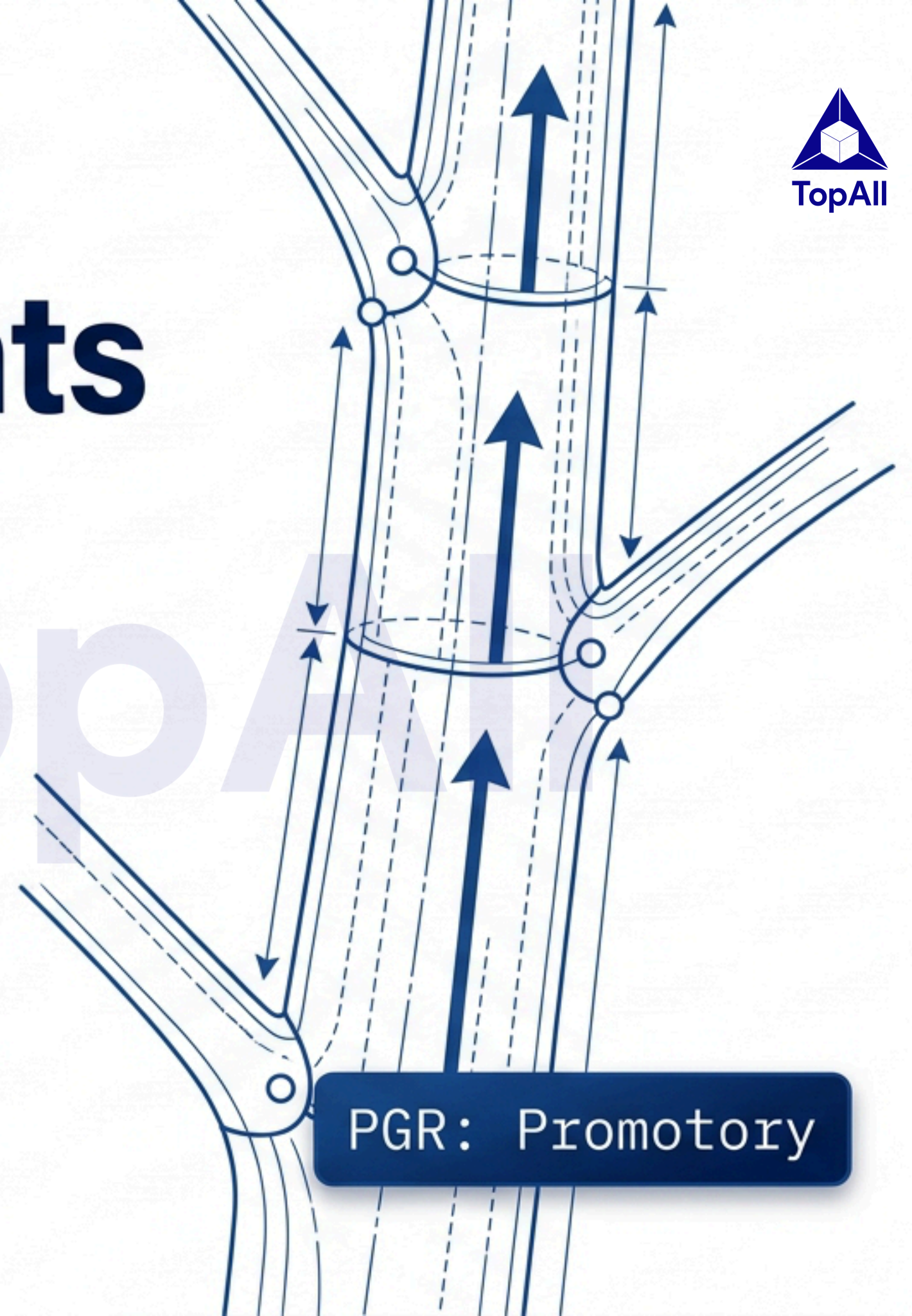


The Hormones That Stretch Plants

How Gibberellins manipulate cellular architecture, spatial growth, and lifecycle timing.



PGR: Promotory

Bakanae ("Foolish Seedling") Disease



Infected rice seedlings grew abnormally tall, spindly, and sterile.

