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Economic viability and post- harvest challenges of organic kiwi cultivation in Ziro valley, Arunachal Pradesh

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Abstract

A field study was conducted on an organic kiwi orchard owned by Mr. Tage Obing (52 years) at Ziro Valley, Arunachal Pradesh. The one-acre terraced orchard was established in 2011 and produces 2-3 tonnes of kiwi annually. Four cultivars-Hayward, Allison, Monty and Bruno-are grown organically without the use of synthetic fertilizers or pesticides. The fruits are graded (A-D) based on their sizes. Grade A fruits are exported to states like Uttar Pradesh, Delhi, Maharashtra and Rajasthan, while lower grades are used for local processing into kiwi wine and dried fruits. The farmer earns about ₹2-3 lakh per year and received ₹3.8 lakh support under the Atma Nirbhar Bagwani Yojana. Major challenges include lack of cold storage, limited technical knowledge, small fruit size, and competition with imported kiwi. The study concludes that community cold storage, training, and local value-addition units can improve profitability and sustainability of organic kiwi farming in Ziro Valley.

Keywords: Kiwi, organic farming, post-harvest, value-addition, cold storage, Ziro valley

Introduction

Kiwi (*Actinidia deliciosa*) is one of the most promising high-value fruit crops suited to temperate regions of Arunachal Pradesh. Ziro Valley, with its mild climate, fertile loamy soil, and ample rainfall, provides ideal conditions for organic cultivation (Mani *et al.*, 2023) [4]. The fruit is rich in vitamin C, potassium and dietary fiber, making it highly demanded among health-conscious consumers (FCBA, 2021).

The Government of Arunachal Pradesh has been promoting kiwi cultivation through schemes such as the Atma Nirbhar Bagwani Yojana, offering financial support and input subsidies to small growers (GoAP, 2022). In 2021, NAFED launched India's first certified Organic Ziro Kiwi in New Delhi, highlighting the region's potential for export-quality production. This study documents the farming practices, economics and post-harvest challenges of one representative organic kiwi orchard to understand its viability and identify possible improvements.

Materials and Methods**Study site**

The study was conducted at Mr. Tage Obing's organic kiwi orchard located in Ziro Valley, Lower Subansiri District. The area lies in a cool, humid zone with annual rainfall exceeding 1500 mm. The farm covers 1 acre of terraced land with fertile loamy soil.

Data collection

Information was obtained through a direct field visit and structured interview during September 2025. Observations were made on agronomic practices, yield, marketing and constraints. The data presented are based on primary field observations supported by secondary literature.



Fig 1: Mr. Tage Obing at his Kiwi Orchard Farm, Ziro, Arunachal Pradesh.



Fig 2: Team members field visit and interaction with Mr. Tage Obing during data collection at his organic kiwi orchard, Ziro, Lower Subansiri, Arunachal Pradesh

Results and Discussion

Orchard establishment and crop details

The orchard was established in 2011. Plant spacing is maintained at 6 m between plants and 4 m between rows, supported by GI wire trellising with iron posts. The male-to-female ratio is 1:10, though horticultural experts recommend 1:8 for better pollination efficiency. Sowing occurs in January-February, flowering during April-May, fruiting in September- October, and harvesting from October to early November.

Four kiwi varieties are cultivated

1. Hayward - large, oblate to elliptic, long shelf life; most preferred for export.
2. Allison - medium-to-large, oblong to elliptic.
3. Monty - round, medium-sized.
4. Bruno - long, cylindrical, small-to-medium.

The orchard is completely organic. Cow dung mixed with soil is applied annually, and no chemical fertilizers or pesticides are used. Irrigation relies entirely on rainfall.

Production and yield

No fruiting occurs during the first two years. Cutting-propagated vines begin bearing in the 3rd yr, and grafted plants in the 2nd yr. The yield from the 2nd and 3rd year are

usually self-consumed as they do not meet the market standard. The first Marketable yields are obtained after the 4th to 5th year. Current production averages 2-3 tonnes per year, consistent with yields reported for small organic kiwi farms in hilly regions.

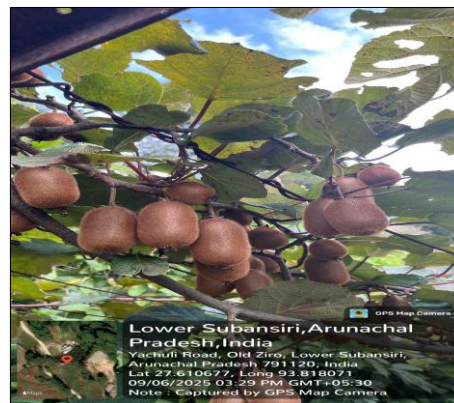


Fig 3: Close up view of mature kiwi fruits ready to harvest under Organic management

Pest and disease management

No major pest or diseases were found.

