

Bagging also reduces surface contamination by pesticide residues, which is an important part of fruit protection in a food-safety sense. In two white table grape cultivars, all bagging treatments greatly reduced agrochemical residues at harvest, and review evidence likewise emphasizes that bags physically block agrochemical deposition onto the fruit surface during preharvest spraying (Luca et al., 2023; Kiran et al., 2020). This residue-reduction effect strengthens the role of bagging as a surface-management tool for residue-sensitive fresh-market grapes.

Protection effects may also extend into postharvest behavior by altering the microbial ecology of the fruit surface. Although demonstrated in pear rather than grape, bagging maintained higher fungal diversity on the fruit surface, increased non-pathogenic or antagonistic fungi, and reduced postharvest decay, suggesting a plausible biological route by which preharvest surface shielding can lower later spoilage risk; in stored grapes, protective packaging systems that better control fungal decay likewise improve fruit preservation during storage (Figure 1) (Gao et al., 2022). Overall, the evidence indicates that fruit bagging protects grape surfaces through combined physical exclusion, residue prevention, and disease-suppression mechanisms.

Fruit bagging protects table grapes from preharvest environmental and biological stresses

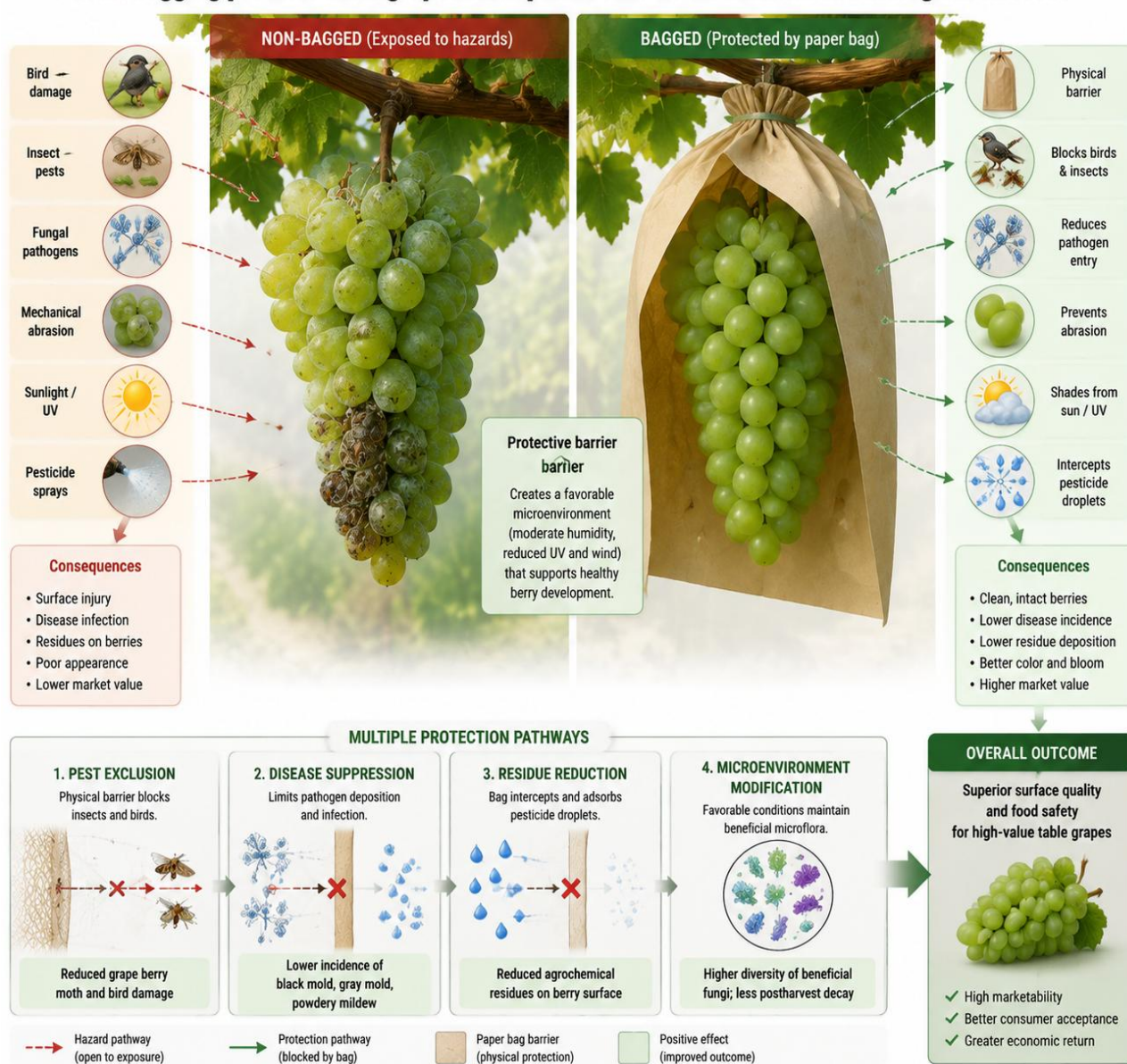


Figure 1 Multifunctional protective mechanisms of fruit bagging in table grapes: physical exclusion, contamination reduction, and surface quality preservation