The Culprit



Fungal Pathogen:
Gibberella fujikuroi

The Discovery



1926: E. Kurosawa treated healthy seedlings with sterile filtrates of the fungus, replicating the disease and isolating the active substance:

Gibberellic Acid

GA₃

The Pioneer

Gibberellic Acid (**GA₃**) was one of the first discovered and remains the most intensively studied form in agriculture.

Vast Diversity

Over 100 variants reported from fungi and higher plants (denoted as **GA₁**, **GA₂**, **GA₃**, etc.).

Chemical Nature

All identified Gibberellins are uniformly acidic compounds.



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$$E=mc^2$$



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Key Highlights

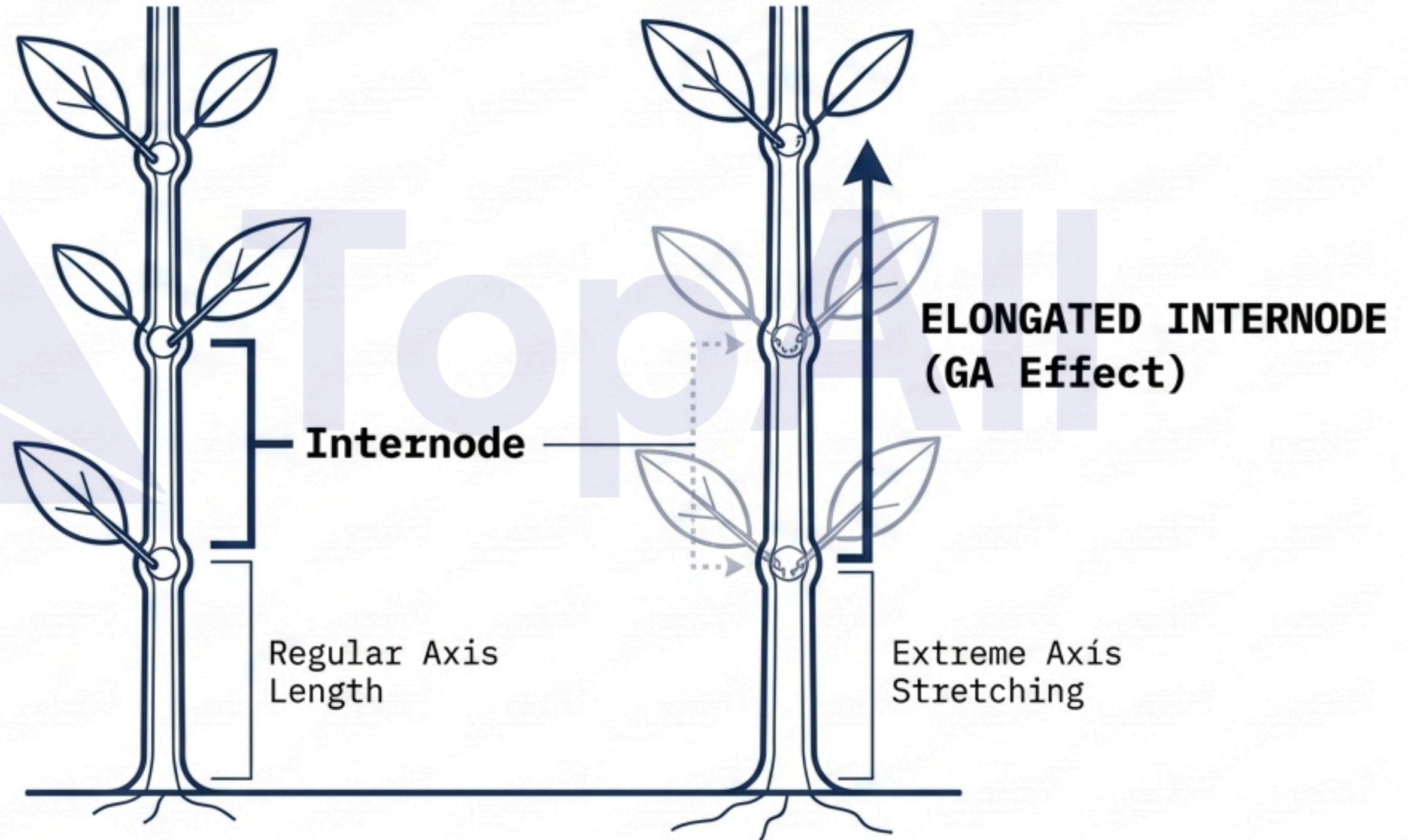
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MORPHOLOGICAL ELONGATION: STEM CROSS-SECTION

