

Superior Annuals For Northern Climates

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I. Introduction:

In this article, Mark and I identify traditional, non-traditional, new and interesting annuals that performed well throughout Minnesota during the last 2 years.

Minnesota is unique in that Minneapolis/St. Paul is second only to Fargo in annual temperature extremes. We can get up to 104°F and down to -32°F. Other locations in Minnesota can be more extreme (last winter Tower, Minnesota got down to -77°F!). Summer conditions in Minneapolis/St. Paul are typically characterized by 82-85°F day and 55-62°F night temperatures. In other words, we can have temperature extremes but, in general, our summer temperatures are cooler than most of the United States.

A variety of new plant materials were introduced over the last 5 years. Consumers are demanding more variety in plant species. European and Japanese seed companies are taking a more active role in the American bedding plant industry. Commercial companies are producing new cultivars more quickly. It is difficult to keep up with what has good performance in consumer's yards and what does not! Hopefully, this article will be of use to

you in selecting materials to grow next year if you live in the northern U.S.

II. Non-Traditional Annuals

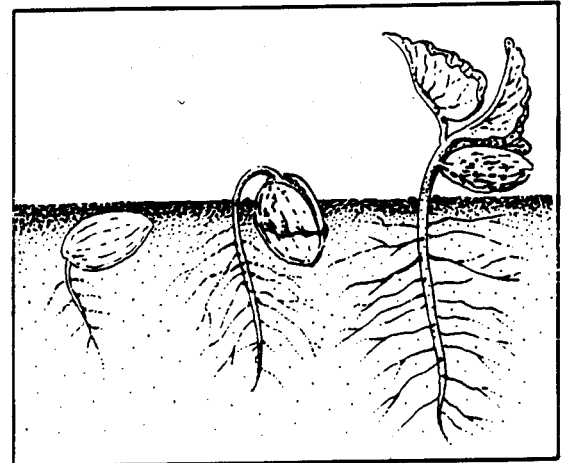
Common Name: Gomphrena,
Globe Amaranth

Latin Name: *Gomphrena
globosa*

Family: *Amaranthaceae*

Gomphrena globosa is native to India.

Gomphrena is a sturdy, well branched plant that reaches a height of 6 (new dwarfs from Sakata) to 30 inches (older varieties). Plants bear 'clover-like' blossoms 1/2-1" in diameter that are composed primarily of a tightly packed sphere of bracts.



The actual flower is deep in the inflorescence and are rarely visible. Bract colors include white, orange, pink, purple and magenta. Flowering

ately move seedlings to a lighted area.

"Gomphrena is consistently one of the best performers in our trial gardens."

Crop production time is 8-10 weeks depending on the cultivar.

Gomphrena is a warm temperature loving plant. Therefore, plants should be grown at temperatures between 65-75°F in the greenhouse. B-Nine (2,500-3,000 ppm) is effective for height control and is necessary on all cultivars I have come across with the exception of the Gnome Series. DIF is moderately effective. Feed regularly with 50-100 ppm N-P-K in the irrigation water.

stems are cut for drying. Gomphrena are excellent plants for full sun locations that are hot.

Gomphrena are now noteworthy because of recent breeding efforts. Breeding efforts have greatly reduced height, increased uniformity and increased the variety of colors available. The Gnome Series introduced by Sakata Seed Inc. offers a wide variety of colored plants excellent for border or edge plants (<6" tall). In addition, American Takii's Rose Bicolor performed terrifically in our evaluation gardens. Stay away from the orange colored varieties as they tend to become leggy and are weak stemmed.

Gomphrena seed germination requires darkness, 70-75°F, and requires 7-10 days. Once seed germinates, immedi-

Common Name: Celosia,
Cockscomb

Latin Name: *Celosia argentea*
var. plumosa

Family: *Amaranthaceae*



Celosia are native to warm areas of US and Africa. Plants are grown for their showy inflorescences that are composed of hundreds of flowers. Flower colors include red, pink, yellow, and magenta. The cultivar discussed here is pink. Plant height is approximately 14-18".

'Pink Castle' Celosia is a new introduction that can be grown as a background plant in a flower bed and/or for dried/fresh cut flowers. Celosia

are often poor branching, however, Pink Castle is freely branching producing a 'full' flower bed when plants are spaced 8-12" apart. Inflorescences are smaller than most Celosia but more numerous.

