



# Asparagus growing: Latest techniques in China

**Dr. Wenjing Chen**

wenjing@walkerseed.com

www.walkerseed.com



**WALKER**  
Brothers, Inc.  
Seeds and Plants



International Asparagus Days  
Cesena, Italy  
October 16, 2018

# Outline



## History



## Growing and harvest



## Varieties and breeding progress



## Main challenges

# History of asparagus cultivation in China



# Main asparagus cultivation regions





# Annual growth cycle in Northeast China

Harbin (126.63°E, 45.75°N)

**Dormancy**



**Growth period**

**Dormancy**

Jan

Feb

Mar

Apr

May

Jun

July

Aug

Sep

Oct

Nov

Dec



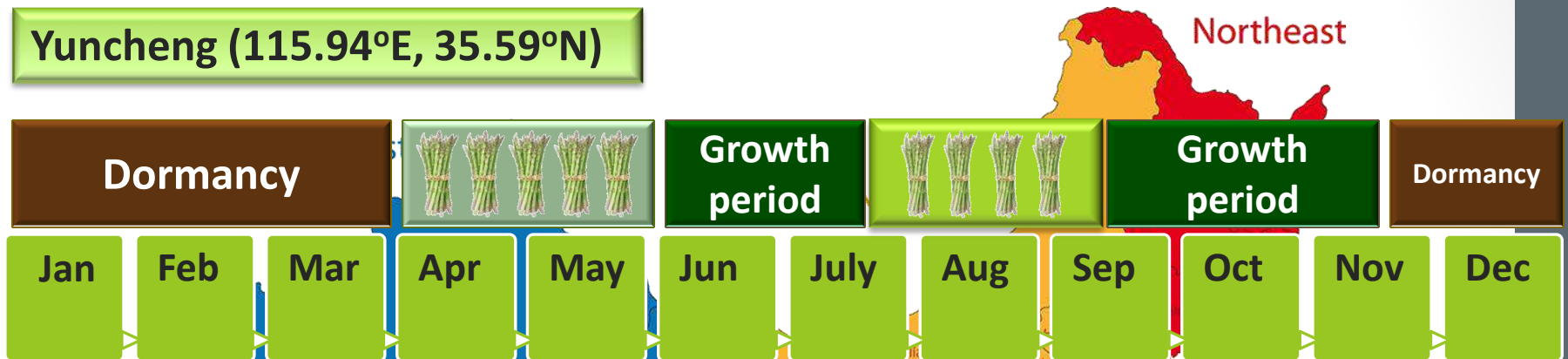
South Central



International Asparagus Days  
Cesena, Italy  
October 16, 2018

# Annual growth cycle in Northern China

Yuncheng (115.94°E, 35.59°N)



