

Colorado State University 2020-2021 Cool Season Trial Performance Report



Cool Season Trial Garden
1401 Remington Street Fort Collins, CO 80523
NE Corner of College Avenue and Lake Street
Colorado State University
Department of Horticulture and Landscape Architecture
www.flowertrials.colostate.edu

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2020-2021 Cool Season Trial Performance Report

Dr. James E. Klett, David Staats, and Lauryn Schriener¹

Introduction

This is the thirteenth year that Colorado State University has conducted a Cool Season Trial at the Annual Flower Trial Garden. It marks the twenty-first year that the Annual Flower Trial Garden has been located adjacent to the University Center for the Arts at Colorado State University. The overall goal of this project is to determine which varieties of cool season plants are best suited for marketing and growing in the Rocky Mountain Region. Initial data was recorded in November 2020, then approximately every month from December 2020 to May 2021. Data was collected on a monthly basis when there was no snow coverage. Irrigation was monitored throughout the trials and any additional water given to these plants was recorded. Due to difficult winter weather conditions this season, the trials were not formally evaluated by industry professionals and company representatives in May 2021.

The cool season trials at Colorado State University have no specific operation dollars from university funds. Financial assistance, plant material, and other miscellaneous materials for the trials were acquired from sponsoring seed companies. Special thanks to Dale Kiyota at Kiyota Greenhouse for their generous support in growing a flat of each of the cool season varieties at a reduced cost. Some operational and staff dollars have come from Colorado State University Agricultural Experiment Station, Extension, and the Department of Horticulture and Landscape Architecture. Seed Companies that participated in this trial were: American Takii, Kieft Seed, PanAmerican Seed, Sakata, and Syngenta.

¹ Professor and Extension Landscape Horticulture Specialist; Horticulture Research Associate; Horticulture graduate student and 2020-2021 Cool Season Trial Coordinator; respectively.

Cultural Data for the 2020-2021 Cool Season Trial Garden

Planting Days

All cool season plants were planted on October 15th, 2020. All plants arrived from Kiyota Greenhouse as rooted seedlings in a 50-cell tray. They were transplanted into planting beds located in the Annual Flower Trial Garden at 1401 Remington Street. There was one plant planted per hole, and 15 plants were planted in each of the two rows of the beds for a total of 30 plants per variety.

Watering

All precipitation and irrigation was monitored. Irrigation was utilized when natural precipitation was low and when ground media was not saturated. The winter and spring season of 2020-2021 had more precipitation compared to 2019-2020 season. The beds were watered using the gardens irrigation system in October, November, December, April, and May. Watering from March until May was done with water from a frost-free line. The irrigation typically ran for 2-3 hours on a weekly basis. The irrigation system applies .39 inches of water per hour.

Weather Data October 2020 through May 2021

Winter temperatures in 2020-2021 were typical of a sporadic Colorado winter. This year's snow amount at the trials was higher than previous years. Depending on the amount of snow, the coverage on the trials lasted from a couple days to three weeks in length. The length of snow cover did have some negative impacts on the plants in our trial, specifically in February. In February, we had a major freezing event after a week of abnormally high temperatures. We have weather data showing in February, that for a four-day period, night temperatures were below zero with the lowest temperature being -11. Based on news articles, with windchill on those days, temperatures may have been as low as -20 for Fort Collins. During this time period, snow coverage was minimal, and damage was significant to all varieties in the trials. On May 2, Fort Collins received hail. While the hail was small and the duration was short, the varieties in the trials did not fair well. The first hard freeze (temperatures below 25°F) after the trials were planted was recorded on October 16th, 2020 with a temperature of 25°F. Temperature data for the 2020-2021 Cool Season Trials are listed in Table 1. Weather records were provided from CSU Colorado Climate Center which are located on the main campus near the student center. Wind-chill factors are not included but can be quite significant in Colorado's winter climate.

Month	Avg. Maximum Temperature (°F)	Avg. Minimum Temperature (°F)	Precipitation (inches)	Snow (inches)
October	63.3	31.6	1.14	14.5
November	57.6	27.2	0.64	3.7
December	47.7	18.9	0.50	6.9
January	44.7	20.1	0.3	5.6
February	38.1	14.8	0.81	10.1
March	52.9	26.8	2.66	19.9
April	61.4	32.4	2.15	12.1
May 1-15	64.3	40.8	3.32	2.7

https://climate.colostate.edu/data_access.html

In the 2020-2021 Cool Season Trial, we may have had the first record of some varieties being disturbed by geese. In December and January, the geese were laying in the grass area in the middle of the trial gardens. The geese were responsible for pulling a few plants out of the ground that I had to re-plant and eating what was left of the flowering kale after the first killing freeze. While we did not have any current management strategies for the geese, we have researched a single possible control to deter these birds from the trials in the future.