Celosia seed are dark/light requiring. Sow seed on soilless medium surface and cover lightly with vermiculite. Germinate seed at 70-75°F media temperature. Germination should occur after 6-10 day. Celosia is a warm temperature loving bedding plant. Therefore, the crop should be grown at temperatures between 65-70°F. Production time is 56-70 days.

Do not water stress celosia as this can cause premature flower initiation. B-Nine (2,500 ppm) is effective as a growth retardant and is necessary. DIF is moderately effective for height control. Feed regularly with 50-100 ppm N-P-K in the irrigation water.

Common Name: Cleome,
Spider Flower

Latin Name: *Cleome*
hasslerana, *C. spinosa*

Family: *Capparidaceae*

Cleome is native to the Caribbean. Cleome is the only plant in the caper family grown as a commercial flower-

ing annual. Plants can have woody stems that reach 4' in height. Foliage is decorative palmately divided leaves. Flower are born terminally with clusters of white, pink, purple, or rose

flowers from late June to frost.

The stamens are 3" long giving the inflorescence an 'airy' appearance.

Cleome are available in mixed colors or white only. Recommended cultivars include 'Queen Mixed Colors', 'Helen Campbell' (white), and

'Rose Queen' (pink). These plants make excellent center plants in round flower beds or background plants. Consumers should be encouraged to pinch plants in May once to encourage branching. Plants should be



"Cleome require heavier feeding to perform well in the greenhouse and in a consumer's yard."

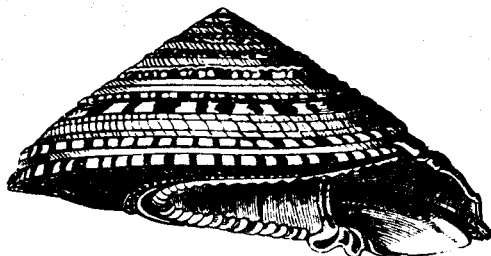
spaced 12" apart in a mass planting. A slow release fertilizer should be broadcast around the base of cleome since they are heavy feeders.

Cleome seed germination is light

aided. Therefore, sow seed on a soilless medium and sprinkle vermiculite lightly over the top. Place sown seed in a glasshouse or lighted growth chamber under high humidity conditions and 72-75°F media temperature. Germination should occur within 7-14 days.

Cleome is a warm temperature loving bedding plant, therefore, the crop should be grown at 65-70°F. Crop production time is 68-90 days and the crop is sold 'green' (without flowers). B-Nine (2,500 ppm) is effective and is always necessary. DIF is moderately effective.

Cleome are commonly underfed in commercial production resulting in small leaves and premature flowering with small inflorescences. Therefore, feed plants with 100 ppm N-P-K continuously in the irrigation water. Remember that this plant will tend to grow tall fast, so apply growth retardant as needed in production and during sales (follow the label for reentry with B-Nine!).



Common Name: Statice, Sea Lavender, Sea Pink

Latin Name: *Limonium bouduellii and sinuatum*

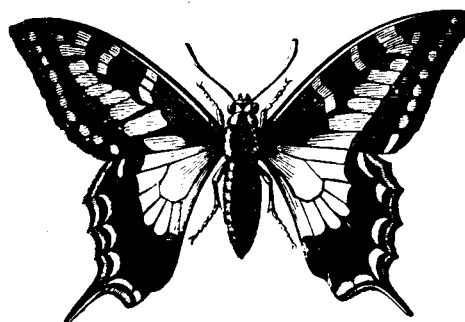
Family:
Plumbaginaceae

Commercial bedding plant statice originate from Algeria and Mediterranean regions. Plants are composed of a rosette of divided leaves that 'hug' the ground and stiff, 1-2" tall-stemmed inflorescences that emerge from the center. Flowers are held horizontally on the inflorescences. Flower

color is bright and blue, pink, yellow, white or pink in color. Inflorescences are long-lived and can be cut and dried.

Recent breeding efforts have improved statice considerably. Height is reduced, stem strength is increased, time to flower is reduced and flower color variety is increased compared to older varieties. New cultivars that are particularly noteworthy include Takii's 'Friendly Yellow', and Sakata's 'Excellent Mixed'.

