



Quality Analysis of Kiwifruit Cultivars in Mid Hill Condition of Lumle, Nepal

**POUDEL, Shyam Prasad ¹, SOMAI, Kajol ³, TIMILSINA,
Chandrakanta ¹, BASNET, Resham Bahadur ¹, UPADHYAY,
Kalika Prasad ², and GAUTAM, Janarjan ⁴**

¹Directorate of Agricultural Research, Lumle, Kaski, Nepal

²National Agricultural Technology Information Centre, Khumaltar, Lalitpur

³Agriculture and Forestry University, Rampur, Chitwan

⁴Coffee Research Program, Gulmi.

Corresponding Author's E-mail: shyampoudelpg@gmail.com

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ABSTRACT

This study conducted at the Directorate of Agricultural Research (DoAR), Lumle, Kaski (1650m asl) from 2022 to 2023, evaluated the quality attributes of four kiwifruit cultivars: 'Hayward Oblong', 'Hayward Oval', 'Allison', and 'Bruno-2'. Mature fruits, ripened for two weeks using local ethylene-releasing agents, were analyzed for physical characteristics (individual fruit weight, 5-fruit weight, length, diameter, diameter-to-length ratio) and chemical properties (Total Soluble Solids (TSS) and Titratable Acidity (TA)). Data were statistically analyzed using ANOVA and Duncan's Multiple Range Test. Results revealed significant genotypic variation: 'Bruno-2' consistently showed superior individual fruit weight (28.00g in 2022, 46.1g in 2023) and higher TSS (10.92°Brix in 2022, 15.96°Brix in 2023), while 'Hayward Oval' was rounder (diameter/length ratio 1.01 in 2022, 0.89 in 2023) with higher acidity (1.97% TA in 2022, 2.19% TA in 2023). All cultivars exhibited increased fruit weights in 2023, suggesting improved conditions.

Keywords: Fruit diameter, fruit weight, mid-hills, physical parameters, varieties

INTRODUCTION

Global and national significance of kiwifruit cultivation

Kiwifruit (*Actinidia spp.*) has achieved substantial global recognition, primarily attributed to its distinctive flavor profile, exceptional nutritional content and



various medicinal properties. It is notably rich in Vitamin C, surpassing the levels found in common fruits such as oranges, pears, and apples. This widespread appeal underscores its growing economic significance as a high-value horticultural crop worldwide.

In Nepal, kiwifruit cultivation represents an emerging and increasingly popular perennial fruit crop among farmers, particularly in recent years. The crop is increasingly acknowledged as a high-value cash crop, presenting a viable pathway to augment agricultural income for rural communities. The agro-climatic conditions prevalent in Nepal's mid-hills and high-hills are highly conducive to kiwifruit cultivation, with optimal growth observed at altitudes ranging from 1200 meters to 2400 meters above sea level. This inherent climatic compatibility positions kiwifruit as a promising alternative for fruit growers in the country's hilly regions, especially in areas situated above the traditional citrus and apple growing zones.

Commercial kiwifruit cultivation in Nepal formally began around 2009 AD, with initial promotional efforts concentrated in districts such as Kavre and Ilam. In Ilam, for instance, cultivation has been ongoing for approximately 15 years, spurred by individual farmer initiatives and collaborative community efforts. The adoption of kiwifruit by farmers in regions like Ilam was often a deliberate response to challenges encountered with traditional crops, such as diminished earnings from corn and difficulties in cardamom sales. This shift towards kiwifruit cultivation highlights a strategic diversification in agricultural practices. Farmers are increasingly recognizing kiwifruit not merely as a novel crop but as a critical component for enhancing economic returns and building agricultural resilience. The long productive lifespan of kiwifruit plants, extending 30 to 40 years, further reinforces its role in fostering long-term income stability for farming households. This move towards high-value crops like kiwifruit reflects a broader national agricultural strategy aimed at increasing farmer profitability and potentially reducing reliance on less lucrative traditional crops, thereby contributing to overall rural economic advancement.

