

What's New in the World of Coneflowers (*Echinacea*)[®]

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INTRODUCTION

Coneflowers (*Echinacea*) are members of the aster or daisy family (Asteraceae). Depending on the taxonomy system utilized, there are nine species, all of which are native to North America (McGregor, 1968). Three of these species, *E. angustifolia*, *E. pallida*, and *E. purpurea*, are of commercial interest for their reputed medicinal properties (Sari et al., 1999). The coneflowers are also popular garden and cut flower subjects. Plants can remain in bloom for long periods of time in garden settings, are quite drought tolerant once established, are adaptable to a range of soil types and pH, and are hardy from U.S.D.A. Zones 3–8. The flowers attract butterflies and honeybees, and the seeds attract birds such as goldfinches. One species, *E. purpurea*, the purple coneflower, is widely cultivated as an ornamental. In its myriad selected forms, it can range from 18 inches to 5 ft in height, and will produce for 2 months or longer numerous flowering heads with showy ray flowers in white to pink to rose-red, and raised purple to golden center disks. Several other species are also cultivated, to a lesser degree, as ornamental plants, including *E. angustifolia* (blacksamson), *E. pallida* (pale purple coneflower), *E. tenesseeensis* (Tennessee purple coneflower), all with light pink to dark rose red flowers, and *E. paradoxa* (yellow coneflower), truly the paradox of the genus with its yellow flowers. None of these latter species have been developed beyond the wild type to any degree.

Coneflowers have surged in popularity in recent years. Factors involved in this include *E. purpurea* 'Magnus' being named the "1998 Perennial Plant of the Year" by the Perennial Plant Association, which greatly boosted sales of this selection and recognition of the genus in general, and the increased popularity in gardening with native plants, which has in turn increased the demand for other coneflowers, such as the yellow-flowered *E. paradoxa*.

There are, as with any group of plants, some downsides to the genus. From the consumer's perspective, plants are often short-lived (3–5 years) in the garden, especially under conditions of poor soil drainage. The genus is, by and large, intolerant of heavy, wet soils (though plants will tolerate a well drained clay soil). Until recently, available selections came in a limited range of flower colors, magenta to pink, or white. The genus is susceptible to aster yellows, though there is evidence that some taxa (*E. angustifolia*, *E. tenesseeensis*) may be more resistant. The flowers of many *E. purpurea* selections are deemed "too stiff" for informal landscapes and naturalistic gardens, as much of the earlier breeding focused on selection for horizontally held ray flowers (often, erroneously, called the "petals" of each flower head).

From a production perspective, seed-grown plants can be variable. The genus is for the main self-incompatible, and so two different genotypes need to be cross-pollinated for successful seed production. Conversely, the genus is very promiscuous, in that different genotypes, both within and between species, can cross and form seed. Unless seed production blocks are well isolated, cross-pollination between different selections will readily occur. Potted plants can be difficult to overwinter. Container-grown plants can also become leggy and weak-stemmed under pro-

duction conditions of high nutrient availability and/or low light intensity. Tissue culture propagation has recently been utilized for production of selected clones; micropropagation protocols still need refinement to ensure crop uniformity, and to increase rooting rates.

Hybridization studies indicate that the different species of *Echinacea* can be crossed, and that many of the interspecific combinations form fertile F1 hybrids (McGregor, 1968; this author, unpublished data). Presumably, novel interspecific hybrids with useful and unique ornamental attributes can therefore be developed. Until recently, there were no intentionally selected interspecific hybrids in commercial cultivation. The challenges to the development of interspecific hybrids are twofold. A reasonably uniform, interspecific-hybrid seed line would in theory take five to seven generations of careful selection to develop. At 2 years per generation under field conditions, the process could well take a decade or longer. Alternatively, individual hybrid plants can be selected and clonally propagated. While coneflowers can be propagated via rooted stem cuttings, root cuttings of the tap-rooted forms, and crown division, the propagation rates via these methods are too low for large-scale, commercial production.

The use of tissue culture propagation in the last 5 years now makes it possible to bring individual clones to the marketplace. The first such introduction, *E. purpurea* 'Kim's Knee High', was selected by former owner of Niche Gardens, Kim Hawks, for its compact habit (to 24 inches in height) and profuse production of flowers with rigidly reflexed, rosy-pink rays. The selection is now being successfully propagated via tissue culture. Many more clonally propagated coneflowers are now following in its path. Conventional breeding of seed cultivars continues as well, both of which are fueling an explosion in new coneflower selection and introduction. The remainder of this paper will focus on some of the new selections in or coming to the marketplace. Ease of commercial production, crop uniformity, garden performance, and the ever elusive fashion dictates of gardening will determine over time which of these selections will become readily accepted and remain in use in our landscapes. But undoubtedly the explosion of new and unique coneflowers coming to market will continue into the future.

