries, and seed companies looking to improve crop breeding, quality, and automation .



Modular & Programmable Platform with AI Integration Capability



Flexible design with easily swappable parts for different crops and research needs.



Adjustable cutting angle, pressure, and height for consistent results.



Programmable settings for reliable and repeatable experiments.

## Crop Research Opportunities now and in near future



### Vegetables

Tomato, brinjal, chilli, cucumber, gourds, okra, focusing on rootstock compatibility, disease resistance, and stress tolerance.



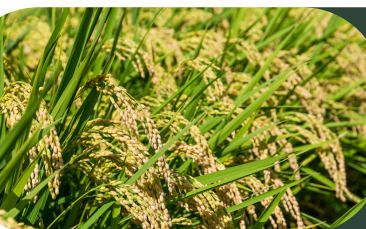
### Ornamentals & Flowers

Roses, bonsai, bougainvillea, adenium, and others, exploring unique flower colors and multi-scion tree development.



### Fruits

Citrus, pomegranate, litchie, dragon fruit, guava, etc with applications in orchard standardization and exotic fruit propagation.



### Future Trials with Monocots

Experimental grafting on Rice, other cereals, grasses and other crops using specially designed attachments.



### Hydroponics & Controlled Environment Agriculture

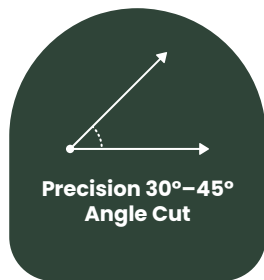
Developing disease-resistant and salt-tolerant rootstocks in vertical farming systems. Grafted plants develop stronger root systems, which perform better in hydroponics.

# Other products

## Hand grafting tool : Splice Grafting Made Easy

### Splice Grafting for vegetables made easy

Our Hand Grafting Tool is built to give clean, precise cuts with minimal effort, making grafting easier and more reliable for nurseries, growers, and horticulture professionals. Designed for accuracy and comfort, it helps users perform grafting smoothly while ensuring strong, healthy graft unions and consistently high success rates



Precision 30°–45°  
Angle Cut



Uses Normal Razor  
Blade



Ergonomic Design



## GrafTrack

Application designed to record and manage all grafting data in one place.



Stores pre-graft and post-graft details along with temperature, humidity, and other micro-climatic conditions.



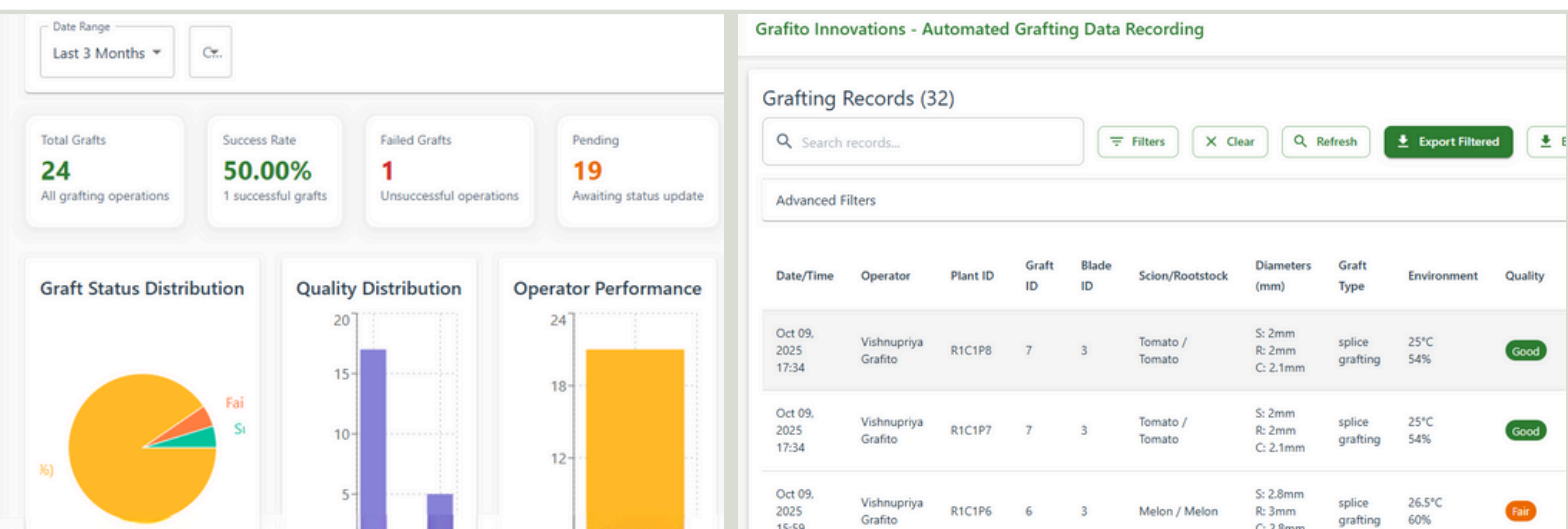
Fully customizable to suit any nursery or research workflow.



