

**Bamboo Seeds  
&  
Ornamental Bamboos in China**

**for 9th World Bamboo Congress,  
Belgium**

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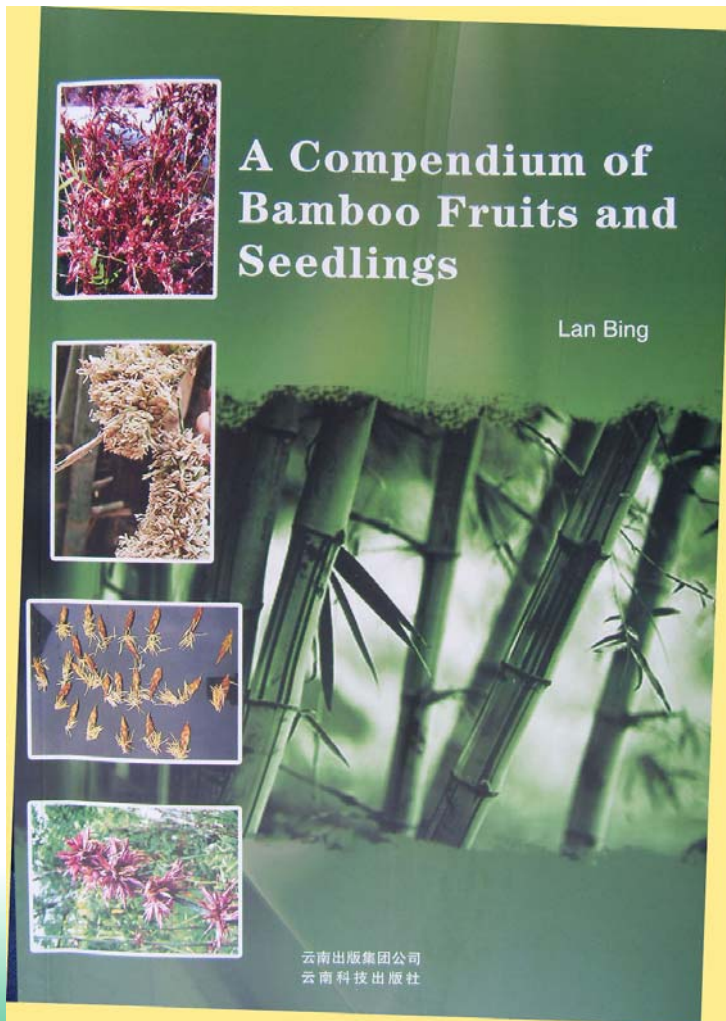
# 竹子果实的收集

## Collection of Bamboo Seeds



- 通过近30年的努力，我们收集到来自世界各地的竹子果实及图片，共计有30余属约260种，编著出版了《竹类果实苗木图志》，为竹类植物的科学分类奠定了基础。
- With efforts of over 30 years, we have collected bamboo seeds or pictures of bamboo seeds for up to 260 species and varieties in 30 genus, published the book 'A Compendium of Bamboo Fruits and Seedlings', which provides basic data for classification of bamboo

# A Compendium of Bamboo Fruits and Seedlings



- the 1st bamboo book focusing on bamboo inflorescence, fruits and seedlings

# 竹种形态

## Morphology of Bamboo Fruits

- 1- 梨果，如梨竹属，种子直径5-8cm，单粒重量达100克  
Pome, such as Melocanna, the seed is usually 5-8 cm in diameter, up to 100 grams in weight
- 2- 坚果，直径1-6 cm  
Nut, 1-6 cm in diameter. such as Melocalamus, Cephalostachyum, Ferrocalamus, Qiongzhusa, Chimonobambusa.
- 3- 颖果，大多数竹子果实属颖果，直径1cm以下  
Caryopsis, around 1000 bamboo species fall to this category. below 1 cm in diameter.