South Central

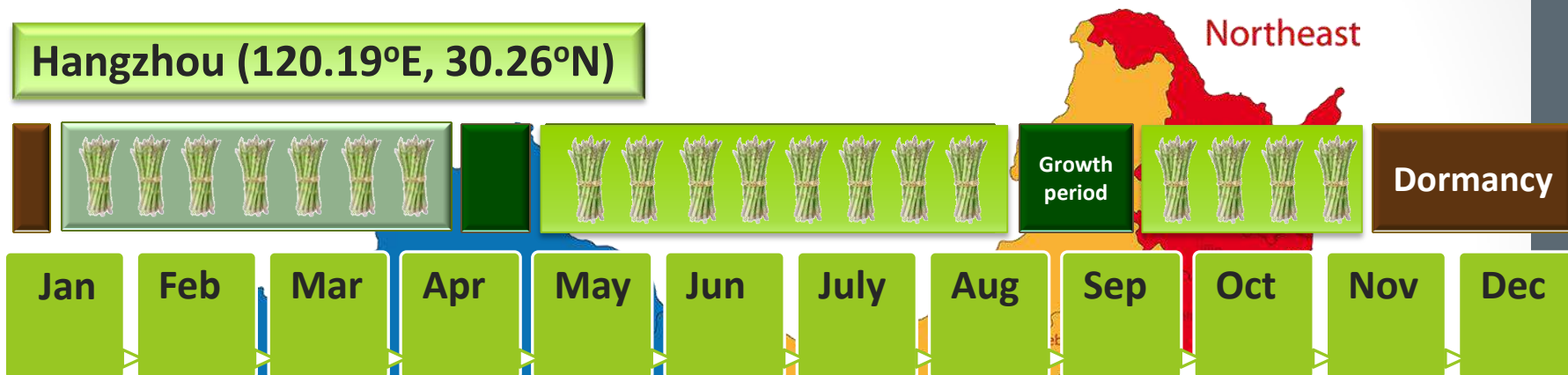


International Asparagus Days  
Cesena, Italy  
October 16, 2018



# Annual growth cycle in Eastern China

Hangzhou (120.19°E, 30.26°N)



South Central



International Asparagus Days  
Cesena, Italy  
October 16, 2018

# Annual growth cycle in Southwest China

Yanshan (104.35°E, 23.62°N)



South Central

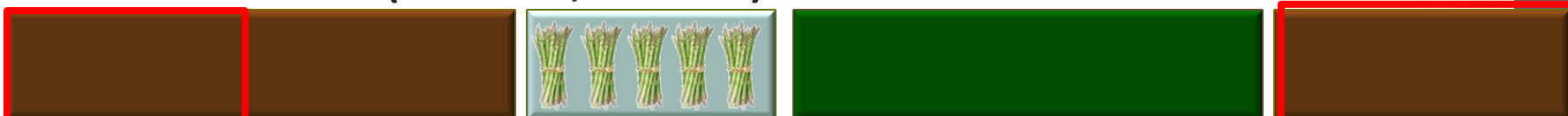


International Asparagus Days  
Cesena, Italy  
October 16, 2018



# Annual growth cycle in different parts of China

Northeast - Harbin (126.63°E, 45.75°N)



North - Yuncheng (115.94°E, 35.59°N)



East - Hangzhou (120.19°E, 30.26°N)