Data Collection Methods

Lauryn Schriener (Graduate Horticulture Student) collected data throughout the 2020-2021 Cool Season Trial.

The overall appearance rating scoring was: 1=poor condition (dying), 2=weak condition (struggling with some dieback), 3=average (few to no flowers with healthy foliage), 4=good condition (progressing flowers with healthy foliage growth), and 5 =great condition (many flowers with healthy uniform foliage growth).

The frost damage rating score was: 1 =poor condition (frost damage is significant), 2 =weak condition (struggling with some dieback), 3=average (healthy foliage), 4 =good condition (healthy foliage growth), and 5 =great condition (many flowers with healthy uniform foliage growth).

The bloom rate scoring was 1 = poor blooming (little to no blooms), 2 = minimal blooming (few blooms) 3 = average blooming (most are blooming, with several flowers), 4 = good blooming (multiple blooms on plants), 5 = great blooming (all plants are flowering prolifically)

Data was collected from November 2020 to May 2021 on a monthly basis.

Conclusion

The 2020-2021 Cool Season Trials were a mixed success. Despite a frost on October 16th, 2020, one day after the plants were transplanted into the Annual Trial Gardens; the plants did not suffer significant damage at this time. Plants did slightly heave in the spring months but that did not cause significant damage.

Due to the unusual weather in Spring 2021, many varieties had a rough growing season. We did not have an industry and committee evaluation in May 2021 because of the poor survival and condition of many of the varieties. Based on conversations with our committee, we plan to plant larger plugs or an entire four pack to provide the plant varieties with the most growth possible at planting in the fall.

While we did not have a formal evaluation day, as the coordinator, I was able to select a few varieties that survived with high numbers and look fairly well in May 2021. These varieties show the hardiness of seed breeding completed by these supporting companies this difficult growing season.

We thank all of our cooperators in the 2020-2021 Cool Season Trials for their support and look forward to your participation in the future cool season trials. We thank the companies that participated in the harsh 2020-2021 season and for your support in the 2021-2022 Cool Season Trials.

High Surviving Hardy Varieties

Pansy 'Nature Mulberry Shades' from American Takii

This pansy variety had a beautiful range of colors that fade from a deep purple with yellow center color to a light white-pink with yellow centered bloom. This variety had high survival with 25 out of the 30 plants coming through the winter.

Viola 'Gem Electric Blue' from American Takii

This variety had a high survival rating with 24 out of the 30 plants. These plants looked nice through-out the season even with the poor weather conditions. It had an attractive dark blue purple flower that covered the entire plant even in the snow.

Viola 'Quicktime™ Blue' from PanAmerican Seed

This variety had a high survival rating with 21 out of the 30 plants. These plants looked outstanding in early spring. It had an attractive dark purple flower with a yellow center that covered the entire plant.

Viola 'Gem Plum Antique' from American Takii

This viola had an attractive range of colors that faded from a deep plum color to a light white-pink bloom. This variety had high survival with 25 out of the 30 plants coming through the winter.

Viola 'Penny™ Orange Jump-up Imp.' from Syngenta

This viola had an attractive bicolor bloom of orange and purple with heavy blooming late in the spring season. This variety had high survival with 28 out of the 30 plants coming through the winter.

Viola 'Rebelina Blue & Yellow' from Sakata

This variety had a high survival rating with 21 out of the 30 plants. It had many two-toned flowers that covered the entire plant. Flowers stood tall above the foliage.

Survival Data

Survival data was collected at the end of April 2021. The data was based on how many survived out of the 30 plants per variety. A survived plant was any plant that had green vegetative growth.

