

Trees

for an Evergreen and Colourfull
Beijing

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Approach

Two approaches: Forestry & Horticulture

- different objectives, but same biology
 - Scale
 - Goals

Why Forestry?

Beijing is more than a mega-city of tall buildings. Also rural. We understand the importance of forests for environmental quality...but evergreen and color is just as important in rural landscapes

Forestry

- Great Wall is a good example of greening, forest restoration and restoring environmental quality. Success to date in establishing forest and shrub cover despite the degraded sites.
- **Species** for early establishment such as Platycladis and Robinia may not be the best in the long term either for productivity or esthetics (green all season)
 - Native vs. exotic species
 - Take advantage of huge diversity in NE China
 - What diversity?
- How to choose the best species to plant?
 - **Site** an important consideration especially water
 - **Plant hardiness /Climate**



Forestry

Tree improvement the selections process

- growth
- form
- wood quality
- Species & genetic selection for industry needs
 - fibre length
 - wood manufacturing
 - ecological restoration

Forestry

- We can now add aesthetic appearance
- Native species usually best for forestry; well adapted, no exotic invasive problems, pest resistance
- Programme of tree improvement : select from the genetic diversity of each native species
 - Undisturbed Cultural sites a source of diversity, adaptation and resistance
- Avoid mass-collected unimproved seed

Classic/Cooperative Tree Improvement

- Gather genetic diversity
- grow in a common garden; conduct provenance trials for the Beijing eco-environment; anticipate climate change/pollution & pest resistance; establish seed orchards; propagate with other methods
- Requires commitment, cooperation, science input (especially a geneticist); exploit trials to date
- Plan a diverse planting regime (Restoration of the native flora of NE China) as opposed to a garden of exotic species

Propagation

- Can use vegetative propagation (e.g. rooted cuttings) or tissue culture as you do for poplar e.g. but always starts with seed.
- Back to the seed orchard for controlled crosses to replicate what worked in the provenance trials

Horticulture

Horticulture selections for

- appearance and convenience
 - form
 - colour,
 - species selection for size (dwarf)
 - other attributes
- Cultivars have legal protection
- Thus can see how the horticulture and forestry worlds often did not meet.

- Native varieties again?
 - Asia has greatest species variety
- Selection for colour (blue spruce, rare genetic anomalies); propagation issues
- Purchase of exotic stock or license to propagate
- First decide on what the “look” should be, then find the species that fits

Crimson King Maple











Horticulture

- Size matters too big too small
- Messy (pine, ash) or clean
- Fast or slow growing
- Tolerant pollution, drought, temperature extremes
- Timing (flush, leaf fall, duration)

Sugar Maple (sM)



sM fall colours



sM variety of fall colours





sM Winter

















propagation

- Different species different requirements
- A specialized art
- Steps for Seeds: collection (timing) , cleaning, storage, stratification for dormancy,
- Also vegetative (rooted cuttings and grafting) and tissue culture
 - These are required to preserve varietal lines
 - Lines are often proprietary

The Real Challenges

The eco environment places limits

- Moisture
- Soils (nutrient rich but organics poor?)
- Air pollution
 - Limits but benefits
- Temperature extremes and the city effect

