'Green Dixie Blackeye', a Green Cotyledon, Blackeye-type Southernpea

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Additional index words. *Vigna unguiculata*, cowpea, blackeye bean, blackeye pea, vegetable breeding

'Green Dixie Blackeye' is a new southernpea [*Vigna unguiculata* (L.) Walp.] that was released on 28 Apr. 2000 by the U.S. Dept. of Agriculture, Agricultural Research Service (USDA, ARS). The new cultivar produces excellent yields of blackeye-type peas that can be harvested at the dry stage of maturity without loss of the pea's fresh green color. 'Green Dixie Blackeye' is the first blackeye-type southernpea to be released that exhibits the green cotyledon phenotype. It was developed for use by home gardeners and the dry-pack bean industry.

Origin

'Green Dixie Blackeye' was developed over a 10-year period using a pedigree breeding procedure that included a single cross and repeated single-plant selections (Fig. 1). The original cross involved 'Bettergreen', a cream-type pea with green-colored cotyledons, and 'Bettergro Blackeye', a blackeye-type pea with cream-colored cotyledons (Fery and Dukes, 1993; Fery et al., 1993). Intense selection pressure was applied in the F₂ through F₉ generations for the green cotyledon phenotype and blackeye-type seed characteristics. 'Green Dixie Blackeye' originated as a bulk of an F₉ population grown in 1994.

Description

'Green Dixie Blackeye' has a high bushy plant habit (Table 1). It produces dry pods at Charleston, S.C., in ≈71 d, 9 d later than 'Bettergro Blackeye' (Table 2). Flower color is predominately white; the top center of the standard is lightly pigmented (purple), the base of the standard is yellow, and the wing is moderately pigmented (purple) on the back surface. There is a tendency for slight pigmentation (purple) on the stems, at the base of the branches, at the top of the petioles, and at the base and tip of the peduncles. 'Green Dixie Blackeye' has a darker green foliage color than 'Bettergro Blackeye'. Pod set is concentrated, and the pods are borne at foliage level in a scattered fashion. Dry pods are attached to the peduncles in a pendant fashion, and each peduncle typically produces two pods.

A typical 'Green Dixie Blackeye' pod is slightly curved, ≈21 cm long, and contains ≈14 peas (Fig. 2). Pod color is light green when immature, light green with a tendency for slight pigmentation (purple) on the tip when ready for mature-green harvest, and light straw color when dry. The oblong shape of dry 'Green Dixie Blackeye' peas is quite similar to the shape of dry 'Bettergro Blackeye' peas. 'Green Dixie Blackeye' peas have a smooth seedcoat and are somewhat larger than 'Bettergro Blackeye' peas (weight per 100 dry peas: 'Green Dixie Blackeye', 15.6 g; and 'Bettergro Blackeye', 14.4 g). Like 'Bettergro

Blackeye', 'Green Dixie Blackeye' peas have small, black-colored, hilar eyes.

The results of 10-replicate field tests conducted at Charleston, S.C., in 1997 and 1998 indicate that the yield potential of 'Green Dixie Blackeye' is much greater than that of 'Bettergro Blackeye'. Dry pea yields of 'Green Dixie Blackeye' were 116% and 151% of the 'Bettergro Blackeye' yields in 1997 and 1998, respectively. 'Green Dixie Blackeye' was tested as US-867 throughout the southern United States as an observational entry in the 1996 Regional Southernpea Cooperative Trials and as a replicated entry in the 1997 and 1998 trials. During the 3 years of testing in these trials, 'Green Dixie Blackeye' out-yielded the blackeye-type control ('Arkansas Blackeye #1') in 15 of 30 tests.

'Green Dixie Blackeye', like its 'Bettergreen' parent, is homozygous for the *gc* gene that conditions the green cotyledon trait (Fery and Dukes, 1994). The primary color of the seedcoats and cotyledons of field-grown 'Green Dixie Blackeye' peas harvested at the dry-stage of maturity is light olive. The primary color of the seedcoats and cotyledons of 'Bettergro Blackeye' peas harvested at a similar stage of maturity is cream. Dry 'Green Dixie Blackeye' peas imbibed to restore fresh-

Fig. 1. Pedigree of 'Green Dixie Blackeye' southernpea.

Table 1. Plant height, plant width, peduncle length, pod length, and number of peas per pod for 'Green Dixie Blackeye' and 'Bettergro Blackeye' southernpeas, Charleston, S.C., 1999.^z

Cultivar	Plant		Peduncle	Pod	Peas/
	Height (cm)	Width (cm)	length (cm)	length (cm)	pod (no.)
Green Dixie Blackeye	67 a ^y	68 a	41 a	21.0 a	14.0 a
Bettergro Blackeye	62 a	64 a	37 a	18.6 b	13.4 a

^zTrial planted on 2 June 1999. The experimental design was a randomized complete block with 10 replications. Each plot was space-planted, 18 hills per plot, three seeds per hill, 30 cm between hills, and 102 cm between rows.

^yMean separation within columns by Duncan's multiple range test, $P \leq 0.05$.

Received for publication 27 Dec. 2000. Accepted for publication 6 May 2001. The technical assistance of F.P. Maguire is gratefully acknowledged. ¹Research Geneticist.

Table 2. Number of days to harvest, weight per 100 dry peas, and dry pea yield for 'Green Dixie Blackeye' and 'Bettergro Blackeye' southernpeas grown in spring trials, Charleston, S.C., 1997 and 1998.^z

Cultivar	Days to harvest (no.)	Wt/100 dry peas (g)	Dry pea yield (kg·ha ⁻¹)
<i>Spring 1997</i>			
Green Dixie Blackeye	74.0 a ^y	15.4 a	1150 a
Bettergro Blackeye	65.0 b	14.0 b	993 b
<i>Spring 1998</i>			
Green Dixie Blackeye	67.7 a	15.7 a	1353 a
Bettergro Blackeye	58.3 b	14.7 b	896 b
<i>Combined analysis of both trials^x</i>			
Green Dixie Blackeye	70.9 a ^{ns}	15.6 a ^{ns}	1251 a*
Bettergro Blackeye	61.7 b	14.4 b	944 b

^zSpring 1997 and 1998 trials planted on 2 June and 27 May, respectively. The experimental design of each trial was a randomized complete block with 10 replications. Results of combined analyses of both trials indicated a significant cultivar × trial interaction for dry pea yield. Consequently, results are presented for both single trial and combined analyses to aid interpretation.

^yMean separation within columns and trials by Duncan's multiple range test, $P \leq 0.05$.

^{ns}, *Nonsignificant or significant interaction between cultivar and trial at $P \leq 0.05$, respectively.

Fig. 2. Pods and peas of 'Green Dixie Blackeye' southernpea.

harvest pea size and blanched in boiling water for 3 min exhibit a near-fresh green color; similarly treated 'Bettergro Blackeye' peas exhibit a cream color.

'Green Dixie Blackeye' is recommended for use by home gardeners and the dry-pack bean industry. The peas can be harvested not only fresh for immediate consumption or storage in home freezers, but also when fully dry for storage or sale as an attractive dry pack. The dry peas can be imbibed to restore a near-fresh green color.

Availability

Breeder's seed of 'Green Dixie Blackeye' has been released to seed producers. Small samples of 'Green Dixie Blackeye' breeder's seed are available from the author for distribution to all interested research personnel. Genetic material of this release will be deposited in the National Plant Germplasm System, where it will be available for research purposes, including the development and commercialization of new cultivars. It is requested that appropriate recognition of source be given when this germplasm contributes to research or development of a new breeding line or cultivar.

Literature Cited

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