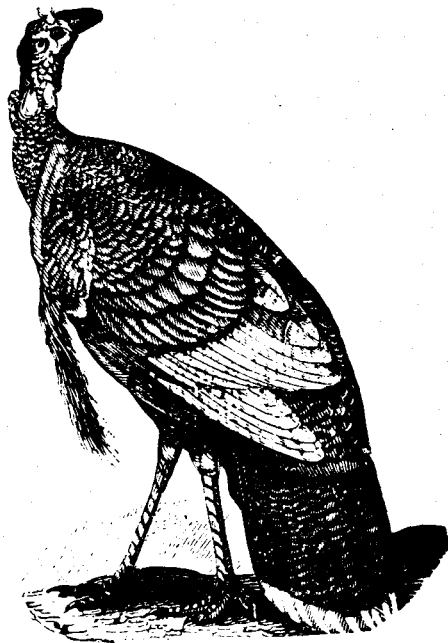
Plant statice in sandy soil approximately 6-8" apart as statice can develop root rot easily when grown wet.



Statice seed germination is light requiring, therefore, sow seed on the media surface and cover lightly with vermiculite. Place sown seed in a glasshouse or lighted growth chamber under high humidity conditions and 72-75°F media temperature. Germination should occur within 7-14 days. Grown plants with 60-70°F air temperatures. Crop production time is 68-90 days and the crop is sold 'green' (without flowers) or in flower (new cultivars).

B-Nine (2,500 ppm) is effective and is sometimes necessary if plants will be sold in flower. DIF is moderately effective.

Statice are not high feed requiring annuals. Therefore, feed plants with 50-100 ppm N-P-K during production. Additional fertilizer is usually not necessary in flower beds with older cultivars. Newer cultivars benefit from slow release fertilizer application as they are considerably more floriferous.



Common Name: Flowering Tobacco, Nicotiana
Latin Name: *Nicotiana glauca*,
N. affinis
Family: *Solanaceae*

Flowering tobacco is native to South America and is named after Jean Nicot who introduced the tobacco plant to France in the 16th century. Nicotiana initially develops a rosette of larger green hairy leaves. A central stalk typically develops with side branches from with nearly horizontal flowers. Flower color includes white, pink, red.

The original species of flowering tobacco are 2-3' in height with white flowers. They are definitely under used. I noticed that the species *glauca* was used in flower beds throughout Montreal on a recent trip as a background annual.

Nicotiana love heat and full sun and can tolerate dry soil. Never plant them in shade as flowering stalks tend to weaken and fall over. New cultivars are considerably shorter (6-12") and vary in color from the original species (white).

Nicotiana seed germination requires light. Seed is very fine so no covering is usually

necessary. Germinate at media temperatures of 72-75°F. Seed germination requires 14 days. Crop production usually requires 70-75 days when plants are grown at 67-72°F. New short cultivars are sold in flower. Original species are sold green.

B-Nine (2,500 ppm) is effective and is necessary. DIF is moderately effective. Nicotiana are not high feed requiring annuals. Therefore, feed plants with 50-100 ppm N-P-K during production.

III. Interesting Annuals

Common Name: Datura

Latin Name: *Datura arborea*, *D. metel*, *D. sanguinea*, *D. suaveolens*

Family: *Solanaceae*

Datura are native to China or South America. The plant typically grows low to the ground and branches freely. Flowers are usually at least 4" and can

nated. Datura contains an alkaloid, hyoscyamine, that is both a hallucinogenic and toxic drug. Therefore, Datura should not be planted where children or pets will not be present.

Datura are striking plants that offer interest in the garden. Flowers are large and almost 'Easter-lily-like' in appearance. The fragrance is a bonus. Datura are best suited for planting in large patio containers and not flower beds (although I just saw a terrific planting of Datura in a flower bed in downtown Montreal)! Seed is easily harvested each year from seed pods. Plants should be planted outdoors individually or in mass plantings 2' apart.

Sow Datura seed 1/8" deep in a soil-less media maintained at 72-75°F. Seed germination usually occurs in 14 days. Datura is a warm temperature loving plant and related to the tomato. I suspect that 65-70°F growing temperatures would be best.

B-Nine (2,500 ppm) can be used for height control which is usually necessary. Plants should be sold in 4-6" pots as a specialty plant and not in a bedding plant pack. Crop time should require 56-70 days. Do not overfertilize as Datura flowering decreases as fertility level increases.