Genus	Variety	Company	4/30/2021
Pansy	Freefall™ White	Syngenta	23
Pansy	Freefall™ XL White	Syngenta	26
Pansy	Delta™ Premium Pure White	Syngenta	25
Pansy	Delta™ Premium White with Blotch Imp.	Syngenta	13
Pansy	Freefall™ Purple & White	Syngenta	20
Pansy	Delta™ Premium Pure Yellow	Syngenta	17
Pansy	Freefall™ XL Bright Yellow	Syngenta	22
Pansy	Cool Wave® Yellow Golden	PanAmerican Seed	23
Pansy	Freefall™ Golden Yellow	Syngenta	22
Pansy	Delta™ Premium Gold with Blotch	Syngenta	25
Pansy	Delta™ Premium Pure Orange	Syngenta	27
Pansy	Nature Antique Shades	American Takii	14
Pansy	Nature Mulberry Shades	American Takii	25
Pansy	Freefall™ XL Fire	Syngenta	19
Pansy	Cool Wave® Sunshine and Wine	PanAmerican Seed	19
Pansy	Cool Wave® Raspberry Swirl	PanAmerican Seed	1
Pansy	Freefall™ Marina	Syngenta	12
Pansy	Delta™ Premium Pure Light Blue	Syngenta	8
Pansy	Delta™ Premium True Blue	Syngenta	2
Pansy	Freefall™ True Blue	Syngenta	8
Pansy	Cool Wave® Morpho	PanAmerican Seed	9
Pansy	Delta™ Premium Blue with Blotch	Syngenta	3
Pansy	Delta™ Premium Deep Blue	Syngenta	8

Pansy	Freefall™ Morpho	Syngenta	11
Pansy	Freefall™ Purple Wing	Syngenta	17
Pansy	Delta™ Premium Pure Violet Imp.	Syngenta	19
Pansy	Delta™ Premium Lavender Blue Shades	Syngenta	5
Aurinia	Gold Rush	Kieft Seed	0
Arabis	Barranca™ Rose Deep	Kieft Seed	0
Arabis	Barranca™ Pink	Kieft Seed	0
Primula	Lighthouse Mix	Sakata	0
Primula	Princessa Mix	Sakata	0
Viola	Quicktime™ White Blotch	PanAmerican Seed	1
Viola	Quicktime™ Mickey	PanAmerican Seed	23
Viola	Rebelina Golden Yellow	Sakata	14
Viola	Quicktime™ Yellow Blotch	PanAmerican Seed	12
Viola	Penny™ Orange Jump-up Imp.	Syngenta	28
Viola	Gem Apricot Antique	American Takii	24
Viola	Gem Plum Antique	American Takii	25
Viola	Gem Aztec	American Takii	12
Viola	Rebelina Red & Yellow	Sakata	16
Viola	Quicktime™ Yellow Blue Jump Up	PanAmerican Seed	13
Viola	Rebelina Blue & Yellow	Sakata	21
Viola	Quicktime™ Blue Purple Jump Up	PanAmerican Seed	8
Viola	Gem Electric Blue	American Takii	24
Viola	Quicktime™ Blue	PanAmerican Seed	21
Viola	Rebelina Purple & Yellow	Sakata	16
Viola	Quicktime™ Lemon Jump Up	PanAmerican Seed	10
Viola	Penny™ Violet Imp.	Syngenta	9
Flowering Kale	Peacock White	American Takii	0

Flowering Kale	Crystal White	American Takii	0
Flowering Kale	Fringe Leaf White	American Takii	0
Flowering Kale	Kamome White	American Takii	0
Flowering Kale	Crystal Pink	American Takii	0
Flowering Kale	Kamome Red	American Takii	0
Flowering Kale	Peacock Red	American Takii	0
Flowering Kale	Glamour Red	American Takii	0
Flowering Kale	Crystal Deep Red	American Takii	0
Flowering Kale	Fringe Leaf Red	American Takii	0
Flowering Kale	Crystal Red	American Takii	0

Frost Damage Rating by Student Coordinator

Frost Damage data was collected on a monthly basis. On a scale of 5-1, 5 represents significant frost damage while 1 represents great condition with healthy growth. "D" represents dead with no visible vegetation.