DEFAULT STEM

GA-ENHANCED STEM

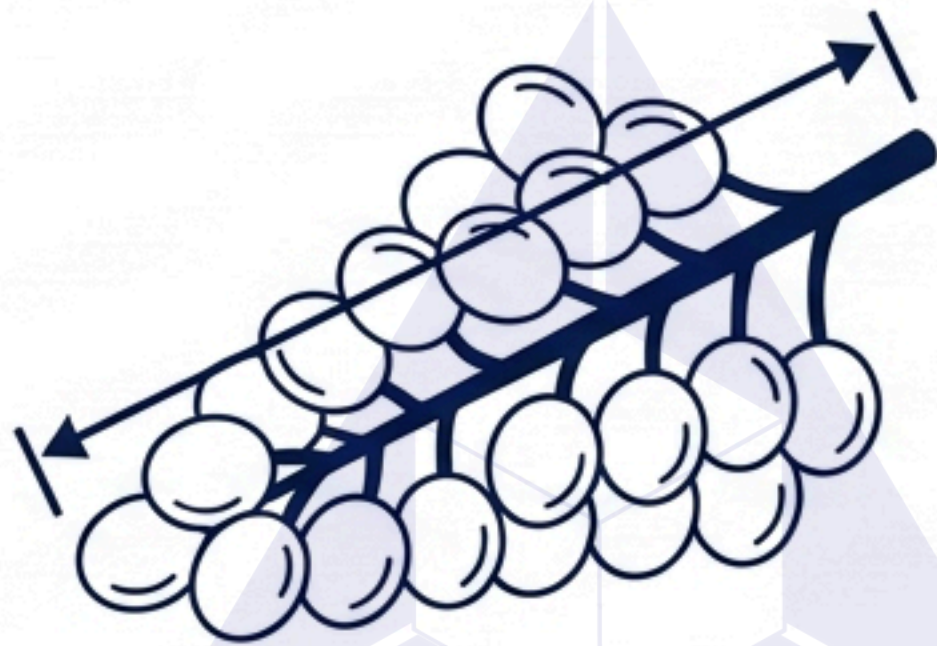


MECHANISM

Gibberellins specifically target the internode and axis, physically increasing the length between structural joints without adding new nodes.

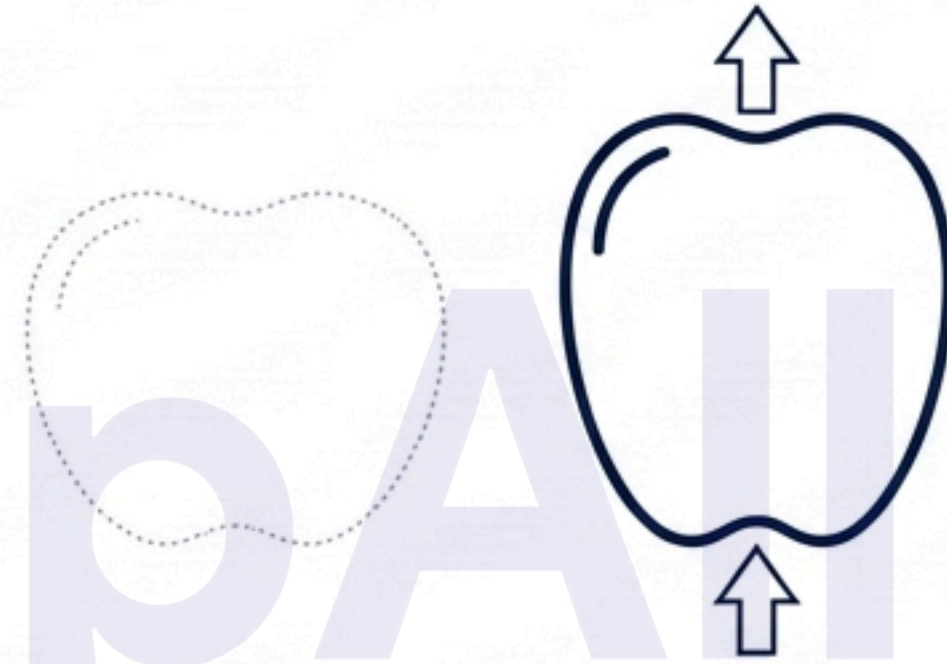
FRUIT DEVELOPMENT & MARKET APPEAL

Grape Stalk Elongation



Increases the length of grape stalks, providing space for larger, uncrowded fruit yields.