"Datura are perfect for hot areas where adults are present in the evening to enjoy its unusual flowers."

be as large as 10" in diameter. Flowers are white, yellow, purple, red, or pink in color. Flowers are fragrant and open in the late afternoon and bloom all night because they are moth polli-

Common Name: Lavatera, Rose Mallow

Latin Name: *Lavatera trimestris*

Family: *Malvaceae*

Lavatera are native to Portugal and the Mediterranean. Lavatera is a self-supporting 2-4' high shrub that bears

2-3" diameter hibiscus-like flowers from early July to mid-end of August. Plants often stop flowering during September if plants are allowed to set seed! The flowers can often completely cover the plant. Flower colors include deep rose, pink and white. This was by far one of the most popular plants in the trial garden (along with 'Indian Summer' Rudbeckia). Seed can be sown at different times outdoors to have continuous flowering. Plants can be cut back after flowering to promote reflowering.

New lavatera cultivars are shorter in height and are more floriferous than older scultivars. Cultivars we recommend include 'Mont Blanc' (white) and 'Silver Cup' (pink).

Plant plants 8-15" apart in the full sun. We planted 'Silver Cup' plants in the worst soil of our trial garden (wet and pH >8.0) and the plants did terrific! Sow seed directly in soil every 3-4 weeks for continuous flowering after the initial planting.

I could not find data on light or dark requirements for germination. Sow seed 1/8" deep in a soilless medium maintained at 72-75°F. Lavatera prefer cooler climates, therefore, greenhouse temperatures should be maintained from 60-67°F. Flowering occurs 10-12 weeks after sowing.

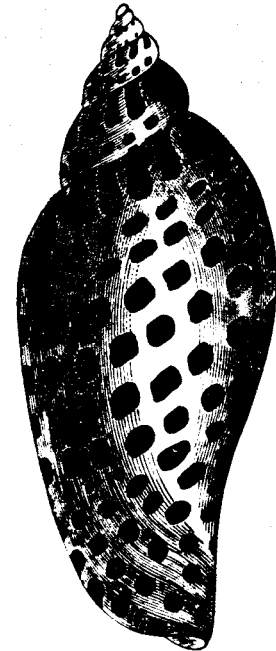
Lavatera are relatively heavy feeders, therefore, feed with 100 ppm N-P-K with each watering to encourage full growth. Pinching may be necessary to promote branching. We found B-Nine (2,500 ppm) to be effective in controlling stem elongation.

Common Name: Echium,
Viper's Bugloss
Latin Name: *Echium*
plantagineum var.
excelsum
Family: *Boraginaceae*

Echium is native to Eurasia. This plant is a small spreading annual herb with flowers that change from pink to blue in color as they age. Flowers are born on the top of the plant continuously from July 1 till frost. Leaves are small and dark and alternately arranged on the stem.

Echium is rather slow to get established but grows rapidly in dry, sandy soils. Plants grow together easily forming a mound about 18-24" tall when planted 8-12" apart making it an excellent plant for a border. This plant is excellent for hot dry areas. The only drawback is that bees seem to love it.

Sow seed on surface of soilless media and cover lightly with vermiculite. Maintain media at 72-75°F. Apparently the recommended pH is 6.5-7.0, however, Echium grew well for us in soil with a pH of 7.5-8.0. Flowering occurs 12-14 weeks after sowing, however, plants should be grown in their final location at least 4 weeks prior to flowering.



Common Name: Hyacinth Bean
Latin Name: *Dolichos lablab*
Family: *Leguminosae*

Hyacinth bean is native to Egypt. It is a vine growing to 30 feet in length but

Soak seed overnight prior to sowing. Since seed do not transplant well, sow seed in containers no more than 6-8 weeks prior to the planting date. Sow seed with the 'eye' facing down. Seed germinate in 7-14 days.

Hyacinth bean is a warm temperature loving plant, therefore, grow seedlings at 65-75°F. Since Legumes create their own nitrogen, little additional fertilizer is needed. Therefore, fertilize young seedlings with 50 ppm N-P-K with each irrigation.

"Dolichos is an excellent vine for hot locations! It will flower profusely with purple fragrant flowers all summer. An early start is the most important part of success with this vine."

Common Name: Sweet Potato
 cv 'Blacky'

Latin Name: *Ipomoea batatas*
Family: *Convolvulaceae*

usually only reaches 15 feet. All parts of the vine are edible. It is a desirable annual vine because of its large (3-6") dark green/bronze foliage and fragrant purple flowers arranged in a wisteria-like inflorescence. Dave Linder said plants he was growing onlt started flowering at the end of August. Plants flower freely from July to frost when started early-plant as early as possible. Larger plants in 1/2 gallon pots may be the way to sell these plants

This is perhaps one of the most under used vines I know of. It is vigorous, loves heat, and blooms prolificly when planted early. I have seen it used in the Montreal Botanical Gardens and at the Michigan State University trial gardens with great success. At Michigan State this vine literally covered a large gazebo! Make sure you try some. Final planting distance should be no less than 1' apart.