Recent status of kiwifruit production and productivity in Nepal

Kiwifruit production in Nepal has exhibited a consistent upward trend in both cultivated area and total output over recent fiscal years. Data from the Ministry of Agriculture and Livestock Development (MoALD) indicates a significant expansion in the total area under kiwifruit cultivation, increasing from 283



hectares (ha) in Fiscal Year (FY) 2014/15 to 2599 ha in FY 2021/22. Concurrently, national production escalated substantially from 368.1 metric tons (mt) to 7698 mt during the same period. While showing overall growth, productivity has experienced fluctuations, ranging from a low of 3.65 mt/ha in FY 2019/20 to a high of 7.59 mt/ha in FY 2021/22.

The following table provides a detailed overview of the national kiwifruit production trends:

Table 1. Kiwifruit Area, Productive Area, Production, and Productivity in Nepal (FY 2014/15 - 2021/22)

Fiscal Year	Area (ha)	Productive Area (ha)	Production (mt)	Productivity (mt/ha)
2014/15	283	52.5	368.1	7
2015/16	298	58	378	6.6
2016/17	551	186	719	3.86
2017/18	949	322	2188	6.8
2018/19	1362	492	3372	6.86
2019/20	2116	1167	4254	3.65
2020/21	2450	859	6482	7.55

Source: MoALD (2014-2021)

This data provides a clear, chronological perspective on the expansion of kiwifruit cultivation across Nepal. The structured presentation allows for a rapid assessment of the growth in both cultivated area and total production. The inclusion of productive area and productivity metrics offers a deeper understanding of cultivation efficiency over time, highlighting periods of enhanced yield or potential challenges in resource utilization. This comprehensive trend data is fundamental to comprehending the overall trajectory and health of the Nepalese kiwifruit sector.

Regionally, Ilam district stands out as a significant contributor to national kiwifruit production, accounting for approximately 28% of Nepal's total output in 2021, with 1840 tons produced out of a national total of 6482 tons. Province 1, encompassing Ilam, dedicated 1266 ha to kiwifruit production in 2021. Dolakha district also holds a notable share, with 200 ha under kiwifruit cultivation, while Ilam district recorded the highest production volume at 990 mt in 2019.

From an economic perspective, the horticulture sector, which includes fruits, contributes significantly to Nepal's agricultural Gross Domestic Product (GDP),



accounting for 39%, with fruits specifically contributing 7.04% of the national GDP (MoALD 2022). Despite increasing domestic production, Nepal continues to import kiwifruit. However, the import value, approximately NPR 61 million in 2021, is estimated to be only about 8% of the value of domestically produced kiwifruit, which stood at NPR 779 million in 2021. This indicates a robust domestic market and considerable potential for further import substitution. The substantial increase in domestic kiwifruit production and the relatively low import value compared to domestic production value suggest that local demand is largely met by internal supply, and increasing production is likely both driven by and stimulates local consumption. This trend positions kiwifruit as a successful example of import substitution within Nepal's agricultural sector. Continued growth could further reduce reliance on foreign imports, conserve foreign exchange, and strengthen the domestic agricultural economy. This also implies that ongoing efforts in market access and value chain development are crucial for sustaining this growth.

Despite the growth in area and production across horticultural crops, the overall productivity of fruits in Nepal has remained comparatively low, averaging around 9-10 mt/ha in FY 2018/19. This figure is considerably lower than that of neighboring countries. This national context underscores the critical importance of enhancing productivity in specific emerging crops like kiwifruit to maximize their economic contribution.

Kiwifruit production and productivity in Gandaki province

Gandaki Province is one of the key regions where kiwifruit cultivation has been established and is subject to ongoing agricultural research. Historical data for FY 2017/18 indicates that Gandaki Province reported a total kiwifruit area of 42 ha, with 13 ha being productive. The province's production for that year reached 68 mt, achieving a productivity of 5.2 mt/ha (NCFD, 2019). At that time, Gandaki Province ranked fifth in terms of kiwifruit area and fourth in production among the provinces of Nepal.

More recent data for FY 2079/80 (2022/23) presents a notable shift in the reported statistics for Gandaki Province. The total area under kiwifruit cultivation was reported as 8 ha, with a productive area of 6 ha. Production for this period stood at 16 mt, and the yield was 2.73 mt/ha.



