

## Aster Production

Sakata Seed America



#### ASTER



Native Region Northern China

**Common Name** Aster

**Botanical Name** *Callistephus chinensis* 

**Flower Language** Amor, Delicadeza



### **Aster Production**

Calistephus chinensis



#### Matsumoto Mix

- Popular for its bright festive colors and long vase life (2 weeks).
- 100 days from sowing
- Ideal for mixed vase arrangements and bouquets.

**SAKATA**<sup>®</sup>

#### MATSUMOTO



- Available in 10 colors and a mix.
- The first Aster series with Fusarium tolerance released to the market.
- Flower size, 2 inches / 5 cm. with a distinct yellow center.
- Plants feature strong and long stems with upright flowering habit.
- Production cycle is approximately 14 weeks (100 days) from spring sowing or when employing day length manipulation.
- Height ranges from  $2-2\frac{1}{2}$  feet / 60-75 cm.



### Aster Azumi XL



#### Aster Azumi XL

- Aster Azumi XL is similar to Aster Bonita with a larger pompón flower that completely covers the center with petals when mature.
- Aster Azumi XL flowers in 14 weeks, similar to Aster Matsumoto, a week earlier than Aster Bonita.

SAKATA

### Aster Azumi XL



Red

Rose

White

Blue

**SAKATA**<sup>®</sup>

The flower diameter of the Aster Azumi XL series is large under natural production at 2.5-2.75-inches/6-7 cm. Disbudding flowers produces an even larger flower diameter at 5-inches/10 cm.

### **Disbud Treatment**

Disbudded: the flower size reaches is close to 5-inches/10cm. in diameter



### Aster Bonita\*



#### Aster Bonita

- New pompón-type flower. The center completely fills in when mature.
- Same culture as Aster Mastumoto, with one week longer crop time (15 weeks).
- Ideal for arrangements and bouquets.

\*Bonita requires one week more of production compared to Azumi Xl and Matsumoto.

**SAKATA**<sup>®</sup>

### **BONITA SERIES**

Characteristics of the Variety:

- Beautiful Pompon flowers
- 2 inch / 5 cm. flower size
- Fusarium tolerance, similar to Matsumoto.
- Approximately 15 weeks (105 days).
- Center bud removal is not necessary, but removal improves the stem presentation.
- Available in 9 colors:
- Blue, Light Blue, Pink, Rose, Scarlet, Shell Pink, Top Blue, Top Rose, White





### **Flower Development**



As the flowers begin to open, the beautiful pompon flower form gradually appears over 7-9 days.

**SAKATA**<sup>®</sup>

### Serenade\*



Serenade Mix

• Micro Aster type which is ideal for bouquets or in place of baby's breath or other filler flowers.

\*Aster Serenade requires one less week of production compared to Azumi XL and Matsumoto.



#### Aster Serenade



- Available in 10 colors.
- Fusarium tolerance.
- Flower size is 1.25 inches / 3 cm. with a distinct yellow center.
- Spray habit with an abundance of semi-double flowers on a single stem.
- The production cycle is approximately 13 weeks (90 days) from a spring sowing or when employing day-length manipulation.

**SAKATA**<sup>®</sup>

- The colors of Red and Blue were recognized with a Fleuroselect Quality Award
- Height 2-2.5 feet / 60-75 cm.

#### Typical Aster Matsumoto and Azumi XL Schedule at temperatures between 60-75°F

Plug Stage	Transplant – Bulking	Long days – Bud Initiation	Flower Bud Development	Crop Time
4-5 weeks	2 weeks**	3 weeks (minimum)	5 weeks	14-15 weeks
68°F	68-70°F	50-55°F	55-59°F	
Short days*		Long days***	Ambient light	

**Note:** Interrupt the night with 4 continuous hours of light for 3-4 weeks in combination with heating to produce a strong vegetative growth in less time compared to cyclical lighting with cooler night temperatures. After flower bud intitiation, finish the crop with short days for greater uniformity. Nevertheless, the crop will flower with long days, but the flowering window will be longer.

