

Plant Evaluation Notes

A Garden Study of Sundrops and Evening Primroses

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Sundrops and evening primroses are easy-to-grow perennials for summer borders and wildflower gardens. Dazzling yellow sundrops glow in the summer garden, warming the border and nourishing butterflies and bees. The delicate blossoms of showy evening primrose belie its vigorous nature, but who can deny the beauty of a blanket of its pale pink flowers? After the flowers have faded, many sundrops and evening primroses mark their passing with a burst of richly colored autumn leaves. *Oenothera* is proof that common garden plants need not be commonplace.

Sundrops and evening primroses are common names for different species of *Oenothera*. Sundrops (or suncups) bloom in daylight, while the flowers of evening primroses open at dusk. However, there are exceptions to this naming rule; for example, showy evening primrose (*Oenothera speciosa*) is decidedly diurnal rather than nocturnal, as the common name would imply. *Oenothera* is a member of the evening primrose family (Onagraceae) and is related to other

garden perennials such as *Fuchsia* and *Gaura*. There are approximately 124 annual, biennial and perennial herbaceous species of *Oenothera* widely distributed in North and South America, while many species have naturalized elsewhere. Conversely, only a handful of species are commonly grown as cultivated garden plants.

Most gardeners are familiar with the cheery yellow flowers of sundrops, either as garden plants or native wildflowers. Although shades of yellow are most common, some *Oenothera* species have pink or white flowers. The cupped- to saucer-shaped flowers consist of four overlapping petals with a silky sheen and a prominent stigma within. The blossoms are borne individually in leaf axils or in terminal clusters atop the foliage in late spring and midsummer.

The leaves of sundrops and evening primroses are typically narrow or lanceolate, and held in basal rosettes or on prostrate to upright stems. Foliage color ranges from dark green to silvery green, sometimes with a prominent silver midrib

or wavy margin. Red or purple leaves are often present in spring, and sometimes persist along with the green leaves throughout the summer. Some species such as *Oenothera fruticosa*, *O. macrocarpa* and *O. pilosella* also feature attractive fall colors in shades of red, orange and purple. *Oenothera fruticosa* and *O. macrocarpa* have attractive reddish stems that contrast with the dark green summer leaves. Plant habits can be upright to decumbent, clump-forming to spreading, with taproots or fibrous roots.

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Sundrops and evening primroses thrive in full sun but tolerate light shade. Although most species prefer fertile, well-drained soils, *Oenothera speciosa* may spread rapidly to become weedy in rich or highly fertile soils. Plants spread less vigorously in dry, infertile soils. Sundrops and evening primroses are quite adaptable to droughty conditions once established, but are intolerant of poorly drained soils. Although few diseases or pests trouble *Oenothera*, root rot is a problem in wet soils, and flea beetles can disfigure foliage and stunt plant growth.

The various species of *Oenothera* are suited to a variety of landscapes, including perennial borders, rock gardens, meadows and wildflower gardens. Ozark sundrops (*O. macrocarpa*) is eye-catching at the



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Oenothera speciosa 'Siskiyou'

front of the border or in raised beds where its large fragrant flowers can be appreciated up close. In the summer border, hardy geraniums (*Geranium*), irises (*Iris*), catmints (*Nepeta*), phloxes (*Phlox*) and speedwells (*Veronica*) are good companions to common sundrops (*O. fruticosa*). Showy evening primrose (*O. speciosa*) may be too aggressive for perennial borders and is better suited as a ground cover. Whether used as focal points or en masse, sundrops and evening primroses shine in gardens, roadsides and native landscapes, where they provide an abundance of midsummer color.

The Evaluation Study

The Chicago Botanic Garden (USDA Hardiness Zone 5b, AHS Plant Heat-Zone 5) evaluated 19 species and cultivars of *Oenothera* from 1998 to 2003. The goal of the comparative trial was to recommend outstanding sundrops and evening primroses for Northern gardens through an assessment of their ornamental traits, disease and pest resistance, cultural

adaptability and winter hardiness. The evaluation group included taxa that were readily available at the outset of the project, and several additional seed-strain cultivars that were newly introduced during the evaluation period.