Apple Shape Improvement



Causes fruits like apples to elongate, dramatically improving their geometric shape and market appeal.

Dimensional growth directly translates to higher market grading for commercial fruit.

Slowing Time in the Field



Delayed Senescence

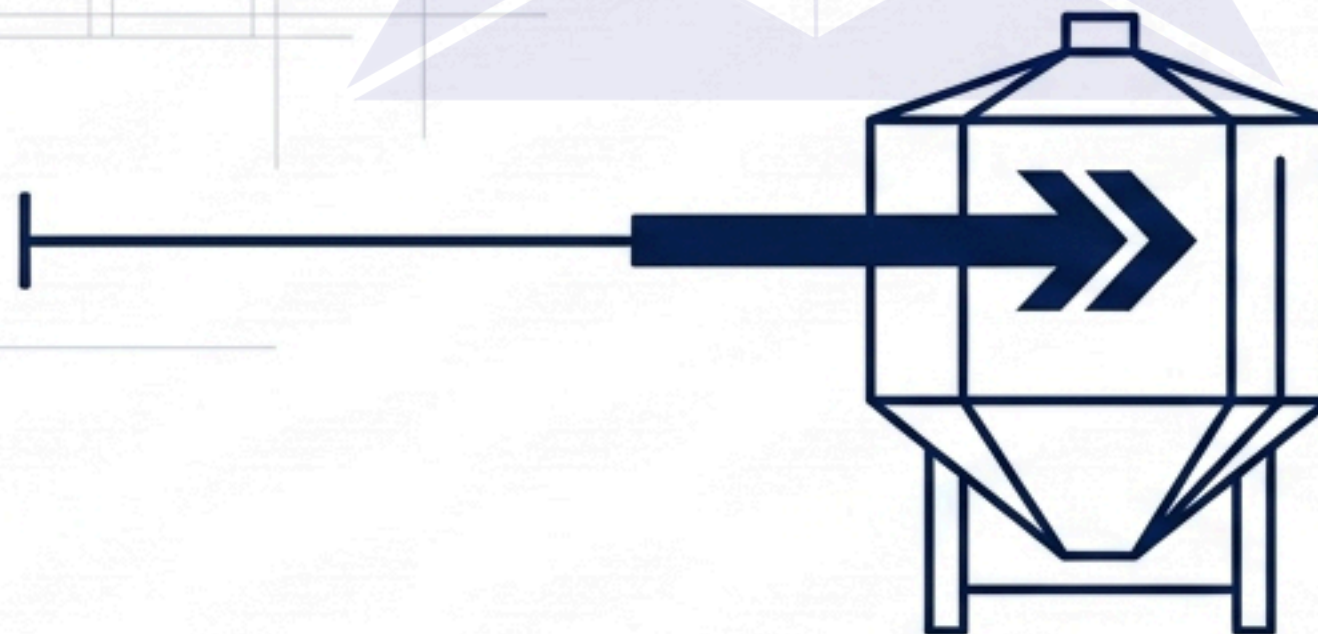


Fruits can be left on the tree longer, actively extending the harvest window and market availability.

Senescence = The biological aging and deterioration of plant tissue.

Speeding Time in the Factory

Accelerated Malting



In the commercial brewing industry, GA_3 sprays are used to speed up the malting process of barley.

