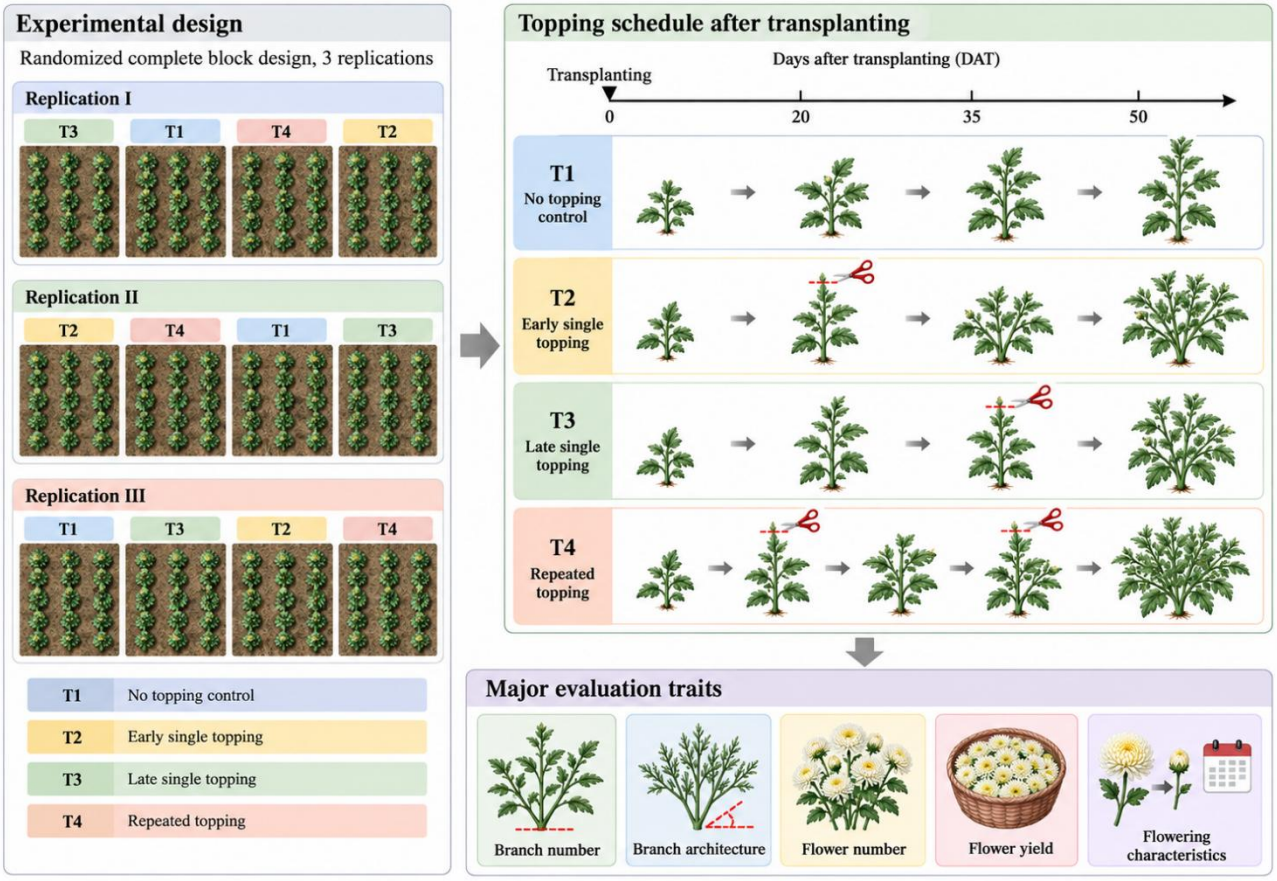

Figure 2 Experimental framework for evaluating different topping methods in Hangbaiju chrysanthemum. The schematic illustrates a replicated randomized field experiment comparing no topping, early single topping, late single topping, and repeated topping, followed by evaluation of branch formation, flowering characteristics, and flower yield

More intensive topping can further increase branch hierarchy and flower number, but it often delays flowering and may not optimize all yield components simultaneously. In annual chrysanthemum, double pinching produced the maximum primary branches and flower yield and was recommended for commercial yield maximization. By contrast, in spray chrysanthemum cv. Shyamal, thrice pinching produced the best vegetative branching traits, but the highest flower number and yield by weight were achieved with pinching twice at 30 and 40 days after transplanting (Das and Patra, 2025).

6.3 Correlations among key traits and selection of the optimal topping method

Trait relationships in a Hangbaiju case study should be interpreted around one central biological link: more effective branch formation usually increases the number of terminal flowering sites, but this advantage must be balanced against flowering delay and changes in single-flower quality. In Hangbaiju itself, shoot branch number is described as crucial for achieving high flower yield because flowers are borne at the tops of branches. Supporting evidence from annual chrysanthemum shows that pinching-induced increases in flower number are associated with vegetative traits such as increased branch number, indicating a positive correlation between branching capacity and reproductive output.

Selection of the optimal topping method should therefore prioritize the treatment that gives the best integrated balance among branch number, canopy spread, flower number, and harvestable yield rather than the tallest plants or the earliest flowering alone. Some systems favor relatively early single pinching, as shown by the Punjab study where pinching at 40 days combined with GA3 produced the highest branch number, leaf number, flower number, and yield per hectare among the tested combinations. Other systems favor moderate repeated topping, and even non-chrysanthemum evidence points in the same direction, with marigold showing maximum flower number and