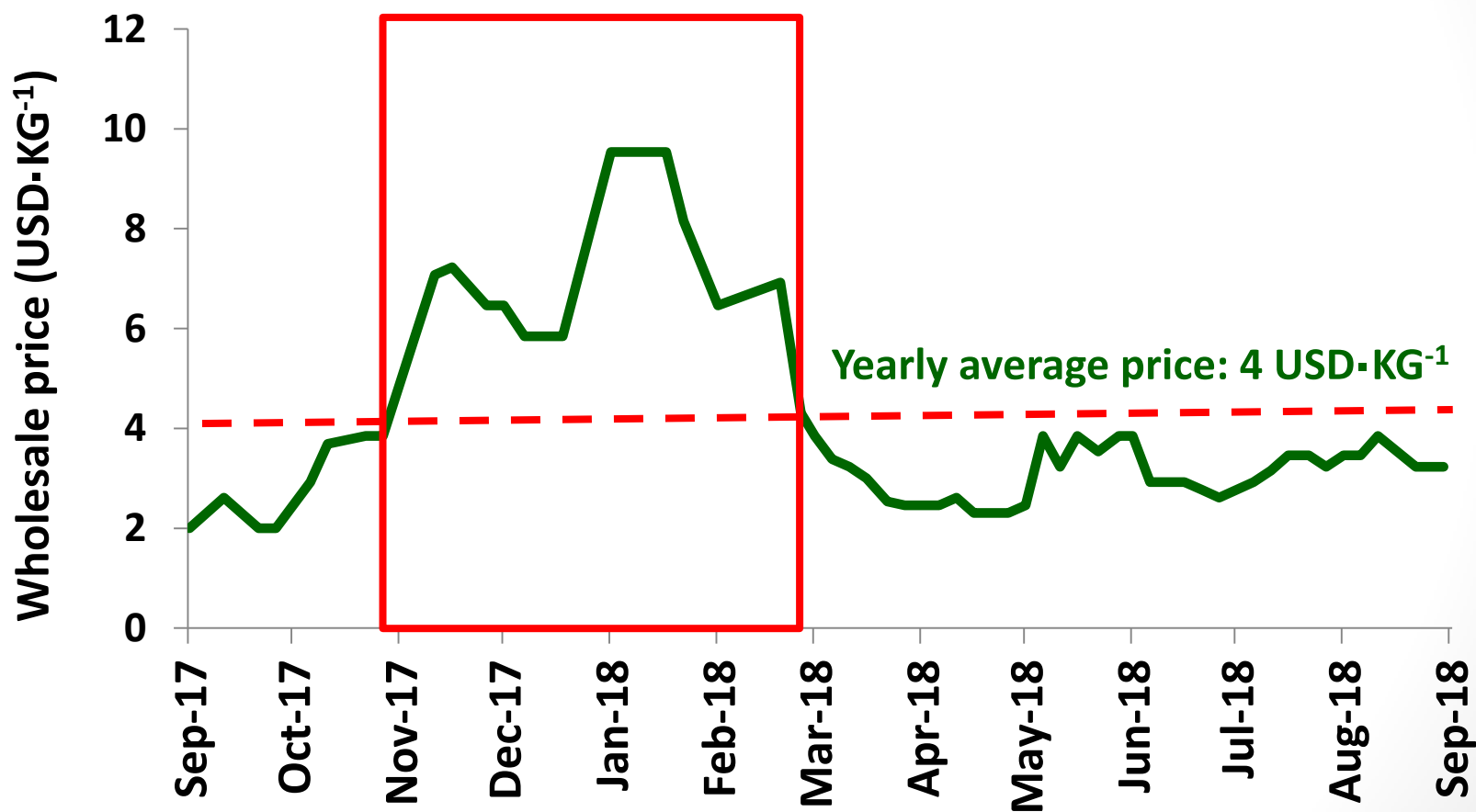


Southwest - Yanshan (104.35°E, 23.62°N)



Jan Feb Mar Apr May Jun July Aug Sep Oct Nov Dec

# Fresh asparagus wholesale price in Beijing, China from Sept. 2017 to Sept. 2018



# Off-season culture



**Qingdao**  
**(120.38°E, 36.07°N)**



**Hangzhou**  
**(120.19°E, 30.26°N)**






**Yancheng (120.13°E, 33.38°N)**



# Earliness and yield of green asparagus under different types of plastic tunnels

- Location: Fuyang (119.96°E, 30.05°N)
- Variety: Atlas F1 for green spears
- Length of spears: 25 cm
- Year: 2004
- Harvest duration: Jan - Mar