SAKA

\* Short days (<12 hours) or transplant at 3 leaf stage

\*\* Maintain ambient light until the plants have 5-6 true leaves

**\*\*\*** Night interruption for 4 hours or day length extension to 16 hours. Minimum 10 f.c./110 lux Maintain long days until the stems are 2/3rds the final desired height.

#### Typical Aster Bonita Schedule at temperatures between 60-75°F

Plug Stage	Transplant – Bulking	Long days – Bud Initiation	Flower Bud Development	Crop Time
4-5 weeks	2 weeks**	3 weeks (minimum)	6 weeks	15-16 weeks
68°F	68-70°F	50-55°F	55-59°F	
Short days*		Long days***	Ambient light	

**Note:** Interrupt the night with 4 continuous hours of light for 3-4 weeks in combination with heating to produce a strong vegetative growth in less time compared to cyclical lighting with cooler night temperatures. After flower bud intitiation, finish the crop with short days for greater uniformity. Nevertheless, the crop will flower with long days, but the flowering window will be longer.

SAKA

\* Short days (<12 hours) or transplant at 3 leaf stage

\*\* Maintain ambient light until the plants have 5-6 true leaves

**\*\*\*** Night interruption for 4 hours or day length extension to 16 hours. Minimum 10 f.c./110 lux Maintain long days until the stems are 2/3rds the final desired height.

#### Typical Aster Serenade Schedule at temperatures between 60-75°F

Plug Stage	Transplant – Bulking	Long days – Bud Initiation	Flower Bud Development	Crop Time
4-5 weeks	2 weeks**	3 weeks (minimum)	4 weeks	13-14 weeks
68°F	68-70°F	50-55°F	55-59°F	
Short days*		Long days***	Ambient light	

**Note:** Interrupt the night with 4 continuous hours of light for 3-4 weeks in combination with heating to produce a strong vegetative growth in less time compared to cyclical lighting with cooler night temperatures. After flower bud intitiation, finish the crop with short days for greater uniformity. Nevertheless, the crop will flower with long days, but the flowering window will be longer.

SAKA

\* Short days (<12 hours) or transplant at 3 leaf stage

\*\* Maintain ambient light until the plants have 5-6 true leaves

**\*\*\*** Night interruption for 4 hours or day length extension to 16 hours. Minimum 10 f.c./110 lux Maintain long days until the stems are 2/3rds the final desired height.

### Stage One: Days 1-10 Matsumoto



- Select a well-drained and sterile media, with a pH between 5.8-6.2.
  - Before sowing, moisten the media to the point of drip.
    Afterwards, sow the seed and lightly cover with medium vermiculite. Do not water the tray after sowing or the day following sowing. Then, keep the substrate constantly moist at a temperature of 70°F/21°C.



### Stage One: Days 1-10 Serenade



Covered with plug media - Covered with vermiculite

- Aster Serenade requires high aeration for optimum germination. A substrate with excess moisture reduces germination.
- For Serenade a *fluctuation of temperature* is recommended.
  Maintain 75°F/24°C for 12 hours during the day and 60°F/16°C for 12 hours at night.



## Stage Two: Days 11-20



- After seedlings emerge, place flats in a bright greenhouse and reduce humidity and air temperature to 60-70°F /15-21°C.
- Lightly feed with 100-150 ppm Nitrogen.



## Stage Three: Days 21-28



- Provide plenty of light and air circulation and fertilize as needed to maintain an E.C. level of 0.7 to 1.0 mmhos (1:2 dilution).
- The use of Calcium Nitrate based fertilizer promotes strong stems and roots.

**SAKATA**<sup>®</sup>

# Stage Four: Day 30



- The plugs are ready for transplanting.
- Asters are sensitive to photoperiod and stress conditions. To maximize stem length do not delay transplanting.
- Providing short day conditions (< 12 hours) during long days is recommended for large transplants (field).

