



Wisconsin Fast Plants™

Seed Stock Profile

F₁ Rosette-Dwarf

Single, recessive trait: *ros/ros*

The F₁ (hybrid) generation is produced by crossing Rosette-Dwarf plants (*ros/ros*) with Standard plants that are homozygous for the wild-type allele (*ROS/ROS*). The resulting F₁ progeny resemble the Standard plants. The F₁ genotype is heterozygous (*ROS/ros*).

The F₂ generation is produced by intermating the F₁ population and harvesting the seeds. The plants in this generation segregate in a 3:1 ratio of phenotypes. (See back page for details.)

Standard plants produce gibberellic acid (GA), a plant growth hormone found in plants that promotes stem elongation. Their genotype is either *ROS/ROS* or *ROS/ros* (abbreviated *ROS/-*).

Rosette-Dwarf plants produce 4-10 times less GA than standard plants. The GA deficiency prevents the hypocotyls and stems from elongating, so the leaves remain near soil level in a rosette, and the plants appear dwarfed. Their genotype is *ros/ros*.

This stock is designed for teaching Mendelian genetics with a monohybrid cross. (See back page for details.)

Length of life cycle: 35-45 days

ROS/-: Days to flowering: 14

Average plant height at day 14: 14 cm

ros/ros: Days to flowering: 16-18

Average plant height at day 16: 6 cm



7-day-old plant
Rosette-Dwarf
(*ros/ros*)



7-day-old plant
Standard
(*ROS/-*)



16-day-old plant
Rosette-Dwarf
(*ros/ros*)

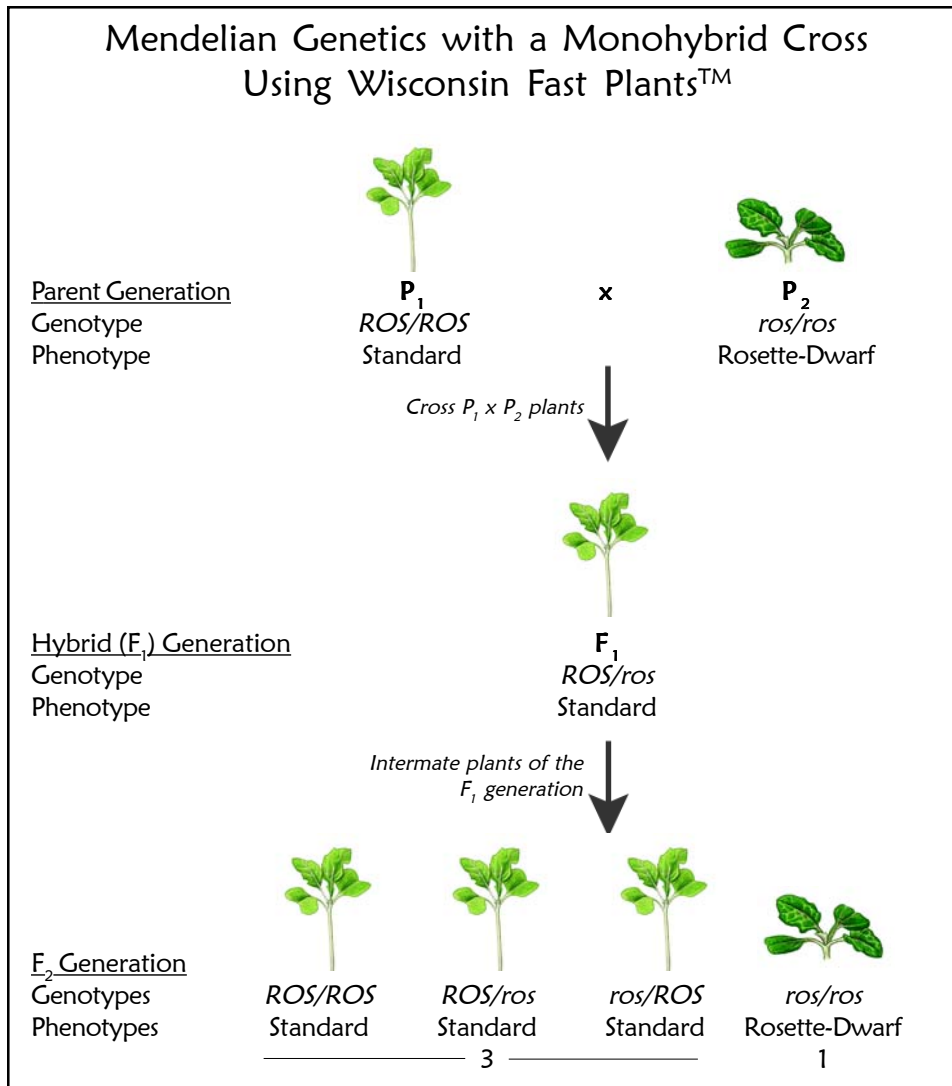


14-day-old plant⁰ cm
Standard
(*ROS/-*)

Growing Tips

- 24-hour fluorescent light, water, and fertilizer are essential for Wisconsin Fast Plants™. Refer to *Growing Instructions* for more details.
- Germination in freshly harvested Rosette-Dwarf seeds is inhibited by the lack of gibberellic acid (GA). To encourage germination, either store seeds in a cool, dry place for 6+ months, or soak newly harvested and dried seeds for 1-2 minutes in a 100 ppm solution of GA. GA treatment produces a seedling with a rosette atop an elongated hypocotyl.
- Prior experience with growing Standard Wisconsin Fast Plants™ is useful for comparison with Rosette-Dwarf.

Mendelian Genetics with a Monohybrid Cross Using Wisconsin Fast Plants™



Written by Wisconsin Fast Plants Program 2001. Layout by Sarah Laufer. Color art by Allison Schroeder. Line art by Amy Kelley.

Tips for a Monohybrid Cross with the Rosette-Dwarf (*ros*) Gene

To ensure high seed yields, follow the *Growing Instructions* carefully. Use extra care when pollinating Rosette-Dwarf plants. Treat the F_2 seeds to overcome the dormancy. (See front page for details.) Expect an approximate 3:1 ratio of plants in the F_2 generation. Due to the random nature of gamete segregation, an exact 3:1 ratio is unlikely. Use the ratio as a foundation for understanding the Law of Segregation. Try graphing the data to see patterns, or do a χ^2 test to estimate the probability of the results. See www.fastplants.org for details about how to do this monohybrid investigation, or a dihybrid investigation.



Wisconsin Fast Plants™ Seed Stocks Available:
Standard • Purple Stem, Hairy • Non-Purple Stem, Hairless
Non-purple Stem, Yellow-Green Leaf • Yellow-Green Leaf • Petite
Rosette-Dwarf • Tall Plant • Variegated • F_1 and F_2 Genetic Stocks

To order Wisconsin Fast Plants™ materials and seeds:
Carolina Biological Supply Company, 2700 York Road, Burlington, NC 27215 1-800-334-5551
Ordering info: www.carolina.com/fastplants Activity ideas: www.fastplants.org