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'Earligreen' a Super-Dwarf Pea Cultivar for Use in Controlled Environment Research

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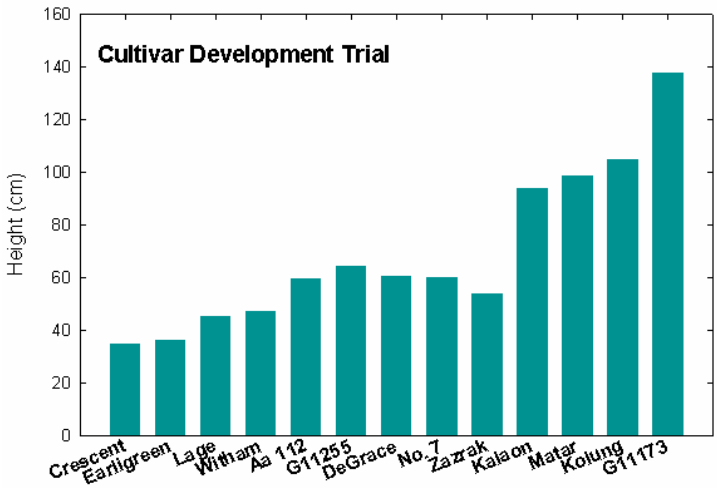
Earligreen is ideal for controlled environment studies due to its fast life cycle, short height, and excellent growth in low light. *Earligreen* peas typically grow 18 to 35 cm tall and flower 20 to 25 days after emergence with the first fresh seed ready at 40 days. Optimal temperature is 20 to 25˚C. *Earligreen* grows well under a wide range of light levels (photosynthetic photon flux (PPF), 100 to 1000 µmol m^{-2} s^{-1}) and a photoperiod of 16 to 24 hours. Leaves display a characteristic silver speckling pattern.

Earligreen was developed in 1950 at the Morden research station in Manitoba, Canada. *Earligreen* (PI 365417) is a hybrid of *Engress* and an unknown early maturing field pea. C. Walkof from the Canada Department of Agriculture donated *Earligreen* seed to the ARS-GRIN network in June of 1971. Germplasm has not been commercially available for at least 20 years.

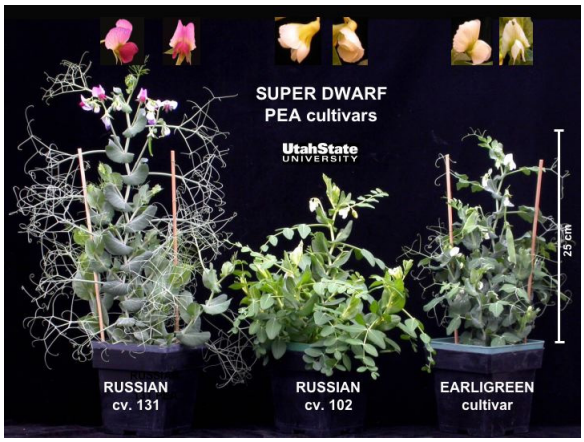
Study 1: Cultivar Development Trial
Earligreen growth and development were compared to twelve other cultivars listed as less than 25 cm tall in the ARS-GRIN database. Plants were greenhouse grown with supplemental high pressure sodium light to provide a sixteen hour photoperiod and were watered twice daily with a dilute nutrient solution. After 43 days plant height and developmental progress were recorded. *Earligreen* plants were first to flower and were shorter than 11 of the selected cultivars.

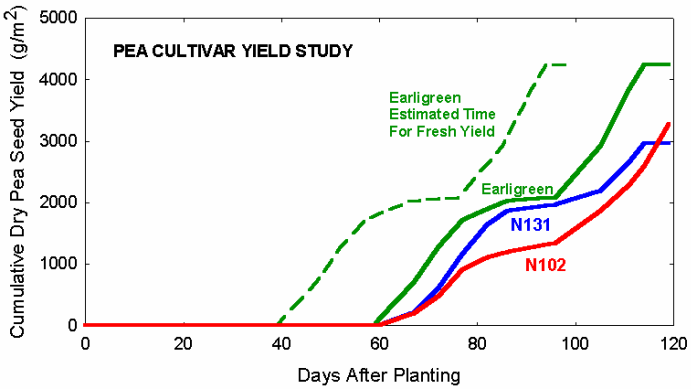
Cultivar	Days to First Flower
Earligreen	20
Zazrak	21
No. 7	21
Matar	24
DeGrace	25
Kalaon	25
Kolung	27
G11255	31
Witham	32
G11173	32
Crescent	>43
Lage	>43
Aa 112	>43



Study 2: Cultivar Yield Study

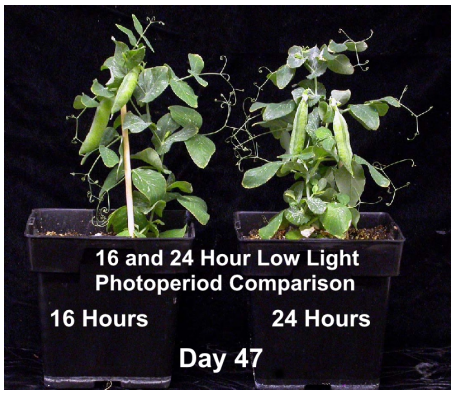
Earligreen was compared to two Russian cultivars (cv. 131 and cv. 102), which have been grown on the International Space Station. Plants were greenhouse grown with supplemental high pressure sodium light to provide a sixteen hour photoperiod and were watered twice daily with a dilute nutrient solution. Fully matured dry pods were harvested. Yield was cumulatively calculated and averaged for each cultivar. *Earligreen* flowered earlier and continuously produced a higher seed yield per unit area.





Study 3: Low Light: 16 and 24 hour Photoperiod Comparison

Earligreen plants were grown under cool white fluorescent lights at a PPF of 90 µmol m^{-2} s^{-1} and a photoperiod of either 16 or 24 hours. Osmocote Plus was mixed into the media with approximately 7 g per 2 L pot. Plants were watered with tap water twice daily. Plants were grown in ambient laboratory conditions. Lab temperature was maintained between 20 and 25˚C. The three replicate plants in each treatment were harvested 65 days after emergence. No evidence of chlorosis was seen in plants grown under either photoperiod. Although time until first flower was unaffected, plants grown under continuous low light had a slightly higher yield and harvest index than those grown using a 16 hour photoperiod.



Parameter	16 hr	24 hr
1st Flower	26	26
Plant Fresh Weight (g)	9.3	9.8
Plant Dry Weight (g)	1.5	1.8
No. Pods per Plant	2.0	1.7
No. Peas per Pod	2.5	3.4
Dry Mass per Seed (g)	0.25	0.27
Yield (g/plant)	1.3	1.6
Harvest Index (%)	46	47