

long-styled and medium-styled flowers, which possess normal fruit-setting ability, ranged from 43.60% to 75.62%, whereas the proportion of short-styled flowers ranged from 20.47% to 45.51%, and these short-styled flowers essentially lacked fruit-setting ability (Khaleghi et al., 2021). This indicates that eggplant itself exhibits clear differences in floral organ type, which is also an important reason why exogenous plant growth regulator treatments applied during flowering often produce obvious effects. NAA and related treatments can improve floral characteristics and promote initial fruit set; in essence, they increase the fertilization success rate of flowers with fruiting potential.

From the perspective of flowering progress, the regulatory effect of GA₃ is usually more direct. Experimental results showed that treatment with GA₃ at 75 ppm advanced the time to 50% flowering to 51.62 days, compared with 58.87 days in the control, representing an advancement of 7.25 days or about 12.3% (Dewangan and Jangre, 2024). In the same experiment, this treatment produced 4.01 flowers per cluster, indicating that GA₃ can not only accelerate flowering but also help improve flowering quality. This change is of considerable practical significance, because once flowering becomes more synchronized, the subsequent fruit-setting process and harvest period also tend to become more concentrated, thereby creating favorable conditions for yield formation and field management.

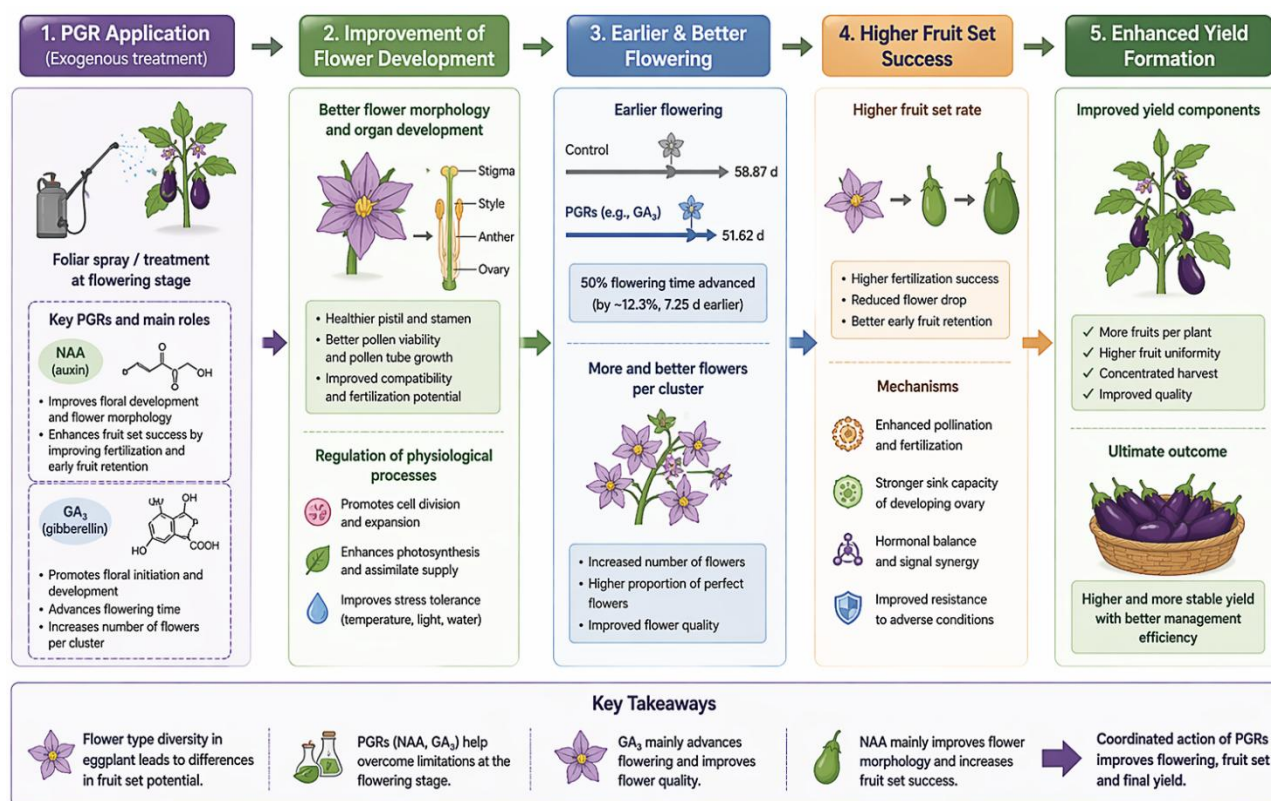


Figure 1 Mechanism of plant growth regulators regulating flowering and fruit set in eggplant

Image caption: This figure illustrates how plant growth regulators regulate flowering and fruit set in eggplant. NAA mainly improves floral development and fruit-setting ability, whereas GA₃ promotes earlier flowering and increases flowers per cluster, jointly enhancing fruit set and yield formation

3.2 Effects on fruit growth and dry matter accumulation

Once fruit set has been completed, subsequent yield formation mainly depends on two key processes: whether cell division is sufficient and whether cell expansion proceeds smoothly. Comparatively speaking, GA₃ tends to play a stronger role in promoting cell elongation and fruit enlargement, whereas auxin regulators often participate in both the cell division and cell expansion stages. Studies have shown that exogenous auxin promotes fruit length increase mainly through the coordinated action of longitudinal cell division and cell expansion, while also