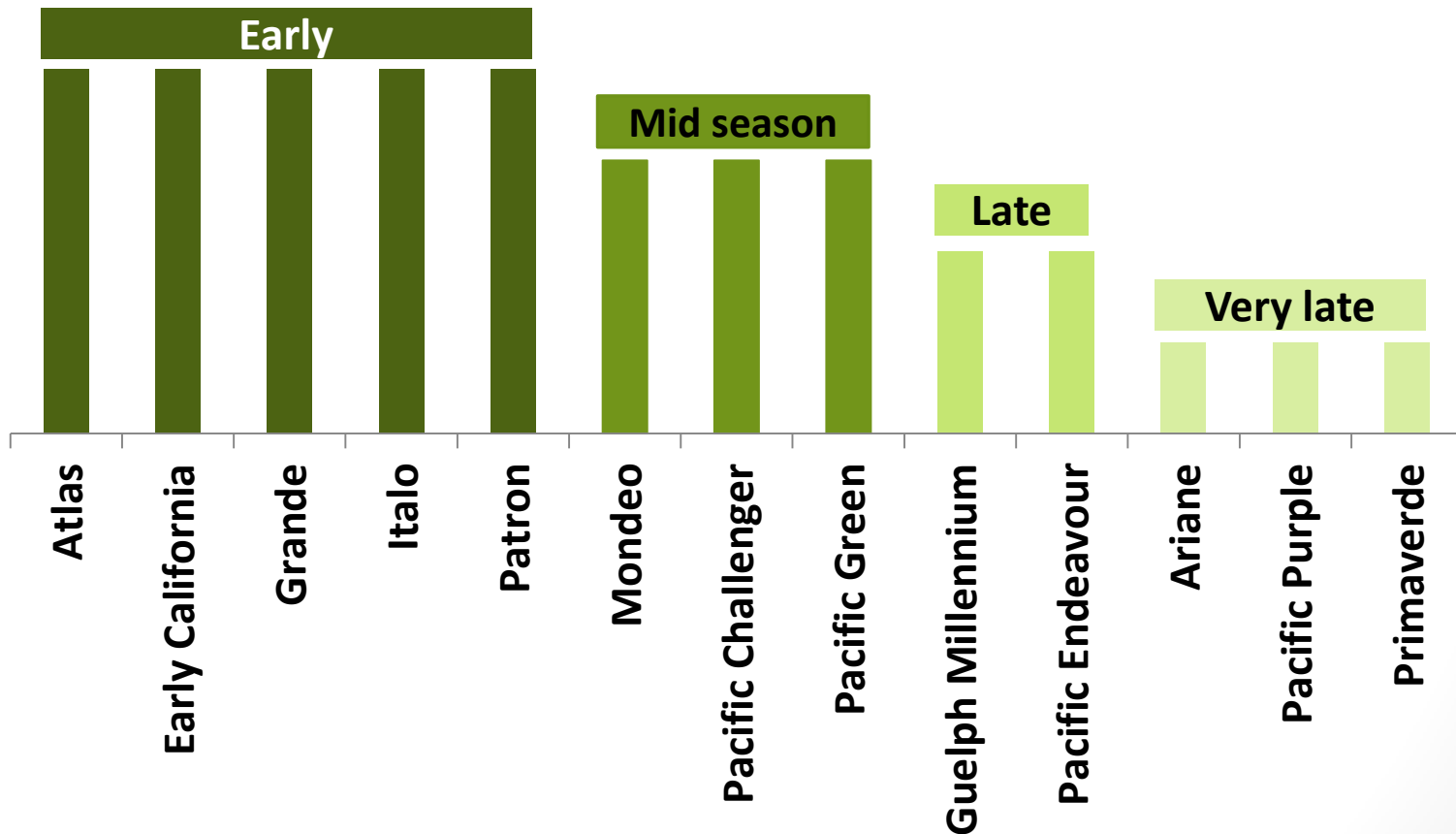
Type	Single layer	Double layers	Triple layers
			
Earliness	2 Feb.	19 Jan.	15 Jan.
Yield (t·ha <sup>-1</sup> )	6.25	7.50	9.67

**55% ↑**

Date from: Liang *et al.* (2010)

