Constitutively Active Phytochrome A Alleles that Accelerate Flowering of Long-Day Plants Under Non-Inductive Photoperiods

Tech ID: 34819 / UC Case 2026-486-0

ABSTRACT

Researchers at the University of California, Davis have developed novel phytochrome A variants that accelerate flowering in long-day plants under non-inductive short-day photoperiods.

FULL DESCRIPTION

This technology entails constitutively active, light-labile phytochrome A (phyA) polypeptides, encoded by mutated alleles which can be generated by direct editing the endogenous PHYA locus. Such modifications cause constitutive photomorphogenesis in darkness, enhance far-red light sensitivity and promote precocious flowering in long-day plants under non-inductive short-day conditions. The technology includes transgenic and gene-edited plants expressing these phyA variants and methods to modulate flowering time by restoring phyA signaling in darkness.

APPLICATIONS

- Crop improvement for long-day plants such as cereals, vegetables, and ornamentals.
- Development of cultivars with flexible flowering schedules adaptable to diverse photoperiods.
- Biotechnological tools for controlled modulation of flowering time in agriculture.
- Seed companies offering enhanced genetic traits for early flowering and yield optimization.
- Horticultural products tailored for off-season or controlled environment agriculture.

FEATURES/BENEFITS

- Enables early flowering of long-day plants under short-day and neutral photoperiods.
- Maintains performance despite changes in light intensity, supporting more consistent outcomes.
- Improves photomorphogenic growth under low-light conditions.
- Supports deployment via transgenic expression or gene-editing approaches.
- Eliminates delayed or failed flowering in long-day plants when grown under non-inductive short-day photoperiods.
- Reduces productivity losses caused by photoperiod sensitivity.
- Expands geographic and seasonal cultivation options by reducing dependence on day-length cycles.
- Enables flowering-time optimization without changing environmental conditions (e.g., lighting schedules).

CONTACT

Ediz O. Yonter
eoyonter@ucdavis.edu
tel: .



INVENTORS

- Hu, Wei
- Lagarias, J Clark

OTHER INFORMATION

KEYWORDS

accelerated flowering, constitutively active phytochrome A, gene editing, long-day plants, M423K mutation, photoperiod modulation, plant biotechnology, photomorphogenesis, transgenic plants, flowering time control

CATEGORIZED AS

- **Agriculture & Animal Science**
  - Plant Traits
  - Plant Varieties
  - Transgenics

RELATED CASES

2026-486-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Biological Activity of Constitutively Active YX Alleles of Phytochrome in Plants

© 2026, The Regents of the University of California
Terms of use

1 Shields Avenue, Mrak Hall 4th Floor,
Davis,CA 95616

https://research.ucdavis.edu/technology-transfer/
Fax: 530.754.7620