All plants were grown in side-by-side plots for easy comparison. The evaluation site received approximately 10 hours of full sun during the growing season and was openly exposed to wind in all directions. The well-drained, clay-loam soil was amended with composted leaves and had a pH of 7.4 throughout the evaluation term. Turf grass pathways surrounded the beds on all sides; 19 plots, each comprising eight plants, were separated within the beds by mulched strips.

Maintenance practices were kept to a minimum to simulate home garden culture. Water was provided as needed, and no fertilizer was applied. Lodged stems were not routinely cut back, but the denuded stems of *Oenothera fruticosa* cultivars were cut back to basal rosettes each year in late summer. In 1999, all

plants damaged by flea beetles were cut back to the ground in late August to rejuvenate plant health. Mulch consisting of shredded leaves and wood chips was placed around the plants for water conservation and weed suppression. No winter protection was provided.

Observations

Each *Oenothera* taxon was observed for ornamental traits, including floral display, foliage color, plant size and plant habit; cultural adaptability to the soil and environmental conditions of the test site; disease and pest problems; and winter injury. Sixteen of the 19 taxa lived for the full five-year evaluation term; conversely, three taxa died during the first growing season or the first winter and were not retested, including *Oenothera* 'Apricot Delight', *O.* 'Lemon Sunset' and *O. versicolor* 'Sunset Boulevard'. The final ratings were based on flower production, plant habit quality, overall plant health, and winter injury. Plant traits and evaluation specifics for the 16 taxa that completed the trial are shown in Table 1.

Table 1: Plant Characteristics and Performance Summary Ratings

Overall Rating	<i>Oenothera</i>	Flower Color	Flower Size	Bloom Period	Flower Coverage ¹	Summer/Autumn Foliage Color ²	Plant Height	Plant Width
★★★	'Cold Crick'	yellow	1½ in.	early Jun-early Jul	20-40%	deep green/orange	8 in.	16 in.
★★★★	'Sungold'	yellow	1½ in.	early Jun-early Aug	40-60%	green/red	16 in.	24 in.
★★★★	<i>acaulis</i> 'Aurea'	peachy yellow	3 in.	early Jun-early Jul ⁺	20-40%	green	8 in.	16 in.
★★★★	<i>fremontii</i> 'Lemon Silver'	pale yellow	3 in.	early Jun-early Jul ⁺	20-40%	silver-green	8 in.	24 in.
★★★★★	<i>fruticosa</i> 'Fyrverkeri' ('Fireworks')	yellow	2 in.	early Jun-early Jul	80-100%	green/burgundy	27 in.	30 in.
★★★	<i>fruticosa</i> 'Yellow River'	yellow	1½ in.	mid Jun-mid Jul	20-40%	green/red, purple	15 in.	24 in.
★★	<i>fruticosa</i> ssp. <i>glauca</i>	yellow	1½ in.	early Jun-early Jul	20-40%	green	20 in.	24 in.
★★★	<i>fruticosa</i> ssp. <i>glauca</i> 'Erica Robin'	yellow	1½ in.	early Jun-early Jul	20-40%	green and red/red	18 in.	25 in.
★★★★	<i>fruticosa</i> ssp. <i>glauca</i> 'Sonnenwende'	yellow	1½ in.	mid Jun-mid Jul	20-40%	green and red/red	10 in.	18 in.
★★★★	<i>macrocarpa</i>	lemon yellow	3½ in.	early Jun-early Jul ⁺	20-40%	green	12 in.	30 in.
★★★★	<i>macrocarpa</i> 'Silver Blade'	lemon yellow	3 in.	mid Jun-late Jul ⁺	20-40%	silvery gray	6 in.	20 in.
★★★★	<i>pilosella</i>	yellow	1½ in.	early Jun-early Jul	40-60%	green/red	12 in.	28 in.
★★★	<i>speciosa</i> 'Pink Petticoats'	pale pink, white eye	2½ in.	early Jun-mid Jul	20-40%	green and red	24 in.	36 in.
★★★★	<i>speciosa</i> 'Rosea'	pale pink, yellow eye	2½ in.	early Jun-early Jul	60-80%	green and red	17 in.	36 in.
★★★★★	<i>speciosa</i> 'Siskiyou'	pale pink, yellow eye	2 in.	late May-early Jul	80-100%	green and red	17 in.	36 in.
★★★★	<i>speciosa</i> 'Woodside White'	white	2½ in.	late May-early Jul	60-80%	green	18 in.	24 in.