The following table summarizes the kiwifruit statistics for Gandaki Province across these selected fiscal years:

Table 2. Kiwifruit Area, Productive Area, Production, and Productivity in Gandaki Province (Selected Fiscal Years)

Fiscal Year	Total Area (Ha.)	Productive Area (Ha.)	Production (ton.)	Productivity (ton/Ha.)
2017/18	42	13	68	5.2
2022/23	8	6	16	2.73

Source: NCFD, 2019; MOALD, 2022/23

This table provides specific, localized data for Gandaki Province. By presenting data from two distinct fiscal years, it facilitates a direct comparison of trends within the province. A comparison of the 2017/18 data with the 2022/23 data for Gandaki Province reveals a significant reduction in reported kiwifruit cultivation area and production. This contrasts sharply with the overall national trend of increasing kiwifruit production. This apparent reduction necessitates further investigation to understand its underlying causes. It could indicate a genuine decline in kiwifruit farming within Gandaki Province due to specific local challenges, such as market access issues, disease outbreaks, shifts to other more profitable crops, or adverse climate impacts. Alternatively, it might reflect changes in data collection methodologies or reporting practices, potentially leading to an underestimation of cultivation in more recent years. It is also possible that the 2022/23 data represents only a subset or specific type of cultivation that is not directly comparable to the earlier figures. For a comprehensive understanding, this apparent decline represents a critical area for subsequent research to ascertain the precise causes and their implications for regional agricultural policy and development. Within Gandaki Province, the Directorate of Agricultural Research (DoAR) in Lumle, Kaski, situated at an altitude of 1650 meters above sea level, serves as a pivotal research site for kiwifruit varietal evaluation. Studies conducted at this facility, such as the one from 2022 to 2023, are instrumental in assessing the performance of various kiwifruit cultivars under the specific mid-hill conditions of the province, thereby directly contributing to the optimization of local production practices.

Challenges and opportunities in Nepalese Kiwifruit sector

Despite the increasing popularity and significant potential of kiwifruit cultivation, the sector in Nepal faces several notable challenges. A primary constraint is the scarcity of high-quality saplings, which often compels farmers to utilize



unauthorized planting material due to the absence of effective regulatory systems for fruit nurseries. Furthermore, a widespread issue is the limited adoption of modern agricultural technologies; many farmers continue to employ traditional farming techniques and lack adequate knowledge regarding proper training, pruning, and girdling methods essential for optimal kiwifruit production. Additional challenges include the prevalence of nematodes, which can cause significant damage to kiwifruit plants, and substantial post-harvest losses resulting from inadequate handling methods in sorting, grading, and packaging. Market access and a considerable disparity between farm-gate and retail prices also pose economic difficulties for farmers. The simultaneous presence of favorable climatic conditions and rising demand, alongside critical constraints like the lack of quality saplings and limited technology adoption, points to a disconnect between the inherent potential of the sector and its realized output. The issue of unauthorized saplings highlights a systemic failure in regulatory oversight and supply chain management, while the persistence of traditional farming methods indicates a pronounced need for more effective agricultural extension services and farmer education programs. This suggests that while Nepal possesses the natural conditions and market interest for a thriving kiwifruit industry, its full potential is being hampered by structural issues related to agricultural policy, the dissemination of research findings, and the development of essential infrastructure. Addressing these bottlenecks through targeted interventions, such as the establishment of certified nursery development programs, the provision of accessible and practical training and improvements in post-harvest facilities is crucial for fostering sustainable growth and maximizing the economic benefits for kiwifruit farmers.

Conversely, the opportunities for expanding kiwifruit cultivation in Nepal are substantial. The country's diverse climatic zones offer broad suitability for kiwifruit, particularly in the mid-hills. There is also a burgeoning demand for kiwifruit, both domestically and with significant potential for export, which presents a considerable market opportunity. The sector benefits from support provided by various governmental and non-governmental organizations, including the Prime Minister Agriculture Modernization Project (PMAMP), research centers like TFRDC, NGOs, cooperatives, and local municipalities. These entities offer crucial production inputs and technical services to farmers, thereby cultivating a supportive environment for sectoral growth.



