Capsicum annuum L. Midnight Creeper™ and Solar Eclipse™

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The use of ornamental peppers as bedding and garden plants has attracted renewed interest in recent years. An abundance of genetic diversity in Capsicum L. for plant habit and fruit and leaf morphology provides new opportunities for plant breeders to meet demands for new cultivars. Ornamental peppers range in size and shape from short, compact plants with piguin-sized fruits such as ‘Holiday Cheer’ to plants as tall as 1 m with full-sized fruits such as ‘NuMex Mirasol’ (Stommel and Bosland, 2006). Nearly all ornamental peppers have been primarily developed based on unique fLOR characteristics (Bosland and Votava, 2000). Selected breeding of Capsicum accessions has produced new breeding lines and cultivars that combine unique foliar attributes with diverse fruit and plant habit attributes (Stommel and Griesbach, 1993, 2004, 2005).

Horticultural crops have been selected and bred for a number of characters that enhance their visual appeal and suitability for various market applications. Consumer interest in dark purple to black-pigmented landscape and garden plants emerged at least a decade ago with the introduction of dark-leaved coral bells (Heuchera sanguinea Engelm. ‘Palace Purple’) followed by black-leaved Canna species, ornamental grasses (e.g., Miscanthus sp., Pennisetum sp.), and coleuses [Solostelmatiscum scutellarioides (L.) Codd] (Armitage, 2002; Platt, 2004). In short season climates, black foliage provides long-lasting color and year-round color in warmer climates. Black-pigmented plants create a stunning display when combined with soft pastel colors or vibrant reds, yellows, and oranges. Once a novelty, dark purple to black foliaged garden plants are now standard elements to consider in garden design. The recent introduction of ‘Black Magic’ elephant ear [Colocasia esculenta (L.) Schott], ‘Blackie’ sweetpotato vine [Ipomea batatas (L.) Lam.], and the All-America Selection ‘Black Pearl’ pepper (C. annuum L.) has created an increased demand for garden plants with novel foliage colors.

Most of the early cultivars of black-foliaged ornamental peppers were not solidly colored but had purple leaves with brown through dark green coloration. Our breeding efforts ultimately produced pepper plants with solid, true black-pigmented foliage (Stommel and Griesbach, 2005).

In pepper, fruit characteristics are of primary importance for culinary applications, whereas foliar characteristics and growth habit are also of importance for ornamental applications. Delphinidin-3-p-coumaroyl-rutinoside-5-glucoside is the pigment responsible for the black color of pepper foliage (Lichtbourn et al., 2007). Lichtbourn et al. (2008) determined that high concentrations of delphinidin-3-p-coumaroyl-rutinoside-5-glucoside in combination with green chlorophyll pigments produced the characteristic black pigmentation observed in fruits and leaves of true black-hued ornamental pepper genotypes. Anthocyanin pigmentation in pepper is influenced by an incompletely dominant gene, Anthocyanin (A) (Peterson, 1959), and a second gene, modifier of A (MoA) that increases anthocyanin production (Deshpande, 1933).

The U.S. Department of Agriculture, Agricultural Research Service announces the release of two new pepper cultivars, ‘06C84’ (trademarked as Midnight Creeper™) and ‘07C114-1’ (trademarked as Solar Eclipse™). Midnight Creeper™ and Solar Eclipse™ are intended for ornamental applications. These new cultivars display unique combinations of foliar pigmentation, fruiting attributes, and plant habit. Their black foliage, indeterminate prostrate (Midnight Creeper™), and upright (Solar Eclipse™) plant habits and vigor when grown under bedding plant conditions maximize their impact in the garden landscape. Midnight Creeper™ is attractive in mass plantings as a dense groundcover, whereas Solar Eclipse™ provides a novel foundation for garden designs.

Origin

Midnight Creeper™. Midnight Creeper™ is a clonally propagated F1 hybrid selection derived from initial crosses between the USDA pepper germplasm line 90C44 (Stommel and Griesbach, 1993), the heirloom pepper ‘Christmas Cheer’, and a breeding line designated 94C27 that was selected from a population of the heirloom ‘Royal Black’ (Fig. 1A). Line 90C44 is a true-breeding genotype with compact upright growth habit, black foliage, and erect clusters of tabasco-type fruit that mature from black to red. ‘Christmas Cheer’ is a true-breeding variety with a prostrate growth habit, green foliage, and erect clusters of 1.5-cm diameter round fruit that mature from pale yellow to red. ‘Royal Black’ was typified in our observation plots as a bushy plant with variegated green, white, and purple foliage. Breeding line 94C27 was an atypical segregant with non-vaniegated purple foliage that was identified in an open-pollinated population of ‘Royal Black’. Line 94C27 produced solitary pendant tabasco-type pods that matured from purple to red.

Midnight Creeper™ combines anthocya- nin-pigmented foliage from 90C44 and 94C27 and upright-oriented small, round fruit and prostrate growth habit from ‘Christmas Cheer’. Early generation selections focused on identification of individuals with blackish green-pigmented foliage and prostrate growth habit. Recurrent selection for increased intensity of foliar anthocyanin pigmentation resulted in black foliage progeny. Concurrent selection was practiced for solitary round upright-oriented fruit. Selection was also practiced for an indeterminate vigorous growth habit that would perform well season-long under bedding plant conditions. Midnight Creeper™ is an F1 hybrid release resulting from a sibcross of F2 single plant selections. Routine virus indexing is practiced to maintain virus-free plant stocks.