NEW CONEFLOWER SELECTIONS

***Echinacea purpurea* 'Doubledecker'**. Produces a whorl of relaxed, rosy-pink ray flowers beneath the cone, then a second cluster of rays emanating from the top of the cone. Unique, and adds a sense of frivolity to the garden. Plants grow to 40 inches tall. Tends to produce normal flowers the 1st year, then flowers with the toponotch the 2nd year. Similar cultivars, all possibly related, include 'Doppelgänger', 'Indiaca', and 'Doubletake'. Hardy to U.S.D.A. Zone 3. The original plant was discovered by German grower Eugen Schleipfer. This seed strain was developed by Jelitto Perennial Seeds and introduced in 2004.

***Echinacea purpurea* 'Fancy Frills' PPAF PVR**. Plants produce large fragrant flowers with multiple rows of shaggy, pink ray flowers and a prominent dark orange red cone. Long-blooming, produces strong flowering stems that grow to 30 inches in height. Hardy to U.S.D.A. Zones 4–9. Tissue culture propagated. Developed by Terra Nova Nurseries; to be introduced in 2005.

***Echinacea purpurea* 'Fragrant Angel' PPAF PVR**. Plants produce large fragrant flowers with horizontally held, broad overlapping white ray flowers and

prominent yellow cones. Plants bloom from midsummer into autumn. Stems are sturdy, and grow to 30 inches tall; hardy to U.S.D.A. Zones 4–9. Tissue culture propagated. Developed and introduced by Terra Nova Nurseries.

***Echinacea purpurea* 'Green Eyes' PPAF PVR.** The robust flower heads carry horizontally held ray flowers that are a vibrant magenta color. The showy cones are at first indented and are distinctly green; as the cones mature they form rich orange domes. The two-toned cones are appealing, as are the long-lasting blooms and a long blooming season. Fragrant. Hardy to U.S.D.A. Zones 4–9. Tissue culture propagated. Developed by Terra Nova Nurseries; to be introduced in 2005.

***Echinacea purpurea* 'Hope' PPAF PVR.** Large, soft pink flowers atop strong stems to 30 inches tall; fragrant and long blooming. Terra Nova Nurseries will make a donation for each plant sold to the Susan G. Komen Foundation, which funds research to find a cure for Breast Cancer. Hardy to U.S.D.A. Zones 4–9. Tissue culture propagated. The clone was developed by Terra Nova Nurseries.

***Echinacea purpurea* 'Little Giant' PPAF PVR.** A compact selection that grows only to 16 inches tall, yet with full-sized, 5-inch wide flowers that are similar to those of 'Ruby Giant', fragrant, with horizontally held, fringed, and broadly overlapping red-purple ray flowers, a prominent orange disk, and finer, dark green foliage. Hardy to U.S.D.A. Zones 4–9. Tissue culture propagated. The clone was developed by Terra Nova Nurseries.

***Echinacea purpurea* 'Prairie Frost' PPAF PVR.** A selection with two-toned, green and creamy yellow variegated foliage. Stems are upright and slender, producing cute button-like flowers only 3 inches across, with rose pink rays. Plants are compact, growing to 26 inches tall. The plant was trialed for a number of years to ensure the variegation was stable. Hardy to U.S.D.A. Zones 4–9. Tissue culture propagated. The clone was selected by Alan Costa from the seed strain 'Bravado', and introduced by Terra Nova Nurseries.

***Echinacea purpurea* 'Ruby Giant' PPAF PVR.** A clonal selection made from the seed strain 'Rubinstern'. Produces large flowers, 5-7 inches wide with a double row of horizontal, clear pink rays, each with an upturned tip. Stems are multibranched and multiflowered; very fragrant. Grows to 30 inches tall. Hardy to U.S.D.A. Zones 4–9. Tissue culture propagated. Developed by Terra Nova Nurseries.

***Echinacea purpurea* 'Sparkler' PPAF PVR.** Another variegated selection, this plant boasts medium green foliage that emerges in the spring with dramatic white frosting and green speckling. The leaves turn greener in the summer. Rose pink, 4-inch flowers. Compact, to 26 inches tall. Hardy to U.S.D.A. Zones 4–9. Tissue culture propagated. Developed by Terra Nova Nurseries.

***Echinacea purpurea* 'Razzmatazz' PPAF PVR.** This selection initially produces an open whorl of somewhat short pink ray flowers. Then as the flower head matures, the entire cone becomes covered with densely packed, short ray flowers, eventually forming a shaggy mass of petals. Unique. Stems are slender, and grow to 35 inches tall. Appears to be sterile, no seed production. Tissue culture propagated. Originally selected by Jan van Winsen (Netherlands) as a potential cut flower. Introduced by Darwin Plants.

***Echinacea purpurea* 'Vintage Wine' PPAF PVR.** This richly colored plant produces good-sized flower heads with slightly upturned, deep purple-red ray flowers. Perhaps the closest to red of any current coneflower selections; the upturned rays are unusual as well. Plants grow to 36 inches tall. Developed by Piet Oudolf (Netherlands). To be introduced in 2005 by Darwin Plants.