- *Malocanna humilis*

# Melocalamus arrectus

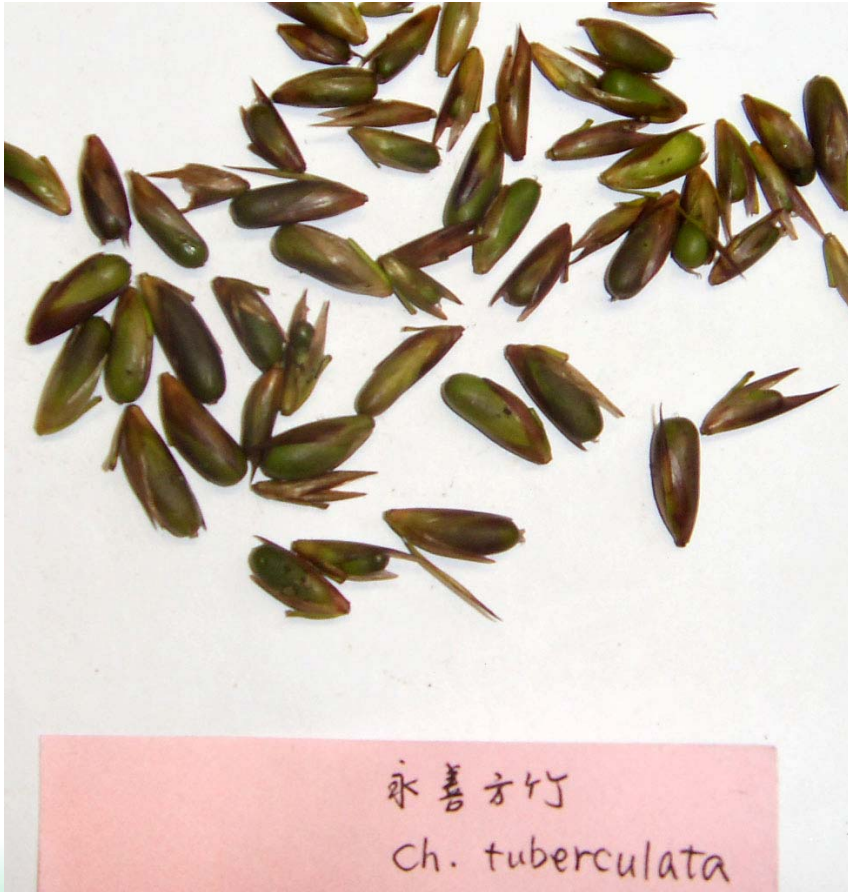


# Qiongzhuea tumidinoda



Qiongzhuea tumidinoda

# Chimonobambusa





# Chimonobambusa angustifolia



# Dendrocalamus



# Dendrocalamus



# Dendrocalamus



# Chimonocalamus



# Fargesia



moso



# Gigantochloa





# 竹子开花

## Flowering of Bamboo

- 1)竹子开花特点 Features of bamboo flowering
- 2)开花先兆 Indications of bamboo flowering
- 3)开花时间 Time of flowering
- 4)预防开花技术 How to prevent bamboo from flowering
- 5)促使开花技术 How to boost bamboo flowering
- 6)提高结实技术 How to enhance ripening rate





# 竹子开花特点

## Features of Bamboo flowering

- 大多数竹种开一次花即死，少部分竹种可多次开花而不死亡
- Most bamboos flower once only in the life span while a small amount of bamboo varieties flower several times in the life span and survive after flowering
- 风媒授粉 wind-pollinated (naturally)
- 授粉率低 (原因：雌雄蕊败育、雌雄蕊成熟时间不同、雌雄蕊不能授粉、不良气候、环境干扰等)
- low pollination rate - Reasons: abortion of pistil or stamen, different mature time for pistil and stamen, pollination inability, bad weather, environmental interference etc
- 花期长 long flowering interval



## 开花先兆 Indications of bamboo flowering

- 竹笋很少甚至不出笋 less or no shooting
- 叶绿素显著衰退，竹叶变为枯黄色或全部脱落 chlorophyll fading, bamboo leaves turn yellow or drop
- 换生短小变形的新叶 new leaves are smaller or deformed
- 竹子体内糖类物质增加和氮素含量减少 saccharide inside bamboo increases while nitrogen content reduces