Rationale for varietal evaluation and quality analysis

The diverse agro-ecological conditions across Nepal's mid-hills necessitate localized research to identify the most suitable kiwifruit cultivars for specific environments. Studies, such as those conducted at the Directorate of Agricultural Research (DoAR) in Lumle, Kaski, are vital for evaluating the quality attributes of different kiwifruit genotypes under local conditions. This research directly addresses the critical role of genotype-environment interaction in determining fruit quality and overall performance.

The evaluation of cultivars, including 'Hayward Oblong', 'Hayward Oval', 'Allison', and 'Bruno-2', provides valuable insights into their performance across key parameters such as fruit weight, dimensions, total soluble solids (TSS), and titratable acidity (TA). Findings from such studies, for instance, indicating that Bruno-2 consistently excels in fruit weight, length, and sweetness (TSS), while Hayward Oval demonstrates superior roundness and acidity (TA%), offer clear guidance for varietal selection based on specific market preferences. This differentiation allows growers to choose cultivars best suited for particular market segments, whether prioritizing size and sweetness or shape and tanginess.

The observed increase in fruit weight across all cultivars from 2022 to 2023 in the Lumle study highlights the potential for improved agronomic practices and favorable environmental conditions to enhance overall productivity. This observation is particularly relevant given the broader national challenge of low fruit productivity in Nepal. Such research is crucial for developing and disseminating best practices that can bridge this productivity gap. By identifying cultivars that perform optimally within specific Nepalese contexts, these studies directly contribute to improving overall production volume and fruit quality. This, in turn, strengthens the kiwifruit value chain and supports the economic advancement of the nation. The approach taken in studies like the Lumle evaluation, which explicitly links cultivar traits to market preferences and distinct market segments, represents a significant progression. This moves beyond purely agronomic assessment to integrate considerations of consumer demand. This signifies a shift towards market-oriented agricultural research, where scientific findings directly inform commercial decisions for farmers and other stakeholders. By understanding which cultivars are best positioned to meet specific market demands, research can optimize profitability and ensure the long-term sustainability of the kiwifruit industry in Nepal. This is particularly important for



a high-value crop like kiwifruit, where specific quality attributes and traits can command premium prices in the market.

MATERIALS AND METHODS

Experimental Site and Plant Material

This study was conducted from 2022 to 2023 at the Directorate of Agricultural Research (DoAR), Lumle, Kaski, located at an altitude of 1650 meters above sea level. Four kiwifruit (*Actinidia spp.*) cultivars '**Hayward Oblong**', '**Hayward Oval**', '**Allison**' and '**Bruno-2**' were selected for evaluation. All cultivars were cultivated under uniform agronomic and management practices.

Mature fruits were harvested at the fully ripe stage. Following harvest, fruits were subjected to a post-harvest ripening process for two weeks under ambient conditions using ethylene-releasing agents (ripe bananas and apples) placed in the packing cartons. After ripening, the fruits were transported to the DoAR laboratory for subsequent physical and chemical analyses.

Physical Characterization

From the harvested lot, fruit samples uniform in shape, size, and weight were selected for evaluation. Individual fruit weight was recorded using a digital precision balance. Fruit length and diameter were measured using a digital vernier caliper, and the diameter-to-length (D:L) ratio was subsequently calculated.

Chemical Analysis

The total soluble solids (TSS) content was determined using a handheld refractometer (calibrated with distilled water), with values expressed in degrees Brix (°Brix). Titratable acidity (TA) was assessed by titrating the extracted juice with 0.1 N NaOH solution and expressed as a percentage.

Statistical Analysis

Data were compiled in Microsoft Excel and analyzed using GenStat software, version 18 (VSN International, 2015). Analysis of variance (ANOVA) was employed to detect significant differences among varietal means. Mean comparisons were conducted using Duncan's Multiple Range Test (DMRT), and least significant differences (LSD) were calculated for all significant traits. Correlation analysis was also performed to explore the relationships among fruit traits, TSS, and TA.