***Echinacea* 'Art's Pride', Orange Meadowbrite™ coneflower PP.** The first coneflower introduced with orange ray flowers. An interspecific hybrid between *E. paradoxa* and *E. purpurea*. Flower heads are produced on slender stems that grow to 36 inches tall. The long, narrow, vibrant orange-tangerine rays are initially horizontal, and then droop gracefully with age. The disk matures to a deep purple brown color. Flowers emit a strong fragrance reminiscent of sweet, orange-spiced tea. Hardy to U.S.D.A. Zones 4–9. Tissue culture propagated. Developed by the author at Chicago Botanic Garden. Introduced by Chicagoland Grows.

***Echinacea* 'CBG Cone3', Mango Meadowbrite™ coneflower PPAF.** A sport from 'Art's Pride', the plant habit and fragrance is identical, except the ray flowers are mango colored, and the disk a mustard yellow with a green interior. Hardy to U.S.D.A. Zones 4–9. Tissue culture propagated. Introduced by Chicagoland Grows.

***Echinacea* 'CBG Cone2', Pixie Meadowbrite™ coneflower PPAF.** Low growing, stems to 16 inches, densely branched with dark green, very pubescent foliage; perky flowers 2 inches across with flat to slightly upturned pink rays and a dark raspberry cone; should be very drought tolerant. It is a complex hybrid between *Echinacea angustifolia*, *E. purpurea*, and *E. tennesseensis*. Hardy to U.S.D.A. Zones 3. Tissue culture propagated. To be introduced in 2005 by Chicagoland Grows.

***Echinacea* 'Jade' PPAF PVR.** A compact selection that grows to 24 inches tall. The flower heads have green cones surrounded by horizontal, white ray flowers. The ends of the rays look like they have been cut with pinking shears. Well-branched plants. Presumably being propagated from tissue culture. Developed by Piet Oudolf (Netherlands). To be introduced in 2005 by Darwin Plants.

***Echinacea* 'Paranoia' PPAF.** A dwarf plant that grows only 12 inches tall, the flower heads are ringed by droopy, soft yellow rays. Fine textured. May be sterile, no seed production. Another interspecific hybrid of *E. purpurea* × *E. paradoxa*. Hardy to U.S.D.A. Zones 5–8. Tissue culture propagated. Cross made by Richard Saul of Saul Nurseries (Georgia) in the 1990s; seed was shared with Tony Avent of Plant Delights Nursery (North Carolina) who selected out this clone after years of trials.

***Echinacea* 'Sunrise', Big Sky™ sunrise coneflower PPAF.** A vigorous plant that is well branched and grows to 36 inches tall. The flower heads are borne on sturdy stems. The wide, overlapping, slightly drooping rays are an attractive citron yellow. Cones are a good orange color. The flowers have a delightful rose-like fragrance. Hardy to U.S.D.A. Zones 4–8. Developed by Richard Saul, Saul Nurseries (Georgia) from a hybrid cross of *Echinacea purpurea* × *E. paradoxa*.

***Echinacea* 'Sunset' Big Sky™ Sunset Coneflower PPAF.** A vigorous plant that is well branched and grows to 30 inches tall. The flower heads are borne on sturdy stems. The wide, overlapping, slightly reflexed rays are a vibrant orange color,

surrounding darker, orange brown cones. The flowers have a rose-like fragrance. Hardy to U.S.D.A. Zones 4–8. Developed by Richard Saul, Saul Nurseries (Georgia) from a hybrid cross of *E. purpurea* × *E. paradoxa*. Available in 2005.

LITERATURE CITED

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Exploring for New Perennials in Northern China®

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INTRODUCTION

“Why China?” is the question often asked by the non-plant-nut. The answer, of course, is that the climate and soils are very similar to the U.S.A. and many Chinese plants have cousins here; i.e., *Betula*, *Ulmus*, *Pinus*, *Abies*, *Tilia*, *Populus*, *Rosa*, *Clematis*, *Scutellaria*, *Quercus*, etc. They have evolved from the same roots, but on the opposite side of the globe and so they have different interesting and ornamental characteristics, as do the *Penstemon* species that inhabit opposite slopes of the tall mountains in Colorado and Utah.

Because we know the North American relatives, it is easier to evaluate, breed, and select the Asian counterparts in less time. It's not difficult to put a herbaceous perennial on the market in 5 or 6 years and certain shrubs and trees in 10–12 years.

Of course, there are some down sides.

- It's a long hard trip.
- The language barrier; you don't easily learn Chinese and even that won't help you communicate with the Tibetans, Mongols, and Uygers, so you may need a translator who is fluent in three languages to get the whole story.
- The food is different, i.e., mare's milk wine, yak butter, and so forth.
- The plants of Asia have an easier climate because of the larger landmass, I suppose. They aren't subjected to the spikes in temperature we have. Spring warms more gradually and winter comes more or less without the 50 to 60 °F drops that we can have in the Great Plains.