Midnight Creeper™ was trialed under field conditions as both a bedding and container plant in Dearing, GA (heat zone 9) (American Horticultural Society, 1997) and Beltsville, MD (heat zone 7). When grown solitary or massed, growers noted Midnight Creeper’s™ spreading black foliage and small brighty colored upright-oriented fruit (Fig. 2A-C). Midnight CreeperTM is a release made available from a cooperative research and development agreement with McCorkle Nurseries (Dearing, GA) to develop new pepper germplasm with novel fruit, foliage, and plant growth habit.
Solar Eclipse™ was trialed under field conditions in Dearing, GA, and Beltsville, MD. In grower trials, Solar Eclipse™ was noted for its tall habit, vigorous growth, and striking black foliage (Fig. 2D). Solar Eclipse™ is made available from a cooperative research and development agreement with McCorkle Nurseries (Dearing, GA).

**Description**

Midnight Creeper™ and Solar Eclipse™ are diploid (2n = 2x = 24) herbaceous annuals. Midnight Creeper™ and Solar Eclipse™ have been asexually reproduced over successive generations since 2005 by vegetative shoot cuttings at Beltsville, MD, and Dearing, GA. Over that period, no off-types of Midnight Creeper™ or Solar Eclipse™ have been observed. Thus, it is concluded that these cultivars are stable and reproduced true to type. Midnight Creeper™ and Solar Eclipse™ have performed uniformly in multiple trials during later stages of cultivar development. Data reported here were collected from 2006 field trials in Beltsville, MD, and describe relevant ornamental attributes. Field plots were established in late May 2006 from greenhouse-grown transplants and data were collected in Sept. 2006. These new cultivars are contrasted with the recent black foliage ornamental pepper release ‘Black Pearl’ (Stommel and Griesbach, 2005) (Table 1).

**Midnight Creeper™**

Plants produce greater than three basal shoots that grow laterally instead of upright forming a vigorous low prostrate growth habit (height/diameter, 0.40). Growth is indeterminate. Plants average 98 cm in diameter (range, 93 to 102 cm) and 39 cm in height (range, 38 to 43 cm) (90 d posttransplanting). ‘Black Pearl’ plants average 45 cm in diameter (range, 44 to 47 cm) and 31 cm in height (range, 29 to 34 cm) with a height to diameter ratio of 0.70. Midnight Creeper™ leaves and stems are glabrous and glossy. Roots are fibrous. Leaves are simple, entire, symmetrical, and lanceolate with an apiculate tip. Mature leaves average 4.5 cm in length (range, 4.0 to 5.0 cm) and 2.4 cm in width (range, 2.3 to 2.5 cm). Petiole length averages 2.1 cm (range, 2.0 to 2.2 cm). Adaxial leaf surface is black (202A) (Royal Horticultural Society, 1966). ‘Black Pearl’ has larger but similar shaped and colored leaves. ‘Black Pearl’ leaves average 8.2 cm in length (range, 7.4 to 11.0 cm) and 3.5 cm in width (range, 2.9 to 4.5 cm).

**Solar Eclipse™**

Plants produce greater than three basal shoots that grow laterally instead of upright forming a vigorous low prostrate growth habit (height/diameter, 0.40). Growth is indeterminate. Plants average 98 cm in diameter (range, 93 to 102 cm) and 39 cm in height (range, 38 to 43 cm) (90 d posttransplanting). ‘Black Pearl’ plants average 45 cm in diameter (range, 44 to 47 cm) and 31 cm in height (range, 29 to 34 cm) with a height to diameter ratio of 0.70. Midnight Creeper™ leaves and stems are glabrous and glossy. Roots are fibrous. Leaves are simple, entire, symmetrical, and lanceolate with an apiculate tip. Mature leaves average 4.5 cm in length (range, 4.0 to 5.0 cm) and 2.4 cm in width (range, 2.3 to 2.5 cm). Petiole length averages 2.1 cm (range, 2.0 to 2.2 cm). Adaxial leaf surface is black (202A) (Royal Horticultural Society, 1966). ‘Black Pearl’ has larger but similar shaped and colored leaves. ‘Black Pearl’ leaves average 8.2 cm in length (range, 7.4 to 11.0 cm) and 3.5 cm in width (range, 2.9 to 4.5 cm).

Midnight Creeper™ flowers are self-compatible, hermaphroditic, pentameros, and hypogynous. The purple (81A) flowers average 1.5 cm in diameter (range, 1.3 to 1.8 cm) and have purple filaments, styles, and anthers. Flowers of ‘Black Pearl’ are similar. Fruit of Midnight Creeper™ are solitary and are borne upright on 1.6-cm pedicels (range, 1.4 to 2.0 cm). Immature fruit are black (202A) and mature to red (46A). Fruit are globe shaped, have two to three locules, and average 1.2 cm in diameter (range, 1.0 to

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**Fig. 1.** Pedigree for (A) Midnight Creeper™ and (B) Solar Eclipse™.