**SAKATA**<sup>®</sup>

## **Boron deficiency**



- Asters are sensitive to boron deficiency.
- Symptoms are tip abortion, leaf crinkling and edge burn.
- Maintain pH levels between 5.8
   6.2 and apply a total of 0.25
  ppm of boron at each irrigation (including the amount found in the water source).



## Boron deficiency - root effects



With a deficiency, the root hairs are also negatively affected, which limits boron absorption.

- Boron is responsible for maintaining calcium in a soluble form.
- Boron can not be chelated so its pH range is more narrow than other micro elements.
- Competitive with calcium and easily leached.

SAKATA

• Readily available below 6.0

## Uneven germination



- When aster plugs are started in a germination chamber and then subjected to high light and high temperature moisture management becomes more critical.
- Maintain even moisture and moderate temperatures and light levels until seedlings are established.

SAKATA

### **Improved Germination**



- Improved moisture control leads to improved germination.
- Applying a more even and thicker layer of vermiculite improved germination and uniformity.



# Transplanting



- Select a cut flower bed rich in organic matter where asters have not been grown the previous year.
- To prevent problems with fusarium, use crop rotation by planting in the same bed every other year.



### **Disease prevention**



For greenhouse beds that are steam sterilized between
crops, successive crops may
be grown but crop rotation is
still recommended
periodically to lower disease
pressure. The principle of
crop rotation is important.



### Good drainage and aeration



 In heavy soils (high clay content) that lack organic matter and large pore spaces, it is necessary to raise the level of the flower bed to improve drainage and aeration for optimum root development.



### Comparison of Roots

Non-raised cut flower bed

**Raised cut flower bed** 



# **Spacing - Temperature**



Along the edge it is common to transplant two plugs.

- In general, space plants 6 x 6 inches / 15 x 15 cm. apart.
- Maintain good air circulation and temperatures between 60-70°F/15-21°C.

SAKATA

• Provide support.

### Impact of Spacing



Distance 6 inches - Distance 4 inches



The stem on the left shows better branching with smaller flowers. It is necessary to adjust spacing according to market demand or customer preference.

#### Rosette





**SAKATA**<sup>®</sup>

Rosetting occurs primarily under cool temperatures ( $< 50^{\circ}$ F) and short day (< 12 hours) conditions.

### Watering



Subirrigation (by drip or aisle) is recommended to avoid wetting the foliage and minimize foliar fungal diseases.

**SAKATA®** 

#### No Pinch Required



Sakata's asters were bred to with a natural floral spray form without pinching. Therefore, no pinching is necessary.



### Avoid re-cropping failure



- Asters bred by another breeding company, which are <u>not</u> Fusarium-tolerant, are planted in the center cut flower bed.
- Sakata's asters, which were bred to be Fusarium tolerant, are planted in the other cut flower beds. Nevertheless, crop rotation it is strongly recommended. Never produce Asters in the same cut flower bed two consecutive years.

**SAKATA**<sup>®</sup>

## Chrysanthemum vs. Aster



- Asters initially require short days for vegetative growth, then long days (>14 hours) for flower initiation followed by short days (<12 hours) for flower development.\*
- Chrysanthemums require long days for vegetative growth., then short days for both flower initiation and flower development.

\*Asters will still produce flowers under a long day finish, but the crop will be less uniform.



## **Flower Initiation**



- When asters have 5 true leaves, they are sensitive to flower initiation.
- Bud formation begins when the days are long (>14 hours) with final development under short day conditions (<12 hours).



### Fertilizer



- Fertilize as needed to maintain a soil E.C. of 0.7 to 1.0 mmhos/cm. (1:2 extraction).
- Soils with an E.C. level less
  than 0.5 will cause lower leaves
  to yellow. An E.C. level greater
  than 1.0 mmhos/cm. promote
  large leaves, delayed flowering
  and decreased vase life.

**SAKATA** 

#### Aeration



The best solution to prevent disease, like grey mold (*Botrytis cinerea*), is ventilation and strong air movement.

**SAKATA**<sup>®</sup>

## Magnesium deficiency



- Calcium based fertilizers promote strong stems and a dark green color.
- Be sure to supply sufficient magnesium to balance calcium levels.
- Cal/Mag fertilizers are highly recommended.
- A good ration of calcium to magnesium is 2:1.