Genus	Variety	Company	Nov	Dec	Jan	Feb	March	April	May
Pansy	Freefall™ White	Syngenta	3	2	2	2	2	3	3
Pansy	Freefall™ XL White	Syngenta	3	2	2	2	2	3	3
Pansy	Delta™ Premium Pure White	Syngenta	3	2	2	2	2	4	3
Pansy	Delta™ Premium White with Blotch Imp.	Syngenta	3	2	2	2	2	2	3
Pansy	Freefall™ Purple & White	Syngenta	3	3	3	2	2	2	3
Pansy	Delta™ Premium Pure Yellow	Syngenta	3	3	3	2	2	2	3
Pansy	Freefall™ XL Bright Yellow	Syngenta	3	3	3	2	2	4	3
Pansy	Cool Wave® Yellow Golden	PanAmerican Seed	3	3	3	2	2	3	3
Pansy	Freefall™ Golden Yellow	Syngenta	3	3	3	2	2	3	3

Pansy	Delta™ Premium Gold with Blotch	Syngenta	3	2	2	2	2	2	2
Pansy	Delta™ Premium Pure Orange	Syngenta	3	2	2	2	2	3	3
Pansy	Nature Antique Shades	American Takii	3	3	3	2	2	3	3
Pansy	Nature Mulberry Shades	American Takii	3	3	3	2	2	4	2
Pansy	Freefall™ XL Fire	Syngenta	3	3	3	2	2	3	3
Pansy	Cool Wave® Sunshine and Wine	PanAmerican Seed	3	2	2	2	2	3	3
Pansy	Cool Wave® Raspberry Swirl	PanAmerican Seed	3	2	2	1	1	D	D
Pansy	Freefall™ Marina	Syngenta	3	3	3	2	1	2	3
Pansy	Delta™ Premium Pure Light Blue	Syngenta	3	3	3	2	2	2	3
Pansy	Delta™ Premium True Blue	Syngenta	3	3	3	2	1	2	2
Pansy	Freefall™ True Blue	Syngenta	3	2	2	2	1	2	2
Pansy	Cool Wave® Morpho	PanAmerican Seed	3	2	2	1	1	2	2
Pansy	Delta™ Premium Blue with Blotch	Syngenta	3	2	2	2	1	2	2
Pansy	Delta™ Premium Deep Blue	Syngenta	3	2	2	2	2	2	3
Pansy	Freefall™ Morpho	Syngenta	3	3	3	2	2	3	3
Pansy	Freefall™ Purple Wing	Syngenta	3	3	3	2	2	3	2
Pansy	Delta™ Premium Pure Violet Imp.	Syngenta	3	3	3	2	1	2	3
Pansy	Delta™ Premium Lavender Blue Shades	Syngenta	3	2	2	2	1	2	2
Aurinia	Gold Rush	Kieft Seed	2	1	1	2	1	D	D
Arabis	Barranca™ Rose Deep	Kieft Seed	2	1	1	1	1	D	D
Arabis	Barranca™ Pink	Kieft Seed	2	1	1	1	1	D	D
Primula	Lighthouse Mix	Sakata	2	1	1	1	1	D	D
Primula	Princessa Mix	Sakata	2	1	1	2	1	D	D
Viola	Quicktime™ White Blotch	PanAmerican Seed	3	2	2	1	1	2	2
Viola	Quicktime™ Mickey	PanAmerican Seed	3	2	2	2	1	3	4

Viola	Rebelina Golden Yellow	Sakata	3	2	2	1	1	3	3
Viola	Quicktime™ Yellow Blotch	PanAmerican Seed	3	2	2	1	1	3	3
Viola	Penny™ Orange Jump-up Imp.	Syngenta	3	3	3	1	1	4	4
Viola	Gem Apricot Antique	American Takii	3	2	2	2	1	3	4
Viola	Gem Plum Antique	American Takii	3	3	3	2	2	4	4
Viola	Gem Aztec	American Takii	3	3	3	2	2	3	2
Viola	Rebelina Red & Yellow	Sakata	3	2	2	1	1	3	2
Viola	Quicktime™ Yellow Blue Jump Up	PanAmerican Seed	3	3	3	2	1	3	3
Viola	Rebelina Blue & Yellow	Sakata	3	3	3	2	2	3	3
Viola	Quicktime™ Blue Purple Jump Up	PanAmerican Seed	3	1	1	2	1	2	2
Viola	Gem Electric Blue	American Takii	3	4	4	3	2	4	3
Viola	Quicktime™ Blue	PanAmerican Seed	3	3	3	2	1	4	3
Viola	Rebelina Purple & Yellow	Sakata	3	3	3	2	1	3	2
Viola	Quicktime™ Lemon Jump Up	PanAmerican Seed	3	3	3	2	1	2	2
Viola	Penny™ Violet Imp.	Syngenta	3	3	3	2	1	2	2
Flowering Kale	Peacock White	American Takii	2	1	1	D	D	D	D
Flowering Kale	Crystal White	American Takii	2	1	1	D	D	D	D
Flowering Kale	Fringe Leaf White	American Takii	2	1	1	D	D	D	D
Flowering Kale	Kamome White	American Takii	2	1	1	D	D	D	D
Flowering Kale	Crystal Pink	American Takii	2	1	1	D	D	D	D
Flowering Kale	Kamome Red	American Takii	2	2	2	D	D	D	D
Flowering Kale	Peacock Red	American Takii	2	1	1	D	D	D	D