# 开花时间

## Time of flowering



- 散生竹 3-6月 Mar. to June for runners
- 丛生竹 11月-次年3月 Nov. to Mar. for clumpers

## 预防开花技术

### How to prevent bamboo from flowering

- 去除老地下茎 Remove 3-year old or above subterranean stems in winter every two years
- 多施有机肥，松土30厘米 Apply organic fertilizer(1-2MT per Mu every 2 years) and loosen soil at 30cm
- 定期采伐老秆竹 Cut old bamboo culms(4-year or above for clumpers and 6-year or above for sunners) at ground level each year or every two years
- 防止病虫害 Prevent disease and insects
- 及时浇水排水 Water or drain off water timely according to weather condition



# 刺激开花技术

## How to Boost Bamboo Flowering

- 露出1/2地下茎，封顶修枝 Expose 1/2 subterranean stems, prune the top and branches
- 高温干燥 Create high temperature and drought: increase the temperature to 32-38 celsius degree for 6-8 hours every day, make saturation moisture of the soil below 30% and relative air humidity under 50%
- 少施N肥，多施P.K肥 Reduce amount of fertilizer N and increase fertilizer P/K, at 500-100 grams for one clump of 10-20 culms
- 注射或喷施植物激素 Inject or spray plant hormone, such as 100 ml cytokinin 6-BA or BT(500 ppm) per culm
- 注射3-5%的葡萄糖溶液 Inject 3-5% glucose solution



# 提高结实率技术

## How to Enhance Ripening Rate

- 开花竹秆移栽 Transplant flowering bamboo culms
- 风媒授粉 Wind-pollination
- 蜜蜂授粉 Bee- pollination
- 人工授粉 Artificial pollination
- 喷施植物激素 Spray plant hormone
- 喷施微量元素及肥料 Spray trace element fertilizer









# 竹种贮存

## Storage of bamboo seeds

- 1-6摄氏度冰箱、冰柜或冷库保存，种子水分不一样，存活期也不一样

Stored at 1-6 celsius degree, viability of seed differs according to moisture content of seed itself

- 1) 水分<10%，6-12个月，毛竹、细叶龙竹、牡竹、印度刺竹种子可存12-18个月

below 10%: viable for 6-12 months. *Ph. pubescens*, *D.membranaceus*, *D. strictus*, *B. arundinacea* viable for 12-18 months

- 2) 水分10-16%， 2-4个月  
10-16%: viable for 2-4 months

- 3) 水分16-25%， 15-30天  
16-25%: viable for 15-30 days

- 4) 水分>25%， 10-20天  
above 25%: 10-20 days



# 播种苗培育

## Propagation from Seeds

播种时间 Sowing time

种子处理 Treating seeds

播种方法 Sowing methods

苗期管理 Nursuring seedlings



# 播种时间

## Sowing Time

- 竹种随采随播，用温室或大棚确保发芽最佳空气温度和湿度

sow upon harvest of seeds, use green house or shade to maintain proper temperature and air humidity (25-35 centigrade, 80-90% air humidity)