Simple interface makes it easy to store, track, and review data anytime.



This makes grafting documentation more organized, reliable, and efficient.



# Grafito's AI Grafting Chat Bot

Grafito's AI-powered chatbot is designed to guide growers with accurate, research-backed recommendations for every stage of plant grafting.



Helps users identify the ideal environmental conditions, choose the right rootstock–scion combinations for each state, and select varieties that offer resistance to specific diseases or stress factors.



Built using authentic, verified sources and extensive research reports and hence the chatbot ensures that users receive precise, reliable answers unlike other chatbots that often provide incorrect or incomplete information.

**Hi there!** 🙌

Start a chat. We're here to help you 24/7.

what are some good seed varieties for grafting

Could you please specify the Indian state or region you are interested in? Also, let me know which vegetable or crop you want to graft. This will help me provide you with seed varieties that are best suited for grafting in your particular climate and soil conditions.

I am looking for kerala

Thank you for specifying Kerala. Could you please let me know the particular vegetable crop or crops you are interested in grafting? Some common grafted vegetable crops include tomato, brinjal (eggplant), cucumber, watermelon, and chili. This will help me identify the best seed varieties and rootstock–scion combinations suited for Kerala's climate, soil, and prevalent pest/disease conditions.

I am looking for brinjal and tomato

For grafting tomato and brinjal in Kerala, here's a detailed recommendation based on regional considerations and available grafting data:

**Tomato Grafting Varieties and Rootstocks**

- Recommended Rootstock: Resistant tomato varieties such as Arka Rakshak and Arka Abhed, which provide Fusarium wilt and root-knot nematode resistance.
- Why it works: These resistant tomato rootstocks thrive well in Kerala's humid tropical climate and soils, which can be prone to bacterial wilt and nematodes. Utilizing resistant rootstock reduces disease incidence and improves plant vigor.
- Alternative Rootstock: Solanum torvum (wild eggplant) is highly effective against bacterial wilt and nematodes and is recommended especially in wilt-prone soils common in Kerala.

**Brinjal (Eggplant) Grafting Varieties and Rootstocks**

Type your question...

## Business & Innovation Opportunities



Enables on–farm research setups for nurseries and hydroponic farms to boost plant production and experimentation.



Opens doors for collaborations with seed companies, Nurseries and universities for joint breeding programs and multi–location trials and also we provides our machine on rental basis for experimentations and trials.



Encourages development of innovative grafting tools such as specialized clips, AI–based systems in different conditions, and other technologies to enhance grafting efficiency.





# FAQs



## **How to make machine compatible for other grafting methods and plants (like fruits, flowers and medicinal plants)?**



Reach out our team for customizations and further modifications



## **Does grafting affect nutritional quality?**



Grafting does not reduce nutritional quality; in many cases, it can improve it. A stronger rootstock allows better nutrient and water uptake, which supports healthier plant growth. This results in fruits and vegetables with improved quality, firmness, and consistency. Enhanced resistance to diseases and stress also helps maintain better overall nutritional value.



## **How grafted plants are different from hybrid seeds ?**



Grafted plants are made by joining two plants (rootstock + scion) so they grow as one, mainly for disease resistance, stress tolerance, and stronger growth. Hybrid seeds are produced by crossing two parent plants to create a new seed with combined traits, mainly for higher yield and uniformity.



## **How much power and cost of electricity does the machine consume per day?**



It will cost less than 10 Rupee for electricity per day for the units consumed by machine



## **How to know which variant of the rootstock should I grow in my region ?**



Choose the rootstock variety that matches your region's soil problems and climate, which is proven by local growers and nurseries, and is recommended by experts at Krishi Bhavan or your nearest KVK



## **What will be the return of Investment for the buyer using this machine?**



ROI will be 2-4 times more compared to manual grafting technique



## **What is the expected lifespan of the grafting machine?**



Since all spare parts are readily available and the machine can be serviced whenever needed, its lifespan can be extended significantly with proper maintenance.



## **Where is Graftio based in ?**



Graftio is an agritech product based deeptech startup based in Kochi, Kerala working on agricultural automation solutions



## **What are the procedure to buy automated grafting machine**

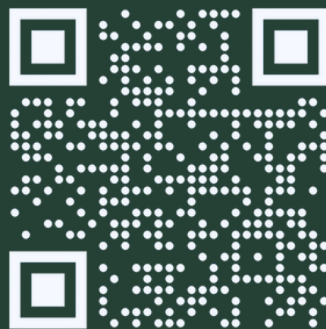


You can submit your interest via [www.grafito.in](http://www.grafito.in), WhatsApp 9074056134, or email [hello@grafito.in](mailto:hello@grafito.in); we'll schedule a demo or onsite visit and configure & install the machine as per your requirements.



# Transform your nursery operations with advanced automation—pre order your grafting machine today!

Keep in touch with our social media handles and visit our websites for further details, new interesting Blogs and Newsletters



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Have any query or want to know more about our products? Reach out us

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