I was first introduced to this plant at a talk given by Allen Armitage. I later saw this cultivar of sweet potato at the Montreal Botanical Garden. It is noteworthy.

What makes 'Blacky' unique is its dark bronze/black foliage. Sweet potato is naturally a vine that does not climb. Therefore, this plant should be used in locations where you want vining foliage to cascade over a wall or container. Sweet potato can often be grown in drier locations because of its deep rooting (>48").

Propagate this crop by planting the sweet potato itself. Growth is rapid, so don't plant any earlier that 4 weeks prior to the time plants are to be moved outside.

IV. Traditional Bedding Plants

Common Name: Pansy

Latin name: *Viola x wittrockiana*

Family: Violaceae

Pansy is a complex hybrid of *Viola altaica*, *V. tricolor*, and *V. lutea*. The parent species are native to Europe, Asia Minor and Asia. Pansy is a compact, rosette type plant that produces large flowers held well above the foliage. Pansy have been used as a flowering annual bedding plant since 1830. The large number of commercial cultivars are mainly distinguished by flower color and markings, and by winter hardiness. The vast range of flower colors include shades of white, yellow, red, purple, blue, and black often with contrasting eyes, striped, edged, or masked. Pansies are plants that are very hardy and make excellent early spring flowering annuals in the North and winter bedding plants in the South.

The resurgence of interest in pansies by consumers is the result of recent breeding efforts. New pansy cultivars better tolerate warm temperatures and flower throughout the spring and summer in Northern climates. Several cultivars now overwinter quite well in Minnesota. Single color flowers (without blotches or eyes) provide a new look to an old favorite. Pansies from S & G, Benary, Sakata, and Goldsmith Seeds have performed well in trials in Minnesota, flowering from April through September in full sun. Outstanding performers include 'Maxim Orange', 'Crystal Bowl

'Purple', (Sakata), 'Padparadja' (Benary), 'Accord Yellow Blotch' and 'Universal Plus Clear White' (Goldsmith).

Pansy seed should be germinated in the dark at 63 - 68° F and will germinate in 7 to 10 days. After germination, immediately move seeds to lighted area. Production time is 10 to 12 weeks depending on cultivar.

Pansies are cool season plants and should be grown on a 55 to 60° F. Feed at 50 to 75 ppm N-P-K under CLF. Bonzi (15-30 ppm) is effective for height control and DIF is moderately effective.

Common Name: Salvia or Mealy Sage
Latin name: *Salvia farinacea*
Family: Labiatae

Mealy sage is native to Texas and Mexico and is grown as a perennial in southern climates and as an annual in northern climates where it is marginally hardy. Mealy sage is a sturdy, well branched perennial with sage-like foliage and blue or white flowers borne on plants 18 to 24 inches tall. The flower spikes are held nicely above the foliage providing a excel-



lent show from July through October. Flowers are excellent for drying and plants are relatively free of pest and disease in the garden setting. Plants are excellent for hot and dry locations in full sun.

Salvia farinacea has become more popular due to recent improvements by plant breeders. Plants are now more compact, well branched, with larger flower spikes and a longer blooming period. New bicolor florets with a blue corolla and white calyx add a new look to the normally blue or white flower spike. Benary's 'Reference' is an excellent bicolor salvia that does well in hot, dry locations and offers a long blooming period from early July to October in Minnesota. 'Victoria' (blue flowers) and 'Argent' (white) have been consistent strong performers under varying conditions from the hot, dry summers in Morris, Minnesota to the short, cool summers of Grand Rapids, Minnesota. The All-America Selection, 'Strata' also deserves a close look and offers a stunning display of blue and white florets on a large spike.

Salvia farinacea seeds require light for germination and media tempera-

ture between 75 - 78° F. Seeds will germinate in 12 to 25 days and should be moved to a lighted area after germination. Grow plants on a 60° F for best quality. B-Nine (2,500 ppm) is effective for height control and plants should be fertilized and 75 - 100 ppm N-P-K under CLF. Plants are ready for sale in 8 - 10 weeks.