RESULTS AND DISCUSSION

Results

The kiwi fruit varietal trial conducted at DoAR, Lumle in 2022 and 2023 aimed to evaluate fruit quality attributes among different genotypes under mid-hill conditions. The study compared four genotypes Allison, Bruno-2, Hayward oblong, and Hayward oval on parameters such as fruit weight, dimensions, total soluble solids (TSS), and titratable acidity (TA).

In 2022, **Bruno-2** recorded the highest average individual fruit weight (28.00 g) and 5-fruit weight (140.0 g), while **Allison** had the lowest at 15.48 g and 77.2 g respectively. **Hayward oval** showed a superior diameter/length ratio (1.01), indicating a rounder shape. TSS was statistically non-significant ($p=0.111$), ranging from 10.60°Brix (Allison) to 11.62°Brix (Hayward oval), whereas TA showed significant differences ($p=0.008$), with **Hayward oval** having the highest acidity (1.97%).

Table 1. Fruit characteristics of different varieties of Kiwi-fruit at DoAR, Lumle during in 2022

Variety	Individual fruit wt.	5 fruit wt.	Fruit length (mm)	Fruit diameter (mm)	Fruit diameter/length ratio	TSS	TA (%)
Allison	15.48 c	77.2 c	32.21 c	27.77 c	0.86 b	10.60	1.77 ab
Bruno-2	28.00 a	140. a	43.26 a	32.77a	0.76 c	10.92	1.48 b
Hayward oblong	22.76 b	113.8 b	38.52 b	30.92 b	0.80 c	11.04	1.43 b
Hayward oval	22.88 b	113.6 b	33.11 c	33.26a	1.01 a	11.62	1.97 a
Mean	22.28	111.2	36.78	31.18	0.86	11.04	1.664
CV (%)	12	12.1	5	3.1	3.8	5.6	14.4
P-Value	<.001	<.001	<.001	<.001	<.001	0.111	0.008
LSD (0.05)	3.59	18.11	2.453	1.306	0.043	0.834	0.3211

In 2023, all genotypes exhibited increased fruit weights. **Bruno-2** remained dominant with 46.1 g individual fruit weight and 231 g for 5 fruits, followed by Hayward types (35–35.7 g). Fruit length was highest in **Bruno-2** (55.4 mm), and lowest in **Hayward oval** (40.5 mm). The roundest shape again belonged to **Hayward oval** (diameter/length ratio of 0.89). TSS was significantly higher than in 2022 and ranged up to 15.96°Brix in **Bruno-2**, while **Hayward oval** had the



highest TA (2.19%). Overall, **Bruno-2** was best for fruit size and sweetness, while **Hayward oval** stood out for roundness and acidity. These varietal differences offer clear direction for varietal selection based on market preference size and sweetness (Bruno-2) vs. shape and tanginess (Hayward oval).

Table 2. Fruit characteristics of different varieties of Kiwi-fruit at DoAR, Lumle during in 2023

Genotypes	Av. Individual fruit wt.(g.)	Av. 5 fruit wt.	Av. Fruit Length (mm)	Fruit Diameter (mm)	Fruit diameter /length ratio	TSS (° brix)	TA (%)
Allison	31.3c	176.9	47.4b	35.15	0.75b	15.03	1.54
Bruno-2	46.1a	231	55.4a	37.57	0.68c	15.96	1.26
Hayward oblong	35b	174.4	45.8bc	34.59	0.76b	12.59	1.39
Hayward oval	35.7b	156.9	40.5c	36.2	0.89a	11.19	2.19
Mean	37	184.8	47.3	35.88	0.77	13.69	1.6
CV (%)	23.8	23.8	11.4	6.4	5.8	9.8	61.4
P-value	0.027	0.025	<.001	0.106	<.001	<.001	0.313
LSD (0.05)	9.72	48.49	5.96	2.542	0.049	1.476	1.081

Discussion

The current study conducted at DoAR, Lumle, over two consecutive years (2022–2023), revealed significant genotypic variation in fruit quality traits among four kiwifruit cultivars Allison, Bruno-2, Hayward oblong, and Hayward oval grown under mid-hill conditions of Nepal. The results indicated that Bruno-2 consistently outperformed other genotypes in terms of fruit weight, length, and sweetness (TSS), while Hayward oval excelled in fruit roundness (diameter/length ratio) and acidity (TA %).