# 种子处理

## Treating Seeds



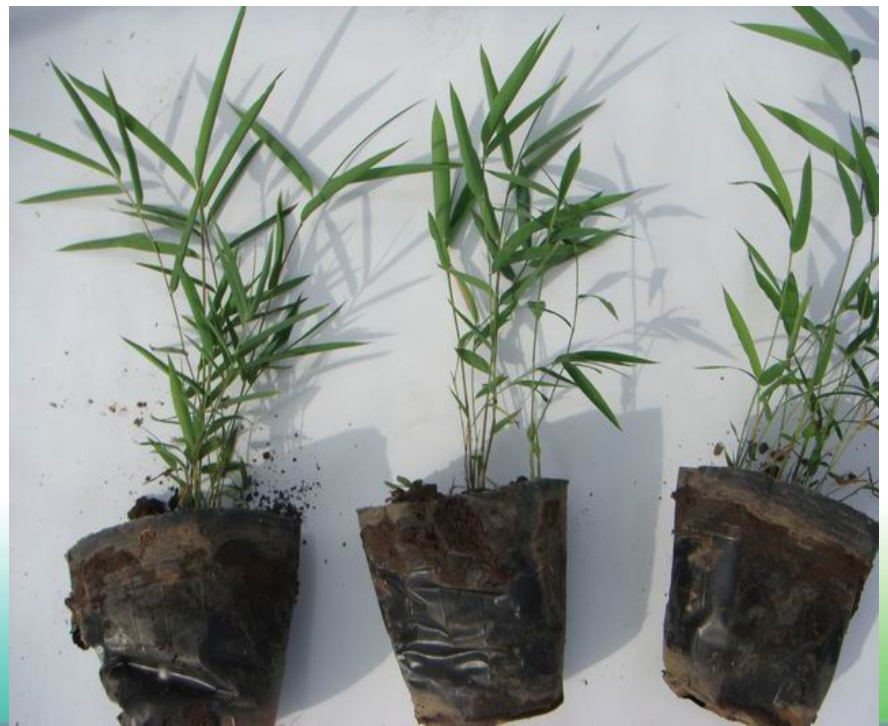
- 清洗种子 Wash the seeds
- 浸泡种子 Soak the seeds
  - a. 梨果：3-5小时  
3-5 hours for pome seeds
  - b. 坚果：12-24小时  
12-24 hours for nut seeds
  - c. 颖果：24-48小时  
24-48 hours for caryopsis seeds
- 催芽、杀虫杀菌，一般用IBA,GA  
Apply pesticide and fungicide, like IBA, GA

# 播种方法

## Sowing Methods



- 点播 -适用于梨果、坚果  
spaced sowing, applicable for pome and nut seeds
- 撒播 适用于颖果  
broadcast sowing, applicable for caryopsis seeds





- 第二部分 中国的观赏竹
- Part II: Ornamental Bamboos in China

# 观赏竹

## What makes bamboo ornamental?

观形 - nice and elegant shape

观秆 - deformed internodes, culm color

观叶 - biocolor of leaves

观地下茎 - nice shape of roots

通过同竹种异花自交、不同竹种杂交得到的种子培育出的竹苗，可以得到很多珍贵的观赏竹

variation from seeds - fertilization by flowers from different culms of the same species, or of different species makes seeds good propagation material for ornamental bamboo

