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Insights into Growth Regulation by Connecting Simulations of Plant-Growth to the Plant Gall Life Cycle

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In Nature, plants must cover all their necessities from locally available resources. They can even extract their main structural building elements (carbon and nitrogen) from thin air. Many non-plant organisms have found ways to manipulate plant growth to their advantage. Gall wasps, for example, can reprogram plants to grow tailored breeding chambers using biochemical substances. Plant growth simulation algorithms have proven to be successful in modeling plant development. This study will investigate a minimum distortion in these established algorithms to simulate the effect of the mechanism used by gall wasps. Connecting the simulation results with detailed observations of galls in Nature is expected to help us understand the effects of the control mechanism exerted by gall wasps. Future research can bridge these findings with advances in biochemical research of gall growth to gain deeper insight into plant growth regulation. Utilizing such natural resource control strategies could solve many of humanity's sustainability problems.

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