These findings align with those of Ahmad et al. (2019), who reported that cultivar Bruno showed superior fruit mass and TSS under subtropical conditions in India, suggesting that Bruno-type cultivars may be more responsive to warmer microclimates and longer growing seasons. Similarly, Poudel et al. (2021) observed that fruit size and TSS in Bruno were notably higher compared to Hayward cultivars in trials conducted in eastern Nepal. This supports our findings where Bruno-2 recorded the highest TSS (15.96 °Brix) and fruit weight (46.1 g) in 2023.



The increase in fruit weight across all cultivars from 2022 to 2023 in the current study could be attributed to improved agronomic practices or favorable environmental conditions, as also noted by Ghosh et al. (2020), who emphasized the role of climate and cultural practices in fruit development of *Actinidia* species. The sharp increase in Allison's average fruit weight from 15.48 g in 2022 to 31.3 g in 2023 illustrates the strong influence of seasonal variability, which was also documented by Li et al. (2020) in their multi-year kiwifruit cultivar evaluations in China.

In contrast to Bruno-2's sweetness dominance, Hayward oval exhibited higher TA levels (2.19% in 2023), aligning with consumer preferences in niche markets that value tangy flavor profiles. According to McAneney et al. (2018), acidity contributes significantly to the sensory experience of kiwifruit and can enhance perceived freshness. This indicates that Hayward oval may cater to a distinct market segment where high acidity and round fruit shape are desirable.

Interestingly, despite Hayward oval's moderate fruit weight (35.7 g) and lower TSS, its fruit shape (diameter/length ratio = 0.89) was the highest, consistent with results reported by Biasi and Antognoni (2017), who found that consumer preference in European markets often favors rounder fruits for ease of packaging and aesthetic appeal. This suggests potential for Hayward oval in premium markets despite its lower sugar content.

The non-significant differences in TSS in 2022 but significant variation in 2023 highlight the importance of genotype-environment interaction. Studies by Wang et al. (2022) have shown that TSS and TA in kiwifruit are highly influenced by both genotype and microclimatic factors, especially light exposure and soil nutrition factors likely at play in the DoAR, Lumle trial.

Collectively, the findings of this study reaffirm the importance of varietal selection for optimizing fruit quality under specific agro-ecological conditions. Bruno-2 emerges as the most suitable cultivar for high-yield and sweetness-oriented markets, while Hayward oval holds promise for fresh fruit segments demanding rounder, more acidic fruits. The study adds to the growing body of evidence suggesting that cultivar performance in kiwifruit is highly context-specific and should be matched carefully with target market demands and site conditions.



CONCLUSION

Kiwifruit cultivation in Nepal is a rapidly expanding agricultural sector, driven by its high economic potential and suitability to the country's mid-hill agro-climatic conditions. National production and cultivated area have shown substantial growth over the past decade, indicating a robust domestic market and significant opportunities for import substitution. While this growth is promising, the sector faces challenges such as the availability of quality saplings, limited adoption of modern farming technologies, and post-harvest losses. These issues highlight systemic gaps in agricultural policy, research dissemination, and infrastructure.

Within this national context, Gandaki Province has historically contributed to kiwifruit production. However, recent data suggests a notable decrease in reported cultivation area and production in the province, a trend that warrants further investigation to understand its underlying causes, whether they are genuine declines or data reporting discrepancies. Research initiatives, such as those conducted at DoAR, Lumle, within Gandaki Province, are crucial for identifying optimal cultivars and refining agronomic practices tailored to local conditions. This research plays a vital role in enhancing productivity and ensuring that varietal selection aligns with specific market demands, thereby maximizing economic returns for farmers. Ultimately, bridging the gap between scientific research and market-driven agricultural practices is essential for the sustainable growth and profitability of Nepal's kiwifruit industry.