Flowering Kale	Glamour Red	American Takii	2	1	1	D	D	D	D
Flowering Kale	Crystal Deep Red	American Takii	2	1	1	D	D	D	D
Flowering Kale	Fringe Leaf Red	American Takii	2	1	1	D	D	D	D
Flowering Kale	Crystal Red	American Takii	2	1	1	D	D	D	D

Overall Appearance Rating by Student Coordinator

Overall Appearance data was collected on a monthly basis. On a scale of 1-5, 1 represents dying while 5 represents great condition with healthy growth. "D" represents dead with no visible vegetation.

Genus	Variety	Company	Nov	Dec	Jan	Feb	March	April	May
Pansy	Freefall™ White	Syngenta	3	3	3	2	2	3	3
Pansy	Freefall™ XL White	Syngenta	3	3	3	2	2	3	3
Pansy	Delta™ Premium Pure White	Syngenta	3	3	3	2	2	4	3
Pansy	Delta™ Premium White with Blotch Imp.	Syngenta	3	3	3	2	2	3	3
Pansy	Freefall™ Purple & White	Syngenta	3	3	3	2	3	3	3
Pansy	Delta™ Premium Pure Yellow	Syngenta	3	3	3	2	3	3	3
Pansy	Freefall™ XL Bright Yellow	Syngenta	3	3	3	2	3	4	3
Pansy	Cool Wave® Yellow Golden	PanAmerican Seed	3	3	3	2	2	3	3
Pansy	Freefall™ Golden Yellow	Syngenta	3	3	3	2	2	3	3
Pansy	Delta™ Premium Gold with Blotch	Syngenta	3	3	3	2	2	3	2
Pansy	Delta™ Premium Pure Orange	Syngenta	3	3	3	2	2	3	3
Pansy	Nature Antique Shades	American Takii	3	2	2	2	2	3	3

Pansy	Nature Mulberry Shades	American Takii	3	3	3	2	2	3	3
Pansy	Freefall™ XL Fire	Syngenta	3	3	3	2	2	3	3
Pansy	Cool Wave® Sunshine and Wine	PanAmerican Seed	3	3	3	2	2	3	3
Pansy	Cool Wave® Raspberry Swirl	PanAmerican Seed	3	2	2	1	2	D	D
Pansy	Freefall™ Marina	Syngenta	3	3	3	2	1	2	3
Pansy	Delta™ Premium Pure Light Blue	Syngenta	3	3	3	2	2	2	2
Pansy	Delta™ Premium True Blue	Syngenta	3	3	3	2	1	2	2
Pansy	Freefall™ True Blue	Syngenta	3	3	3	2	1	2	2
Pansy	Cool Wave® Morpho	PanAmerican Seed	3	2	2	2	2	2	2
Pansy	Delta™ Premium Blue with Blotch	Syngenta	3	2	2	2	1	2	2
Pansy	Delta™ Premium Deep Blue	Syngenta	3	2	2	2	1	2	3
Pansy	Freefall™ Morpho	Syngenta	3	3	3	2	2	2	3
Pansy	Freefall™ Purple Wing	Syngenta	3	3	3	2	2	3	2
Pansy	Delta™ Premium Pure Violet Imp.	Syngenta	3	3	3	2	2	3	3
Pansy	Delta™ Premium Lavender Blue Shades	Syngenta	3	2	2	2	2	2	2
Aurinia	Gold Rush	Kieft Seed	3	2	2	2	2	D	D
Arabis	Barranca™ Rose Deep	Kieft Seed	2	1	1	1	1	D	D
Arabis	Barranca™ Pink	Kieft Seed	2	1	1	1	1	D	D
Primula	Lighthouse Mix	Sakata	3	2	2	1	1	D	D
Primula	Princessa Mix	Sakata	3	2	2	1	1	D	D
Viola	Quicktime™ White Blotch	PanAmerican Seed	3	2	2	1	1	2	2
Viola	Quicktime™ Mickey	PanAmerican Seed	3	2	2	2	1	3	4
Viola	Rebelina Golden Yellow	Sakata	3	2	2	2	1	2	2
Viola	Quicktime™ Yellow Blotch	PanAmerican Seed	3	2	2	1	1	2	3
Viola	Penny™ Orange Jump-up Imp.	Syngenta	3	3	3	2	2	4	5
Viola	Gem Apricot Antique	American Takii	3	2	2	2	2	2	4