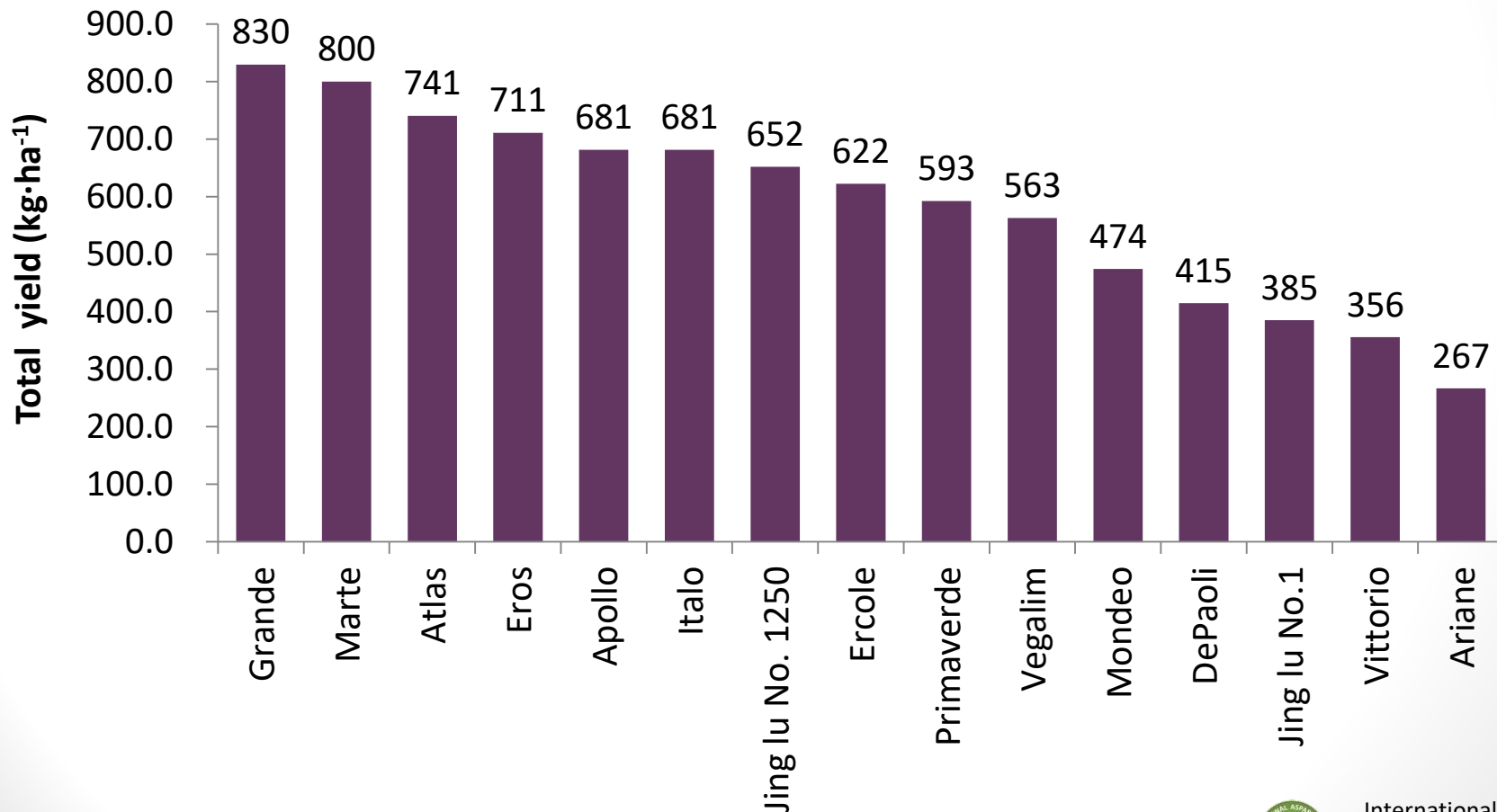
# Growers are looking for early varieties