# Acidosasa notata FMXG



Bambusa pervariabilis X Dendrocalamus latiflorus X B.  
textilis No. 1 FMXG



# Bambusa pervariabilis X Dendrocalamus latiflorus No. 7 EMXG



# Bambusa mutabilis Arb



# Bambusa pachinensis var hirsutissima SCBG



# Bambusa multiplex f. alphonso- karri





# Bambusa textilis var Purpurea SCBG



# Cephalostachyum fuschianum

## FMXG



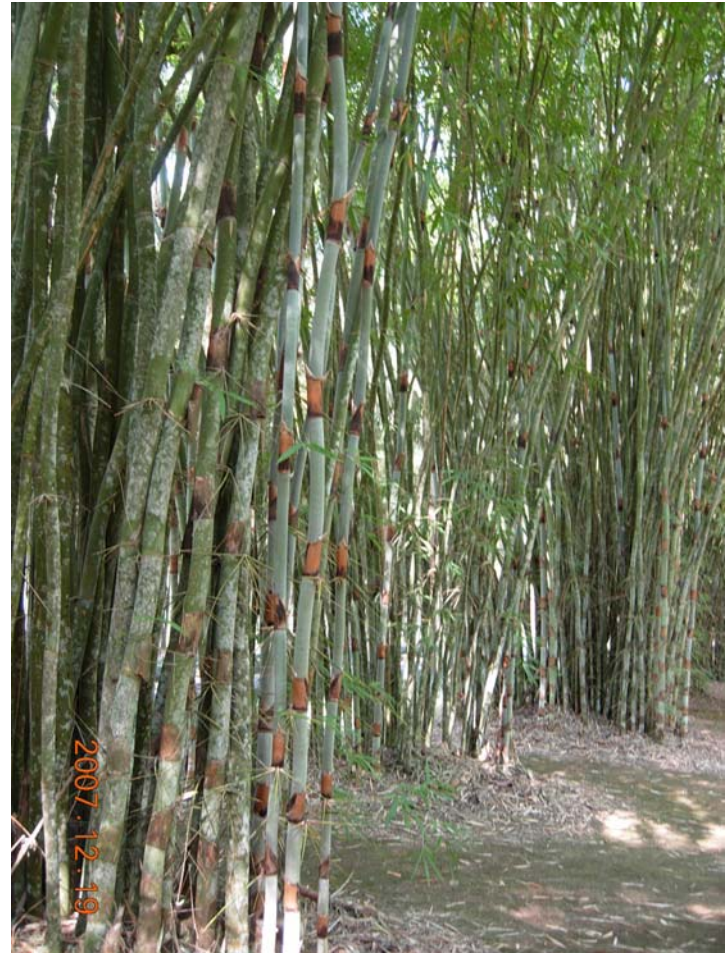
# Chimonobambusa pachystachys

## FMXG



# Cephalostachyum pergracile

## FMXG



# Dendrocalamopsis oldhamii



# Chimonobambusa yunnanensis

## Golden Temple



# Chimonocalamus delicatus FMXG



# Chimonocalamus dumosus FMXG





# Chimonocalamus makuanensis FMXG



# Chimonocalamus pallens FMXG



# Dendrocalamopsis stenoaurita

## SCBG



# Dendrocalamus bambusoides

## SCBG



# Dendrocalamus barbatus XTBG



# Dendrocalamus brandisii XTBG



# Dendrocalamus fugongensis FMXG



# Dendrocalamus sinicus







# Fargesia songmingensis FMXG



# Fargesia yuanjiangensis Gold Temple



# Indosasa acutiligulata

## Anji BG



# Indocalamus chongzhouensis FMXG



# Indocalamus decorus Lin'an



# Indocalamus guangdongensis

## SCBG



# Indocalamus