Common Name: Sweet

Alyssum

Latin name: *Lobularia maritima*

Family: Cruciferae

Sweet alyssum is native to mild maritime climate of southern Europe. Sweet alyssum is a very compact plant with an abundance of small flowers that range in color from pure white through pink to deep violets. When in full bloom the numerous small flowers form an attractive carpet of flowers. Sweet alyssum is an excellent border plant, edging.

New cultivars offer more intense flower colors and better performance in warm locations than previous cultivars of this cool weather plant. New cultivars fill in faster with greater floral density making a more attractive border. We have found that 'Wonderland White' and 'Wonderland Purple' have superior performance in our full sun locations. Plant growth, floral density, and color intensity was consistent even during the July and August heat.

Alyssum requires light and 70° F for optimum germination. Germination occurs within 8 days of seeding and multiple seeding per plug or direct seeded to packs. Plants should be grown at 55 - 65° F and production

"Blue salvia are now more heat tolerant and compact. They make an excellent background plants."

ture between 75 - 78° F. Seeds will germinate in 12 to 25 days and should

time is 6 - 8 weeks. Fertilize at 50-75 ppm N-P-K using CLF. Height control is usually not required for this crop; B-Nine is effective when applied at a rate of 2,500 ppm.

Common

Name:

Ageratum

Latin name:

*Ageratum
houstonianum*

Family:

Compositae

Ageratum is a foster tender plant grown for its brush-like fluffy blooms that are produced prolificly throughout the summer. Ageratum is native to Central America.

The many hybrids and cultivars of ageratum are well suited to a number of garden uses depending on plant size and habit. The compact dwarf types (8 - 10") are well suited for use as border plants in annual beds and in planters. The taller varieties (24 - 26") have been used as cut flowers and are now being used as tall annual bedding plants.

Flower color ranges from white through blue, lavender and pink. Ageratum is well suited for full sun locations and will tolerate hot, dry locations.

Ageratum cultivars are consistently strong performers in our trials. Pro-



ducing large masses of flowers throughout the summer. Neptune Blue and White (Goldsmith) and the Hawaii series have been particularly outstanding cultivars. The Hawaii series are very floriferous and keep a very neat

growth habit even under very hot (>90° F) conditions. The large and abundant flowers of the Neptune cultivars keep a favorite of display garden visitors year after year.

Ageratum seeds require light and temperatures between 70 - 75° F for optimum germination. Plants should be grown-on at 65 - 70° F and production time is 10 -

12 weeks. Fertilize with 50 ppm N-P-K CLF. B-Nine (2500 ppm) is effective for height control and plants are very responsive to DIF.

Common Name: Impatiens

Latin name: *Impatiens
walleriana*

Family: *Balsaminaceae*

Impatiens are found in the mountain woodlands of Tanzania and Mozambique. These free flowering, succulent plants prefer cool, shady locations. Prolific flowering, and a wide range of flower colors and color patterns combined with ease of culture

have made this one of the most popular bedding plants today.

Plant breeders have had some success in developing cultivars that will tolerate warm and higher light conditions but

Impatiens still perform best in shade to partial shade.

"New multiflora petunias have stimulated renewed interest in this traditional bedding plant."

Plants are moderately responsive to DIF and height can be reliably controlled with Bonzi (60 ppm). Cultivars differ in response to B-Nine. Plants should be put on a CLF program of 75-100 ppm N-P-K.

Common Name:
Petunia

Our trial gardens provide an excellent environment to assess the performance of impatiens in full sun. We have found that Accent Rose and Salmon (Goldsmith) perform well in full sun if provided sufficient water to avoid drought stress. Accent Rose and Salmon flowered continuously in full sun despite temperature in the upper 90's for several weeks this summer. These cultivars perform even better in partial shade.

Other strong performers in partial shade include Accent Violet, Accent Deep Pink (Goldsmith), Tempo Burgundy (Bodger), and Impulse Carmine (S & G). These cultivars provided continual flowering, a neat growth habit, and sharp clean flower colors throughout the summer.

Impatiens require light and 72-75° F for optimum germination. Seeds germinate in 15 - 18 days and should be moved to lighted area immediately following germination.

Plants should be grown on at 65 - 70° F and should be ready for sale 8 - 10 weeks after sowing.