Viola	Gem Plum Antique	American Takii	3	3	3	2	2	4	4
Viola	Gem Aztec	American Takii	3	3	3	2	2	2	2
Viola	Rebelina Red & Yellow	Sakata	3	3	3	2	1	2	3
Viola	Quicktime™ Yellow Blue Jump Up	PanAmerican Seed	3	3	3	2	2	2	3
Viola	Rebelina Blue & Yellow	Sakata	3	3	3	3	2	3	4
Viola	Quicktime™ Blue Purple Jump Up	PanAmerican Seed	3	2	2	2	1	2	2
Viola	Gem Electric Blue	American Takii	3	3	3	4	3	4	4
Viola	Quicktime™ Blue	PanAmerican Seed	3	3	3	3	2	4	4
Viola	Rebelina Purple & Yellow	Sakata	3	2	2	2	2	3	3
Viola	Quicktime™ Lemon Jump Up	PanAmerican Seed	3	3	3	2	2	2	2
Viola	Penny™ Violet Imp.	Syngenta	3	3	3	2	2	2	2
Flowering Kale	Peacock White	American Takii	3	2	2	D	D	D	D
Flowering Kale	Crystal White	American Takii	3	1	1	D	D	D	D
Flowering Kale	Fringe Leaf White	American Takii	3	2	2	D	D	D	D
Flowering Kale	Kamome White	American Takii	3	2	2	D	D	D	D
Flowering Kale	Crystal Pink	American Takii	3	2	2	D	D	D	D
Flowering Kale	Kamome Red	American Takii	3	2	2	D	D	D	D
Flowering Kale	Peacock Red	American Takii	3	1	1	D	D	D	D
Flowering Kale	Glamour Red	American Takii	3	1	1	D	D	D	D
Flowering Kale	Crystal Deep Red	American Takii	3	1	1	D	D	D	D

Flowering Kale	Fringe Leaf Red	American Takii	3	1	1	D	D	D	D
Flowering Kale	Crystal Red	American Takii	3	1	1	D	D	D	D

Bloom Rating by Student Coordinator

Bloom Rating data was collected on a monthly basis. On a scale of 1-5, 1 represents no blooms while 5 represents prolific flowering. "D" represents dead with no visible vegetation.

Genus	Variety	Company	Nov	Dec	Jan	Feb	March	April	May
Pansy	Freefall™ White	Syngenta	3	2	2	1	1	2	4
Pansy	Freefall™ XL White	Syngenta	3	2	2	2	1	2	4
Pansy	Delta™ Premium Pure White	Syngenta	3	2	2	1	1	3	4
Pansy	Delta™ Premium White with Blotch Imp.	Syngenta	3	2	2	1	2	2	3
Pansy	Freefall™ Purple & White	Syngenta	3	2	2	2	3	2	3
Pansy	Delta™ Premium Pure Yellow	Syngenta	3	2	2	1	2	2	4
Pansy	Freefall™ XL Bright Yellow	Syngenta	3	2	2	2	3	5	5
Pansy	Cool Wave® Yellow Golden	PanAmerican Seed	3	2	2	2	2	3	5
Pansy	Freefall™ Golden Yellow	Syngenta	3	2	2	2	2	3	4
Pansy	Delta™ Premium Gold with Blotch	Syngenta	3	2	2	2	2	2	3
Pansy	Delta™ Premium Pure Orange	Syngenta	3	2	2	1	1	2	4
Pansy	Nature Antique Shades	American Takii	2	1	1	1	1	2	3
Pansy	Nature Mulberry Shades	American Takii	2	1	1	1	1	3	4
Pansy	Freefall™ XL Fire	Syngenta	2	1	1	1	1	3	5
Pansy	Cool Wave® Sunshine and Wine	PanAmerican Seed	2	1	1	1	1	3	4