Overall Ratings: ★★★★★ excellent, ★★★★ good, ★★★ fair, ★★ poor.

⁺Sporadic flowering in August and September extends bloom period beyond denoted dates.

¹Flower coverage ratings: <40% low; 40-60% moderate; >60% high.

²Summer foliage color precedes slash or is noted by single color designation only; autumn foliage color is noted after the slash.



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Oenothera macrocarpa

Flower production was an important criterion used to determine the final rating. While the majority of taxa had less than 40% coverage at peak bloom, exceptional floral displays were observed on *Oenothera fruticosa* 'Fyrverkeri' and *O. speciosa* 'Siskiyou'. In fact, 'Siskiyou' consistently had 100% flower coverage at peak bloom, displaying a carpet of pink blossoms for several weeks. Bloom periods were typically about four weeks long beginning in late spring through midsummer. Taxa with finite bloom periods and low flower coverage (less than 40%) typically received lower overall ratings. However, remontant or repeat flowering in August and September extended the bloom period and contributed to raising the final rating in cases where flower production was low. Repeat flowering was commonly observed on *O. acaulis* 'Aurea', *O. fremontii* 'Lemon Silver', *O. macrocarpa* and *O. macrocarpa* 'Silver Blade'.

Large, showy flowers are the most prominent ornamental trait of sundrops and evening primroses. The species in the trial were predominantly yellow-flowered, but *Oenothera speciosa* features pink or white flowers with contrasting eyes. In addition, some species feature brightly colored flower buds that add to the ornamental display; for example, *Oenothera fruticosa* 'Fyrverkeri' has orange-red buds; *O. fruticosa* ssp. *glauca* 'Erica Robin' and *O. pilosella* have orange buds; and *O. fruticosa* ssp. *glauca* 'Sonnenwende' has deep red buds. *Oenothera* bloom times are defined as diurnal (day-flowering),



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Oenothera fremontii 'Lemon Silver'

vespertine (opening at dusk) or nocturnal (night-blooming). All but one taxon in the trial bloomed during daylight despite *O. acaulis* and *O. fremontii* being listed as nocturnal species. The vespertine flowers of *O. 'Lemon Sunset'* opened in the early evening and were finished by the next morning.

Leaves were generally green or silvery-green during the summer, but some taxa featured a mixture of red and green leaves. A blend of burgundy, red and green leaves were common to *Oenothera fruticosa* 'Fyrverkeri' and *O. fruticosa* ssp. *glauca* 'Sonnenwende' in the summer. Most cultivars of *O. speciosa* had red and green summer foliage but no marked color change in the fall. Other sundrops, including the cultivars of *O. fruticosa*, had red, burgundy and orange autumn foliage (see Table 1). Unfortunately, the overall effect was lessened because the upright stems of *O. fruticosa* were usually denuded by late summer, leaving only basal rosettes for the remainder of the year.

Plant habits varied from upright to sprawling and clump-forming to rhizomatous. The stems of *Oenothera fruticosa* cultivars were typically upright throughout the summer, but 'Yellow River' and 'Erica Robin' often had floppy stems by midsummer. In addition, the stems of *O. fruticosa* cultivars were typically denuded of leaves by September, and the bare stems were pruned back to basal rosettes. The crowns of clump-forming *O. macrocarpa* tended to open up after flowering but filled in again within a few weeks. *Oenothera speciosa*, *O. fruticosa* and

O. acaulis 'Aurea' spread by rhizomes at varying rates to form colonies. All cultivars of *O. speciosa* have fast-spreading habits, but 'Pink Petticoats' was by far the most vigorous in the trial. In its first year, the eight plants in the plot filled in and spread approximately 24 inches outside the plot perimeter. By the second season the plot had doubled in size, engulfing adjacent evaluation plots and spreading widely into the surrounding turf grass. *Oenothera fruticosa* and *O. acaulis* 'Aurea' spread more slowly, forming colonies of rosettes after several years.

