Similar integrated morpho-pomological and biochemical assessments have also been applied to local varieties in the Apulia region, such as 'Processotto Nero', 'Natalese Nera', and 'Verde di Natale'. Key indicators, including fruit weight, peel color, ease of peeling, total soluble solids (TSS), and ripening time, were systematically recorded prior to processing (Ferrara et al., 2023).

6.2 Performance under fresh consumption conditions

For fresh consumption, 'Brown Turkey' demonstrates good fruit traits and nutritional quality, ranking relatively high in multivariate comprehensive evaluations. This is mainly attributed to its favorable flavor, texture, juiciness, as well as its vitamin C content and antioxidant-related properties (Koly et al., 2024). These findings suggest that this variety is more suitable as a stable and reliable option for the fresh fruit market rather than a premium cultivar aimed at extreme sensory quality.

6.3 Drying processing performance and product quality

Studies on the drying of 'Brown Turkey' figs indicate that, with appropriate pretreatments—such as soaking in fructose or sucrose solutions and sulfiting-combined with controlled tray drying or oven drying processes, it is possible to obtain dried fig products with a moisture content of about 24% (wet basis). These products can maintain good sugar retention, moderate acidity, mineral content, and relatively high sensory scores, including color, texture, and flavor (Singh and Kaur, 2025). Varieties with better initial fruit characteristics, such as higher fruit weight, better coloration, higher TSS, and easier peeling, tend to perform better in consumer preference evaluations, where appearance and pleasant flavor are the main factors driving acceptance.

7 Cultivation and Management Practices

7.1 Agronomic measures affecting fruit quality

Moderate deficit irrigation can improve the quality and storage life of fresh figs, but excessive water stress reduces gas exchange, promotes leaf drop, and shortens the production cycle (Ammar et al., 2020). Under semi-arid conditions, controlling irrigation at about 85%~95% of crop evapotranspiration (ETc) can optimize yield, water use efficiency, and fruit quality. At the same time, potassium fertilization can partly alleviate water stress (Moura et al., 2023). Integrated water-fertilizer management and balanced application of N-P-K fertilizers can significantly increase yield, fruit size, total soluble solids (TSS), sugar content, and ascorbic acid compared with rainfed or low-input systems (Ali et al., 2025). Pruning intensity and timing (closely related to phenological stages) are also important, helping balance vegetative growth and fruiting, and improving marketable yield and fruit size (Pereira et al., 2017).

7.2 Harvest timing for dual-use optimization

Fig is a climacteric fruit and is highly perishable, so harvest maturity strongly affects quality. Fruits harvested at higher maturity ("tree-ripe") have higher single fruit weight, soluble solids content (SSC), and SSC:TA ratio, but lower acidity and firmness, and are more acceptable to consumers than those harvested at "commercial maturity" (Crisosto et al., 2010). Under dry conditions in India, the best eating quality usually occurs 7~8 weeks after syconium development. Early harvesting can cause cell structure disorder, while overripe fruits have high water content, poor texture, and are more prone to cracking and decay (Singh et al., 2023). For dual purposes (fresh consumption and processing), fruits for long-distance fresh markets should be harvested at slightly lower maturity, while fully ripe fruits are more suitable for local consumption or drying.

7.3 Regional adaptability and environmental effects

Fig cultivars show strong genotype × environment interaction. Different cultivars vary greatly in yield, earliness, and TSS, so selection should be based on local climate conditions and market timing. Differences also exist among cultivars in photosynthetic efficiency, oxidative stress indicators, and drought tolerance, highlighting the need to match cultivars with irrigation regimes according to local water availability (Ammar et al., 2020). Climate change, including rising temperatures and reduced rainfall, together with pest and disease pressure, has already led to yield decline in some Mediterranean regions (Mellal et al., 2023).