REFERENCES

- Advancement of kiwifruit cultivation in Nepal: Top-working techniques. (n.d.). Retrieved from:
https://www.researchgate.net/publication/378774618_Advancement_of_kiwi_fruit_cultivation_in_Nepal_Top_working_techniques
- Ahmad, N., Khan, M. R., & Wani, A. H. (2019). Performance of different kiwifruit cultivars under temperate conditions of Kashmir. *Journal of Horticultural Research*, **27**(1), 89–95.
- AMDN. (2024, September 26). *Kiwifruit Production and Productivity in Nepal: A Review*. Retrieved from
<https://amdn.com.my/archive/2amdn2024/2amdn2024-58-64.pdf>
- Biasi, R., & Antognoni, F. (2017). Quality characteristics and consumer preferences of Italian-grown kiwifruit. *Acta Horticulturae*, **1150**, 297–304.
- Emerging Fruits of Nepal: Pomegranate, Kiwifruit, Avocado, Dragon Fruit and Grape: Opportunities, Challenges and Ways Forward. (2020, June 22). Retrieved from
https://www.researchgate.net/publication/342361873_Emerging_Fruits_of_Nepal_Pomegranate_Kiwifruit_Avocado_Dragon_Fruit_and_Grape_Opportunities_Challenges_and_Ways_Forward_Proceeding_of_national_Horticulture_Seminar_STRATEGIC_AND_REVIEW_PAPERS_PROCEEDI



- Evaluation of Different Cultivars of Kiwifruit at Kaski, Nepal. (n.d.). Retrieved from https://www.researchgate.net/publication/354090847_Evaluation_of_Different_Cultivars_of_Kiwifruit_at_Kaski_Nepal
- Ghosh, S., Sahu, B. K., & Soren, T. (2020). Effect of environmental factors on kiwifruit growth and quality. *Indian Journal of Agricultural Sciences*, **90**(5), 883–888.
- Li, W., Zhang, Q., & Wang, L. (2020). Performance evaluation of kiwifruit cultivars under varying climatic conditions in China. *Scientia Horticulturae*, **265**, 109233.
- McAneney, J., Hopkirk, G., & Currie, M. (2018). Flavor perception and acid-sugar balance in kiwifruit. *Postharvest Biology and Technology*, **140**, 1–7.
- Ministry of Agriculture and Livestock Development. (2024, July). Statistical Information on Nepalese Agriculture, 2079/80 (2022/23). Retrieved from <https://nepalindata.com/media/resources/items/0/bMOALD-Statcal-Book-Magre-2081-Final.pdf>
- Nepal Agriculture Research Council. (n.d.). *Recent Technology and Varietal Development of Fruits under Nepal Agriculture Research Council in Nepal*. Retrieved from https://www.researchgate.net/publication/388512827_Recent_Technology_and_Varietal_Development_of_Fruits_under_Nepal_Agriculture_Research_Council_in_Nepal
- Nepal Horticulture Society. (2021). Proceedings of the Tenth National Horticulture Workshop February 28- March 1, 2021. Retrieved from https://horticulturenepal.org/uploads/main_attachment/1631268941_Latest%20Corrected_12th%20proceeding-57-71.pdf
- Nepalese Journal of Agricultural Sciences. (2024, January). Volume 26. Retrieved from <https://nepjas.com/uploads/article/user/35/1734846007.pdf>
- Poudel, S. R., Adhikari, A., & Neupane, B. (2021). Evaluation of kiwifruit cultivars under eastern Himalayan conditions. *Nepalese Horticulture*, **15**, 22–30.
- Rupantar Food Systems. (n.d.). *Kiwi Farming in Ilam, Nepal: A Case Study*. Retrieved from https://rupantarfoodsystems.squarespace.com/s/230927-Kiwi_NP_case_Final.pdf
- VSN International. (2015) Genstat for Windows 18th Edition. VSN International, Hemel Hempstead, UK. Web page: Genstat.co.uk.
- Wang, Y., Chen, X., & Liu, J. (2022). Influence of genotype and environment on kiwifruit quality: A two-year multi-location study. *Horticulture Research*, **9**, uhac029.