Pansy	Cool Wave® Raspberry Swirl	PanAmerican Seed	2	1	1	1	1	D	D
Pansy	Freefall™ Marina	Syngenta	3	2	2	1	1	2	3
Pansy	Delta™ Premium Pure Light Blue	Syngenta	3	2	2	1	1	2	2
Pansy	Delta™ Premium True Blue	Syngenta	3	2	2	1	1	2	3
Pansy	Freefall™ True Blue	Syngenta	3	2	2	2	1	2	3
Pansy	Cool Wave® Morpho	PanAmerican Seed	2	1	1	1	1	2	2
Pansy	Delta™ Premium Blue with Blotch	Syngenta	2	2	2	1	1	2	3
Pansy	Delta™ Premium Deep Blue	Syngenta	2	1	1	1	1	2	4
Pansy	Freefall™ Morpho	Syngenta	3	2	2	1	1	3	4
Pansy	Freefall™ Purple Wing	Syngenta	3	2	2	1	1	2	2
Pansy	Delta™ Premium Pure Violet Imp.	Syngenta	3	2	2	2	1	2	3
Pansy	Delta™ Premium Lavender Blue Shades	Syngenta	3	2	2	2	1	2	3
Aurinia	Gold Rush	Kieft Seed	1	1	1	1	1	D	D
Arabis	Barranca™ Rose Deep	Kieft Seed	1	1	1	1	1	D	D
Arabis	Barranca™ Pink	Kieft Seed	1	1	1	1	1	D	D
Primula	Lighthouse Mix	Sakata	1	1	1	1	1	D	D
Primula	Princessa Mix	Sakata	1	1	1	1	1	D	D
Viola	Quicktime™ White Blotch	PanAmerican Seed	3	2	2	1	1	2	2
Viola	Quicktime™ Mickey	PanAmerican Seed	3	1	1	1	1	3	3
Viola	Rebelina Golden Yellow	Sakata	3	2	2	1	1	2	3
Viola	Quicktime™ Yellow Blotch	PanAmerican Seed	3	1	1	1	1	2	4
Viola	Penny™ Orange Jump-up Imp.	Syngenta	3	1	1	1	1	3	4
Viola	Gem Apricot Antique	American Takii	3	1	1	1	1	2	3
Viola	Gem Plum Antique	American Takii	3	1	1	1	1	3	5

Viola	Gem Aztec	American Takii	3	1	1	2	3	2	3
Viola	Rebelina Red & Yellow	Sakata	3	1	1	1	1	2	2
Viola	Quicktime™ Yellow Blue Jump Up	PanAmerican Seed	3	2	2	2	2	2	3
Viola	Rebelina Blue & Yellow	Sakata	3	2	2	2	1	3	4
Viola	Quicktime™ Blue Purple Jump Up	PanAmerican Seed	3	1	1	2	1	1	3
Viola	Gem Electric Blue	American Takii	3	3	3	3	3	4	5
Viola	Quicktime™ Blue	PanAmerican Seed	3	2	2	2	2	4	5
Viola	Rebelina Purple & Yellow	Sakata	3	1	1	1	1	3	3
Viola	Quicktime™ Lemon Jump Up	PanAmerican Seed	3	2	2	1	1	1	2
Viola	Penny™ Violet Imp.	Syngenta	3	2	2	1	2	1	1
Flowering Kale	Peacock White	American Takii	1	1	1	D	D	D	D
Flowering Kale	Crystal White	American Takii	1	1	1	D	D	D	D
Flowering Kale	Fringe Leaf White	American Takii	1	1	1	D	D	D	D
Flowering Kale	Kamome White	American Takii	1	1	1	D	D	D	D
Flowering Kale	Crystal Pink	American Takii	1	1	1	D	D	D	D
Flowering Kale	Kamome Red	American Takii	1	1	1	D	D	D	D
Flowering Kale	Peacock Red	American Takii	1	1	1	D	D	D	D
Flowering Kale	Glamour Red	American Takii	1	1	1	D	D	D	D
Flowering Kale	Crystal Deep Red	American Takii	1	1	1	D	D	D	D

Flowering Kale	Fringe Leaf Red	American Takii	1	1	1	D	D	D	D
Flowering Kale	Crystal Red	American Takii	1	1	1	D	D	D	D