latifolius FMXG





# Indosasa ingens



# Indosasa levigata

## Anji BG



# Indosasa shibataeoides

## Anji BG



# Indosasa sinica

## Anji BG



# Indosasa sp. white wax FMXG



# Oligostachyum lubricum Anji BG



# Phyllostachys heterocycla cv luteosulcata Anji BG

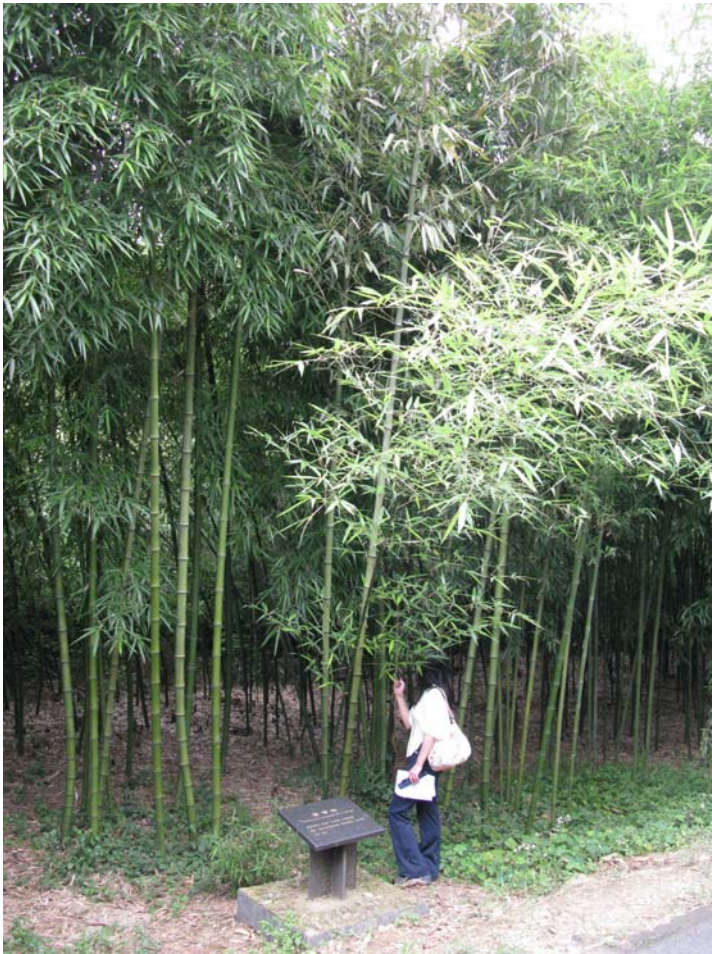


# Phyllostachys heterocycla cv Tubaeformis Anji BG





# Phyllostachys prominens Anji



# Pleiolobastus chino fm angustifolius

## Anji



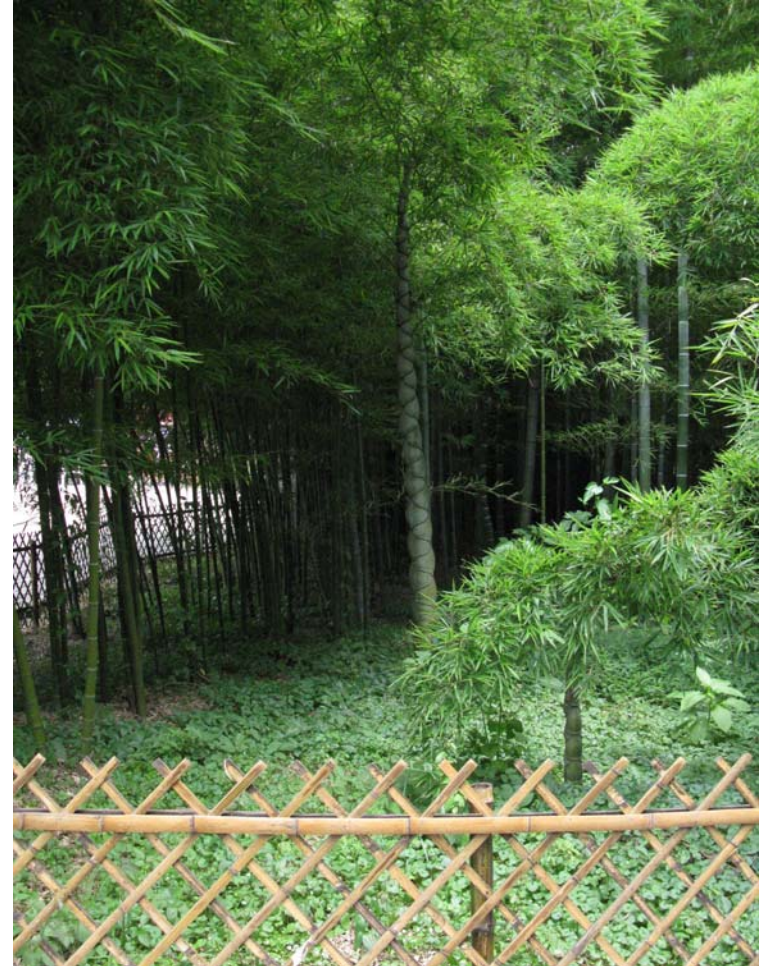
# Phyllostachy aurea



# Phyllostachys aureosulcata f. spectabilis



# Phyllostachys heterocycla (tortoise shell)



# Pleioblastus chino var hisauchi Anji



# Pleioblastus ovatoauritus Anji



# *Pseudosasa admirabilis*

## Anji BG





# Psuedosasa hindsii Anji BG



# Sasa argenteastriata Anji BG



# Qiongzhueta tumidinoda



# Sasa auricomma Lin'an



# *Sasa pygmeae* Lin'an



# Sasaella glabra f. albo-striata Lin'an



# Shibatea lanceifolia Anji



# Sinobambusa anaurira Anji





# Sinobambusa tootsik var. luteoalbo-striata



# Yushania songmingensis





***Thank you for your attention***

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