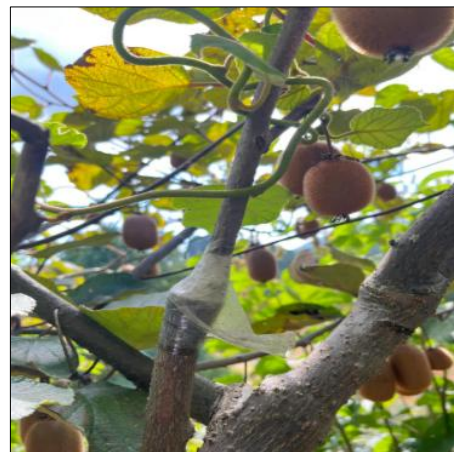


Fig 4: Grafted kiwi vine showing successful union between scion and rootstock under field conditions at Mr. Tage Obing's organic orchard, Ziro.

Labor and management

Routine operations such as weeding, thinning and pruning are performed manually. Laborers are hired at ₹ 500/day, supported by family labor. The vines are trained on GI wire trellises fixed to Iron posts. Hand weeding is the primary weed-management method.



Fig 5: Trellis structure supported by GI wires and Iron Posts for training of kiwi vines on terraced slopes.

Grading, marketing and value addition

Fruits are graded by size into Grades A to D (Table 1).

Table 1: Kiwi fruit grading and price structure at Ziro Valley

Grade	Quality Metric (Size/Appearance)	Indicative Price (₹/unit)	Primary Market Destination
A	Large Premium (Export standard)	₹150-₹170	National Export Hubs (UP, Maharashtra, Delhi, Rajasthan)
B	Standard market quality	₹100-₹120	Regional Markets
C&D	Small to medium in size	₹50- ₹80	Local Consumption & Value Addition

Grade A fruits are sold to states such as Uttar Pradesh, Delhi, Maharashtra and Rajasthan, while lower grades (C & D) are supplied for value-added processing such as kiwi wine and dried kiwi fruit. Marketing is channeled through a cooperative society that aggregates fruit from all local farmers for wholesale sales. The Uttar Pradesh market buys the largest share. Similar cooperative marketing structures have improved farmer returns elsewhere in the North- East (Indian Cooperative, 2021) [3].

Government support

Mr. Obing received ₹ 3.8 lakh financial assistance under the Atma Nirbhar Bagwani Yojana to strengthen orchard infrastructure, trellising and marketing. Such targeted support has significantly expanded kiwi acreage in the state.

Post-Harvest management

Kiwi being a climacteric fruit, is harvested before full ripening for long-distance transport and storage. The fruits are sorted, packed and dispatched within a week of harvest. However, the absence of cold-storage and pre-cooling facilities results in losses of 10-15%. Research emphasizes that proper cold-chain management can double the shelf life of kiwi and maintain quality (Postharvest Biology & Technology Review, 2024) [5].

Income and challenges

The average annual income from the orchard is around ₹ 2-3 lakh. Despite profitability, the farmer faces several challenges:

- Lack of cold storage for fruit preservation
- Limited modern technical knowledge
- Poor marketing network knowledge
- Difficulty competing with imported large-sized kiwis
- Smaller fruit size due to purely organic management

Recommendations

- Establish community cold-storage and pack-houses to reduce post-harvest losses.
- Provide training on organic nutrient management, pruning, grading, and packaging.
- Promote value-addition units for kiwi wine, jam and dried fruits to absorb lower grades.
- Strengthen cooperative marketing networks for bulk sales and inter-state linkages.
- Encourage research on organic nutrient blends and pollination ratios to improve fruit size and yield.

Conclusion

The case study of Mr. Tage Obing's orchard demonstrates that organic kiwi farming in Ziro Valley is economically viable and environmentally sustainable. Low input costs, strong cooperative marketing, and government assistance make the enterprise profitable. However, lack of cold-storage, small fruit size, and limited post-harvest knowledge remain

major constraints. Addressing these through training, infrastructure development, and value-addition support will enhance the profitability and resilience of organic kiwi cultivation in Arunachal Pradesh.

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