## Winter flowering



- For winter flowering provide 4 hours of supplemental light starting at the 5th true leaf stage for at least 3 weeks from 22:00 to 02:00 using ordinary mum lighting (incandescent or compact fluorescent).
- Apply short days (<12 hours) when stems are 2/3 final desired height.

SAKATA

### **Summer Production**



- Transplant early or apply short days (< 12 hours) in early stages, from spring to fall to delay flower initiation.
- Interrupting the night from 22:00 to 02:00 ensures rapid flower initiation.
- Commence short day treatment when the crop is 2/3 the final desired height.



### Year-round production



• It is possible to produce Asters year-round by manipulating the photoperiod.



# Flowering



• For outdoor production in northern latitudes sow in mid-April for flowering in early-August.



#### **Deformed Flower**



Deformed flowers often appear under conditions of low temperature (< 50°F/10°C) and short days (< 12 hours) conditions. Target a minimum production temperature of 57-59°F/14-15°C.

**SAKATA<sup>®</sup>** 

#### Deformed Flowers in Outdoor Production



- Aster Bonita easily absorbs nutrients. Therefore, excess fertilizer or water increases the likelihood of deformed flowers.
- Outdoor production is more challenging because there is less control during rainy periods.
- The first flower especially has this tendency in soils with excess fertilizer (EC > 1.8 mmhos).

SAKATA

# Harvesting



- For long distance shipping cut stems when 2-3 flowers are one quarter open.
- In general, one can expect 5-7 flowers per stem.
- Strip off the bottom leaves and place stems in tepid water in a cool area for rehydration.
- Hold at 35-40°F / 2-4°C.



# Harvesting



- For local markets one can cut when flower show full color but before pollen ripens.
- Usually sold in bunches of 5 stems with a minimum of 15 open flowers.



#### Insects and Disease



### Elevated pH



Maintain a pH between 5.5 y 6.5

 Asters prefer completely acid soils. A high pH (>6.5) initially causes the veins of lower leaves to turn yellow, followed by brown spots.





#### Matsumoto Apricot and Light Blue



Leaves of Matsumoto (especially Apricot and Light Blue) may show a problem with brown spots on the leaves. This physiological symptom occurs in all seasons, above all with outdoor production. The cause is related to high pH (> 6.5). It is recommended to keep the pH between 5.5 -6.5 and reduce the alkalinity of the irrigation water (< 160 HCO3) with mineral acid if necessary.



### Spider Mites



### Spider Mites



#### Leaf Miners



#### Grey Mold *Botrytis cinerea*



- Grey mold appears on the upper part of the plant under conditions of high humidity and low temperature (< 65°F/18°C). Infected plants should be immediately destroyed and ventilation increased.
- The most effective method to prevent this disease consists in temperature control and good air movement (ventilation).
- Grey Mold cannot reproduce or spread in conditions of low humidity and a temperature above 72F / 22°C.





#### Fusarium Fusarium oxysporum





- Fusarium wilt is a common disease of aster which results in vascular wilt of the stem.
- Non-disinfected soils coupled with high temperature conditions facilitate the expression of this disease.
- The disease is not easy to control, even when growers apply steam sterilization between crops.
- Do not plant asters in the same ground for more than one year and allow one year to pass between replanting asters in the same ground.



#### Fusarium Fusarium oxysporum



• Fusarium infects the vascular system of aster, causing the veins of lower leaves to initially become yellow, and ending with the complete collapse of the plant.



**SAKATA**<sup>®</sup>

#### Downy Mildew Bremia taraxci



- Downy Mildew expresses under high humidity conditions and a tempeature around 59°F/15°C.
- Brown spots appear on the upper leaf surface. At the same time white-colored mildew shows on the lower leaf surface.
- This disease is controlled through soil sterilizaiton prior to transplanting, good ventilaiton and applying preventitive fungicides to the foliage.





## Thank you for your attention!





