

related to their visual beauty. More importantly, buckwheat flowers can combine agricultural seasons, local food culture, and ethnic or regional identity into a short but emotionally recognizable rural experience.

In recent years, the Hahaheba tobacco-growing area in Mianning County, Liangshan Yi Autonomous Prefecture, Sichuan Province, has developed a representative “buckwheat flower sea + agro-cultural tourism” model. After tobacco harvesting, local farmers use winter fallow land to rotate with buckwheat, creating large white flowering fields in autumn. During the flowering season, the buckwheat flowers appear “like snow covering the fields,” forming impressive rural scenery together with mountains, villages, and tobacco fields. The local government even organized the first “Buckwheat Flower Festival,” which attracted more than 30,000 visitors for sightseeing, photography, and rural tourism experiences. Unlike traditional agricultural tourism focused only on crop viewing, Mianning integrated buckwheat flower landscapes with grain–tobacco rotation systems, Yi ethnic culture, local food experiences, and rural leisure activities. Visitors can not only enjoy the flower fields, but also participate in buckwheat food preparation, farming activities, stargazing camping, and local barbecue consumption. Local households have also benefited from flower tourism through farmhouse businesses, sales of local agricultural products, and livestream e-commerce activities.

7.2 Integration with rural revitalization strategies

Weining Yi, Hui and Miao Autonomous County in Guizhou Province is one of the three major Tartary buckwheat production regions in China and has long been known as the “Buckwheat Plateau.” In recent years, the county has gradually formed an integrated development model combining Tartary buckwheat cultivation, deep processing industries, and ecological tourism. Supported by its cold high-altitude environment above 2,300 m, Weining maintains about 150,000 mu of stable buckwheat cultivation each year, with annual production exceeding 260,000 tons. Several regional brands, including “Mingqiaoxiang,” “Mabaidashan,” and “Qianhe,” have also been developed.

Through policy support for leading enterprises such as Guizhou Weining Qiaoyuan Agricultural Co., Ltd., the county has promoted the development of a complete Tartary buckwheat industrial chain. More than twenty processed products have been developed, including buckwheat rice, buckwheat tea, buckwheat noodles, buckwheat crisps, and flower cakes. These products are sold to many provinces, including Hunan, Guangdong, and Jiangsu. The annual industrial output value exceeds 30 million yuan and has increased the income of thousands of farming households. At the same time, several thousand mu of flowering buckwheat fields have been combined with rural tourism development. In areas such as Bandi Township, Yi ethnic cultural patterns are incorporated into artistic buckwheat field designs. During the flowering season, the plateau buckwheat landscapes appear “snow-like and cloud-like,” attracting large numbers of tourists for photography, sightseeing, and ethnic cultural activities.

8 Current Challenges and Future Development Directions

8.1 Limitations in breeding and production systems

Although common buckwheat (*Fagopyrum esculentum*) and Tartary buckwheat (*Fagopyrum tataricum*) are both important cultivated buckwheat species, the major breeding problems are different between them. The biggest limitation in common buckwheat is its heterostylous flower structure and self-incompatibility system. This biological characteristic naturally promotes cross-pollination, making it difficult to achieve stable homozygous lines and consistent genetic improvement. Therefore, breeding of common buckwheat cannot rely only on traditional population selection. Factors such as S-locus regulation, flower-type ratio, pollination efficiency, and population genetic structure need to be considered together as an integrated breeding problem.

In the future, breeding of common buckwheat should focus more on the utilization of self-compatible materials, pollination control, resistance to seed shattering, and uniform maturity. In contrast, breeding of Tartary buckwheat should pay more attention to stable yield, reduced bitterness, stress resistance, and adaptability to mechanized cultivation. Only by combining genomic breeding, physiological regulation, mechanized farming systems, and region-specific production models can the buckwheat industry move from small-scale specialty cultivation toward stable, standardized, and sustainable production.