## Earliness of different varieties in Hangzhou, China



# Yield of green asparagus grown in open field in Northern China

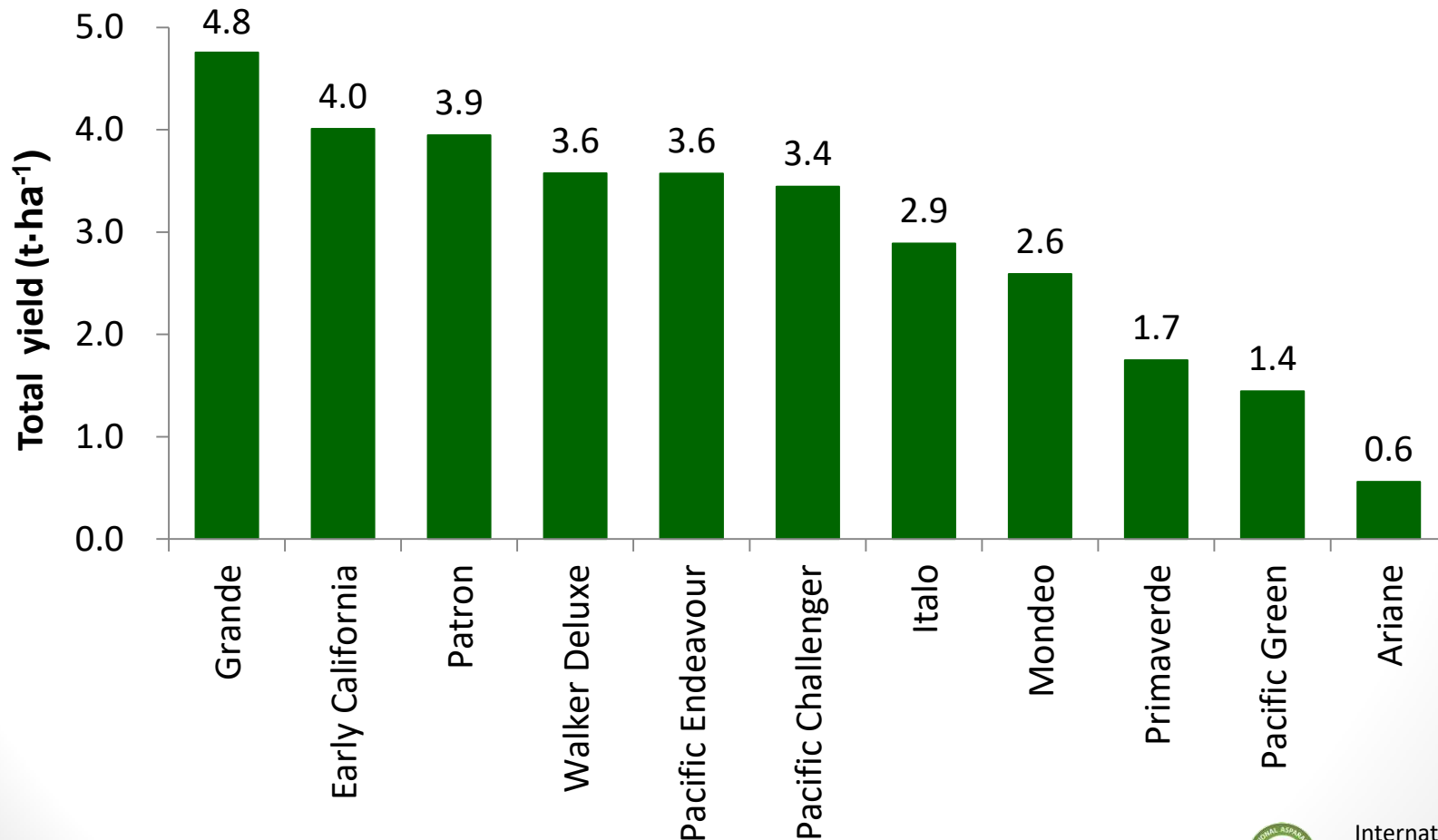
- Location: Yuncheng, China
- Time of harvest: Spring, 2018 (first harvest)
- Duration of harvest: 9 days
- Length of harvested spears: 27 cm





# Yield of green asparagus grown in plastic tunnels in Southern China

- Location: Hangzhou, China
- Time of harvest: Spring, 2017 (first harvest)
- Duration of harvest: 21 days
- Length of harvested spears: 37 cm