Latin name: *Petunia x hybrida*
Family: *Solanaceae*

Petunias were derived from hybrids of *P. axillaris* x *P. integrifolia*. There large, fluted, funnel-shape flowers provide reliable summer color in hot, dry, sunny locations. Petunias come in a wide spectrum of colors, bicolors, picotees with added variation in flower shape from singles to doubles to frilled edges.

Petunias are best suited for dry, sunny locations but recent selections show improved performance in windy, rainy conditions. Plant breeders have been able to add two new types to the already diverse petunia family and these offer novel and interesting alternatives to the grandiflora, floribunda, and multiflora types. Purple Wave and the Fantasy (millifera) types have provided a refreshing change of pace in petunias. Although these new types promise to carve out a significant niche in the annual bedding plant market. The grandifloras and multiflora still offer a consistently strong choice for dry, sunny locations. Celebrity Chiffon Morn (Bodger),

Primetime Burgundy, Primetime Salmon (Goldsmith), Pink Centre Flash (S & G) have stood out from the others in our trials offering a strong show of color throughout the season and showing greatly improved performance in standing up to windy, rainy conditions.

Purple Wave has been outstanding in every type of situation from hanging baskets and planters to a annual beds. Its prolific flowering and abundance of growth are eye catching in any situation. Plants are easy to grow and maintain and hold up well in any weather. All this new type needs is a broader range of colors.

The new millifera type petunias, Fantasy Series (Goldsmith), are an excellent alternative to the more traditional petunias. The perform well in packs and due to their compact habit can be kept looking good in pack much longer than other types of petunia. In the garden all but Fantasy Blue has performed quite well and do extremely well in windy, rainy weather.

The colors are superb very crisp and clean and the low growing habit

make in a nice border as well as bedding plant. Fantasy Pink Morn and Fantasy Crystal Red are the top performers in this class.

Petunia requires light and 70 - 75° F

for optimum germination. Seeds germinate in 10 -12 days. Grow plants on at 60 -65° F for a production time of 8 - 10 weeks. Fertilize with 100 - 150 ppm N-P-K under CLF. B-Nine (2500 - 5000 ppm) will effectively control plant height. Purple Wave has similar cultural requirements as above but due to its rapid growth rate will require more frequent growth regulator applications to keep internodes short. The millifera petunias can also be grown using the cultural practices suitable for standard petunia types. Millifera petunias do not require any height control measures due to their compact growth habit.

V. New Bedding Plant Species

Common Name: Black Eyed Susan

Latin name: *Rudbeckia hirta*

Family: Compositae

Native to the Central US in is not

"Definitely try 'Indian Summer' Rudbeckia. It has been one of the top performers for us the last 2 years. People love it. Flowering is nonstop the whole summer."

surprising to find that this species does well in the upper Midwest

and throughout the northern US. The large yellow daisy flowers brighten up any garden bed. Plants tolerate a wide variety of soil types and require full sun for optimum growth. Plant height ranges from 2 to 3.5 feet and these

bushy plants are often 2 to 3 feet wide. Plants begin to bloom in late June and bloom all season long.

"Nierembergia starts slow but is a tuff new plant that is an outstanding plant for full sun locations. Start some plants early so customers can see what the flowers look like."

Several new cultivars have been release in the last five years and all have improved plant growth habit and flowering. Without a doubt, the top new cultivar in our trials has been Indian Summer with blooms consistently over 8" in diameter and a vibrant yellow color. This cultivar is sure to be a focal point in any garden. Blooms are held well above the foliage and plants tolerate a variety of conditions without fail. There is some variability in plant size due to genetic variability inherent in any open pollinated cultivar. Toto (Benary) offers a dwarf Rudbeckia that is a novelty for the garden. Plants are 8 - 10" tall with flower size in proportion to the plant size. This plants do well in 4.5" pots and in the garden.

Black Eyed Susan requires light and 70-75° F for optimum germination. Seeds germinate in 14 -21 days. Grown on plants at 60 -65° F Production time is 7 - 9 weeks and time to first flower is 10 -14 weeks after sowing seed.

B-Nine (3,000 ppm) is effective for height control and response to DIF is not known. Fertilize using a CLF program of 75-100 ppm N-P-K. Supplemental lighting is beneficial to plant quality and may reduce production time.

Common Name: Nierembergia
Latin name: *Nierembergia* spp.
Family: *Solanaceae*

Nierembergia, a South American native, was named after the Spanish naturalist, Juan Eusebius Nieremberg. In the wild, this plant is found growing in moist, sunny locations in temperate South America.