The majority of sundrops and evening primroses were healthy throughout the evaluation term and were determined to be adaptable to the cultural conditions of the test site. Plant health occasionally declined on some taxa following flowering, but plants usually rejuvenated by the end of summer without any additional care or cutting stems back. The loss of stem leaves on *Oenothera fruticosa* in late summer did not correspond to any obvious cultural or environmental conditions, and was concluded to be the natural habit of this species to drop leaves as overwintering rosettes are formed. The health of *Oenothera fruticosa* ssp. *glauca* declined over multiple years, and eventually all plants died in the winter of 2001-2002. The health of *O. versicolor* 'Sunset Boulevard' declined steadily after planting in May 2000, and all plants were dead by September.

The *Oenothera* species were generally pest-free during the trial period, but an infestation of flea beetles seriously affected the health of all test plants in 1999. Both the adult beetle and larvae were observed feeding on flowers and leaves at various times in the summer and fall. The adults were first observed in mid-June feeding on flower petals of *O. speciosa* cultivars and *O. pilosella*, which was planted in an adjacent plot. Minor damage was noted before the tiny black beetles disappeared from the trial plots. By mid-August larvae were observed feeding on leaves throughout the trial plots, causing the foliage to have a tattered appearance.



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Oenothera speciosa 'Rosea'

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Oenothera pilosella

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Oenothera fruticosa 'Fireworks'

Subsequently, severe foliar desiccation occurred, resulting in 75% to 100% defoliation on all *Oenothera* taxa by the time the larvae finished feeding at the end of August. All plants were cut back to the ground at this time, and healthy foliage regenerated by mid-October. The adult beetles were once again observed feeding only on *O. speciosa* cultivars in mid-October. Although the damage was significantly detrimental to the health and ornamental display of the affected plants, the damage was limited to just one of the five evaluation years. Without multiple infestations to observe and compare, flea beetle damage was not factored into the final rating.

Winter injury was noted in multiple years of the trial, but no consistent patterns of injury were observed. During the first winter of the trial in 1998-1999, plant losses were recorded for *Oenothera fremontii* 'Lemon Silver' (1 plant dead) and *O. fruticosa* 'Fyrverkeri' (1 plant dead), and minor crown damage was noted on several plants of *O. pilosella*. Waterlogged soil in the winter of 2001-2002 was likely the cause of injury or death for many of the plants, including *O.* 'Cold Crick' (6 plants dead), *O. fremontii* 'Lemon Silver' (1 plant dead), *O. fruticosa* ssp. *glauca* (all plants dead),

O. fruticosa ssp. *glauca* 'Erica Robin' (3 plants dead), *O. fruticosa* ssp. *glauca* 'Sonnenwende' (1 plant dead) and *O. pilosella* (1 plant dead). Crown injury was observed in one or more winters within the plots of *O. speciosa* 'Pink Petticoats' (2001-2002), *O. speciosa* 'Rosea' (1999-2000) and *O. speciosa* 'Woodside White' (1999-2000 and 2000-2001). In each case, stems regenerated quickly to fill the plots in completely. *Oenothera* 'Apricot Delight' and *O.* 'Lemon Sunset' lived for only one growing season and were killed during the winter of 2000-2001. No hardiness assessment was made, since neither taxon was retested.

Summary

More than half of the sundrops and evening primroses under evaluation finished the trial with a good or excellent rating. The heavy-flowering *Oenothera speciosa* 'Siskiyou' and *O. fruticosa* 'Fyrverkeri' had the most impressive floral displays each year. In both cases, floriferousness combined with healthy plants and winter hardiness to give these taxa five-star excellent ratings. Lower flower production did not necessarily prevent a taxon from getting a high overall rating, especially when a repeat

bloom period occurred later in the season. *Oenothera acaulis* 'Aurea', *O. fremontii* 'Lemon Silver', *O. macrocarpa* and *O. macrocarpa* 'Silver Blade' all had extended bloom periods in August and September as well as healthy, robust plants. Unfortunately, a combination of low flower production, inferior plant habits, poor health and/or winter injury contributed to the lower ratings for *O. speciosa* 'Pink Petticoats', *O. fruticosa* ssp. *glauca* 'Erica Robin', *O. fruticosa* 'Yellow River' and *O. fruticosa* ssp. *glauca*. All in all, there are a variety of sundrops and evening primroses that are highly recommended for Northern gardens.

References

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