# 'Grande' - one of the best yielding foreign varieties

**Characteristics of seven asparagus varieties in Putian, China (2014 - 2016)**

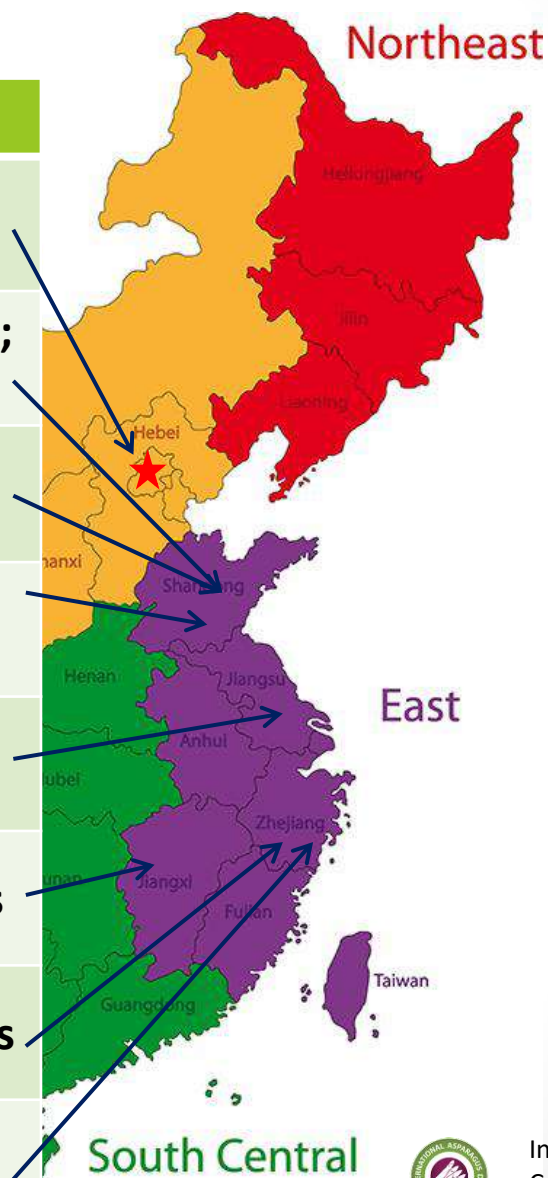


Variety	First branching height (cm)	Diameter of stems (mm)
De Paoli (US)	32.4	8.6
Gijnlim (NL)	29.3	9.1
Grande (US)	37.8	9.2
Jingang 701 (CN)	28.8	7.8
Jinglv No.1 (CN)	36.4	8.5
New Dynasty (CN)	31.1	8.3
Thielim (NL)	28.9	8.4

Date from: Yuan *et al.* (2017)

# Asparagus breeding in China

Institute / Company	Variety
1. Beijing Academy of Agri. and Forestry Sciences	Jinglv series
2. Shandong Huanong Agri. Sci. & Tech. Co., Ltd	Golden crown; Jade & Pearl
3. Weifang Academy of Agri. Science	Lulu series
4. Shandong Juxingyuan Group	Juxingyuan series
5. Jiangsu Dadihe Agriculture Sci. & Tech. Co., Ltd	Sulu series
6. Jiangxi Academy of Agri. Sciences	Jingang series
7. Zhejiang Academy of Agri. Sciences	Fengdao series
8. Hangzhou Jiahui Agriculture Sci. & Tech. Co., Ltd	Jialu series





# Important characteristics of new hybrids to be bred in China



**Anthocyan-free**



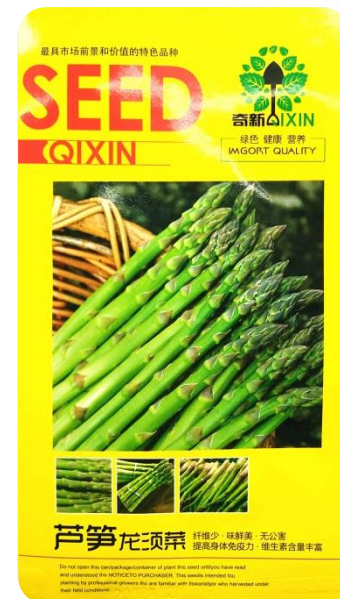
**Tall branching height**



**Strong tolerance to stem blight disease**

# Main challenges

## 1. Fake or F<sub>2</sub> seeds



International Asparagus Days  
Cesena, Italy  
October 16, 2018

# Main challenges

## 2. Diseases and pests



**Stem blight**  
(*Phomopsis asparagi*)



**Beet armyworm**  
(*Spodoptera exigua*)



**Crown and root rot**  
(*Fusarium oxysporum f.sp. asparagi*)



**Asparagus aphid**  
(*Brachycorynella asparagi*)



**Cercospora leaf spot**  
(*Cercospora asparagi*)



**Thrips**  
(*Thrips tabaci*)



**Asparagus rust**  
(*Puccinia asparagi*)



**Asparagus beetle**  
(*Crioceris quatuordecimpunctata*)

⋮  
**More**

⋮  
**More**



International Asparagus Days  
Cesena, Italy  
October 16, 2018



# Main challenges

## 3. How to apply 'mother-stalk' method

### Advantages:

- Maintain high yield
- Decrease the incidence of stem blight disease
- Increase output

### Problems:

- Harvest duration
- Number of mother stalks
- Distribution of mother stalks





# Thank you !

**Dr. Wenjing Chen**

wenjing@walkerseed.com

www.walkerseed.com



**WALKER**  
Brothers, Inc.  
Seeds and Plants



International Asparagus Days  
Cesena, Italy  
October 16, 2018