Nierembergia has dark green, spreading foliage and upturned bell-like flowers that last from early summer well into autumn. Flower colors range from white through pale blue to purple. The plant has a spreading growth habit (12- 15") similar to sweet alyssum with a plant height of 5 - 6" .

'Mont Blanc' (Takii) is the first white flowering Nierembergia to be grown from seed. It is very heat tolerant and has been outstanding in full, sun in the display garden in Saint Paul, MN. It produces a dense carpet of pure white flowers and blooms from early June until frost. This plant does well under dry conditions without any significant reduction in flowering during dry periods. This rugged, and durable annual is an excellent border plant that will provide flowers all summer long.

Nierembergia seed should be covered lightly and germinated at 70-75° F Seeds germinate in 7 -10 days . Plants

grow slowly when small but grow more rapidly after transplanting. Grown plants on at 70-80° F day and 60-65° F night with supplemental

"Melampodium is one of the best new plants we have seen in years. This plant is excellent for hot, sunny areas where a mass planting and/or background plant is needed."

lighting to promote earlier flowering.

Mont Blanc requires long days to initiate flowering and plants begin flowering 70-75 days after start of long days.

Height control is usually not necessary but plants should be responsive to B-Nine as they require growing conditions similar to petunias. Fertilize with 50 -75 ppm N-P-K under CLF.

Common Name: Viola

Latin name: *Viola* spp.

Family: *Violaceae*

Violas are hybrids of E. European violet species (*V. altaica* and *V. lutea*). These plants are very compact on 4 - 5" tall with many 1" flowers. Most cultivars prefer cool temperatures and perform well in partial shade in warm climates or full sun in cool climates. Flowers and plants are similar to pansy. Flower colors range from white to yellow through blue to deep purple often with a face or stripes of a

different colors.

As with pansies, Violas are being selected for heat tolerance. New cultivars produce many flowers even under high temperatures. The Jewel Series (Takii) has been outstanding performers in our trials in Minnesota. The Jewel series is the first F1 hybrid Viola and has produced an abundance of flowers from spring through fall. This series has done particularly well during the current season and has continued to flower despite 8 consecutive days over 90° F in July and several more 90°+ days since then. The flower colors are intense and clean and the plants remain compact. The small dainty flowers offer an elegant addition to the garden and are well suited for rock gardens and other small plantings. Alpine Summer (S & G) has also been a good performer and is certainly worth a look but has not flowered as prolifically as the Jewel series.

Violas require dark and 63-68° F for optimum germination. Seeds germinate in 7 to 10 days. Violas are cool season plants and should be grown on a 55 to 60° F Feed at 50 ppm N-P-K under CLF. Production time is 7-8 weeks. Height control is not necessary but can be achieved with Bonzi (2-5 ppm).

Common Name: Melampodium

Latin name: *Melampodium paludosum*

Family: *Compositae*

Melampodium is native to South Africa. Plants are sturdy, drought and heat tolerant and perform well in

nutritionally poor soils. Yellow daisy flowers are produced on plants 8 - 36" tall. Plants perform well in full sun to partial shade. Perennial in hot climates, plants form a very deep tap root and are propagated by seed.

Melampodium has been selected for more compact growth habit and larger flower size. Two new cultivars 'Derby' (Benary) and Medallion (S & G) have been particularly outstanding. Derby is a very compact plant (8" tall) with small leaves a flowers slightly larger than Medallion and Showstar. This cultivar has been flowering profusely since June 1 and has maintained in compact growth habit. Medallion is a larger plant (24" tall and 18" spread) which has flowered profusely throughout the season. Both cultivars have bright yellow flowers and have done well in full sun and partial shade. These cultivars offer excellent choices depending of desired use in the garden. The compact Derby is excellent for borders and small planters. Medallion is well suited as a tall bedding plant or for use in larger planters.

Melampodium requires light and 65 - 68° F for optimum germination. Seeds germinate in 7 -14 days. Plugs benefit from 50 ppm N fertilizer once per week. Transplant 4 -5 weeks after sowing and grow on at 60 -65° F Green packs require 6 -7 weeks and flowering pack require 8 -9 weeks to produce. Apply 100 ppm N-P-K once per week to keep nitrogen levels low. Growth regulators are not needed for Derby but Medallion may require B-Nine (2500 -3000 ppm) to control height.