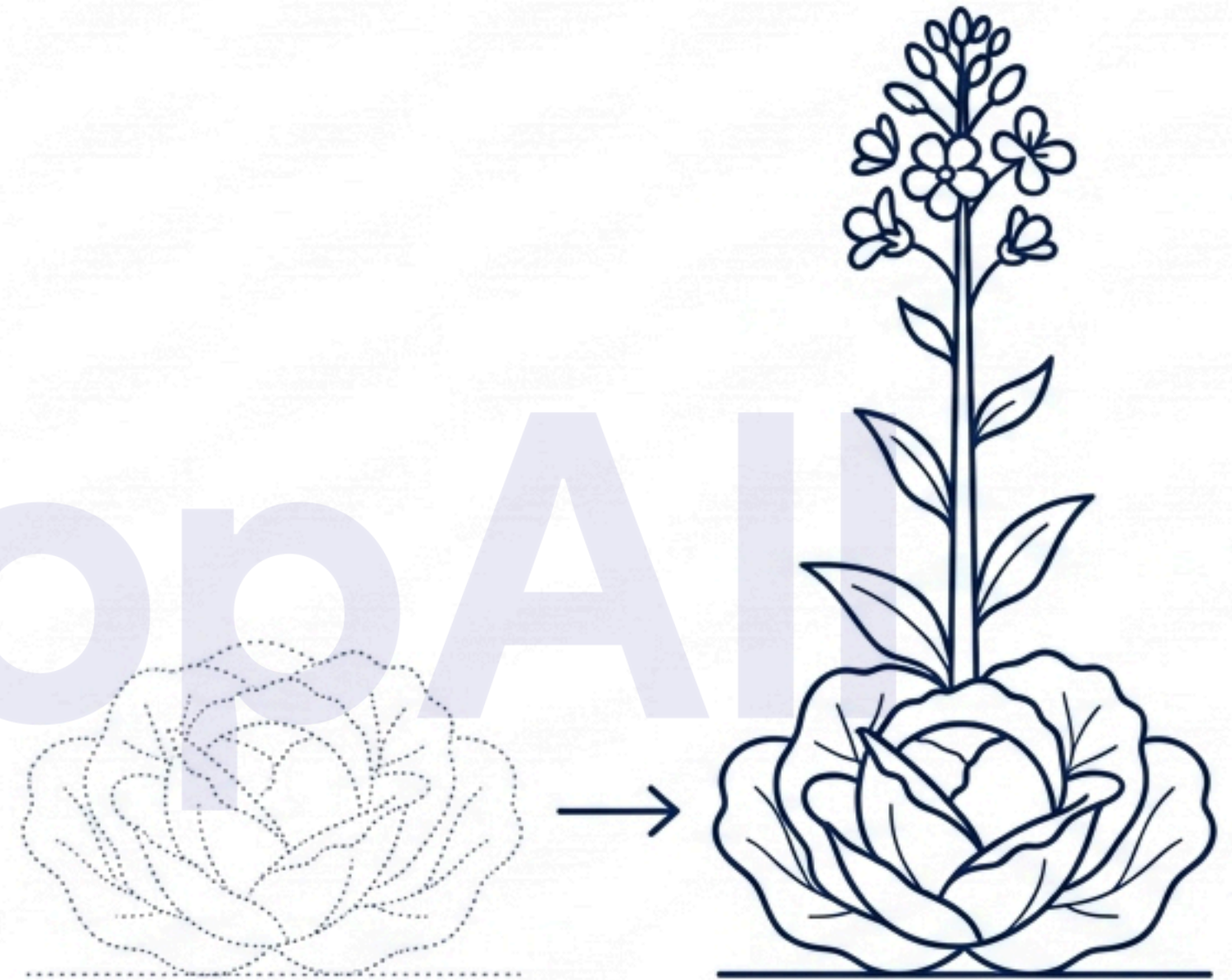
SUGARCANE YIELD

+20 Tonnes/Acre



Sugarcane stores carbohydrates as sugar in stems. Spraying gibberellins dramatically increases internode length, massively scaling total crop yield.

BOLTING & MATURITY



Promotes bolting (extreme internode elongation just prior to flowering) in beet, cabbages, and rosette plants. It also hastens maturity in juvenile conifers for early seed production.

The Four Pillars of Gibberellin Impact



1. Dimensional Growth

Elongating grape stalks and dramatically improving apple geometric shape.



2. Yield Scaling

Driving massive carbohydrate storage in physically extended sugarcane stems.



3. Time Manipulation

Delaying field senescence for late harvest while accelerating industrial malting.



4. Lifecycle Triggering

Inducing bolting in rosette plants and hastening juvenile conifer maturity.

From the anomalous 'bakanae' disease to a foundational pillar of modern agriculture, Gibberellins remain the master architects of plant growth.



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