



## Building the Case for Urban Tree Canopy Inclusion in a State Implementation Plan

### Planting Strategies for SIP Tree Planting

#### What is this factsheet about?

- This factsheet examines the question of planting strategies in a very large tree-planting program
- It is one of a series of short factsheets written to aid anyone considering the possibility of integrating tree-planting into a SIP

#### Why does it matter?

- A very large tree-planting program will need to decide its planting methods early
- Linked to planting method are questions such as costs, stock, timing, mortality, and oversight
- Anyone considering including tree planting in a SIP must recognize that will be difficult to plant high numbers of trees in a short time and keep the survival rate reasonably high

#### How does planting strategy affect SIP objectives?

- Planners of large planting programs must balance three major competing factors:
  - Tree survival and growth—the top priority for any SIP tree-planting program
  - Task scheduling—timelines must respect biological requirements
  - Labor and budget—limitations must be balanced with SIP objectives
- For high survival, one might think of medium-sized stock to be planted by careful—and carefully monitored—professionals, but the job would probably be expensive and slow
- For low cost, one might think of volunteers and small stock, but tree mortality rate would probably be high, project organization complicated, and supervision difficult

#### Which actual installation means will be appropriate?

- [Hand techniques](#) have a long history in urban and community forestry
  - These traditional techniques are easily mastered, and equipment is not costly
  - Work can proceed very quickly if small stock is being used: experienced hand planters can plant up to 1600 seedlings a day on a single site
  - Especially suited to sloped ground or individual plantings by volunteers
  - Good survival depends on [careful techniques](#)
- [Machine-aided planting](#) is a common municipal and landscaping approach
  - Many different large machines are used (backhoe, [tree spade](#), etc.)
  - Typically employed for saplings and young trees
  - A power auger with a depth control is an attractive option for SIP planting
    - Used either hand-held or attached to a tractor, skidsteer or similar machine
    - Typically used with branched liners
    - Can be [fast](#) (2000/day) and have [high survival rates](#)
    - Requires trained operator plus small ground crew
- [Mechanical planting](#) might be suitable for community forestry planting in this context
  - Large numbers can be planted at a time
  - Best used with conifer seedlings
  - Survival rates may be low, but will be higher if a ground crew accompanies machine
  - Some sites (e.g., transportation corridors) might be well suited
- Most SIP planting programs will probably need to use all three means
  - Planting very large numbers in a short time will require non-traditional approaches
  - Means will have to be matched to site, stock, and available personnel

### **How can the most serious planting errors be reduced?**

- Bad planting technique accounts for most young tree mortality during the establishment period (first 3-5 years after transplanting)
- Common planting mistakes have fatal implications
  - Allowing pre-planting stress—roots dry out during transportation, [storage](#), and staging
  - [Planting too deep](#)—roots below grade, especially on clay or wet soils, suffocate and die
  - Leaving ties, wires, synthetic bags, or circling roots—stem girdling leads to root death
  - Failing to make proper soil-root contact—roots quickly die when exposed to air
- Mitigation of planting mistakes
  - Training—all personnel should be taught specific field techniques
    - Cover stock during transportation/storage, keep rootballs shaded during staging
    - Plant stock on undisturbed base with primary lateral roots at grade, except on [wet sites](#) where stock should be planted above grade
    - Cut any restriction to root growth before planting
  - Monitoring—both volunteers and professionals need oversight
    - Spot-check new volunteers' work so they can learn correct procedures
    - Set up [check system](#) and penalties in contracts with professionals
- Reducing the incidence of these mistakes will greatly improve tree survival, growth and condition—and so help attain the air quality benefits claimed in the SIP

### **What post-planting care is important?**

- Because of the large scale of SIP tree planting, it will probably be necessary to omit some techniques commonly recommended for post-planting care of community trees
  - [Watering](#)
    - Beneficial during establishment
    - Difficult and expensive in large project
    - Select drought-tolerant species to reduce long-term water needs
  - [Staking](#)
    - Costly, both for installation and removal
    - Unnecessary for smaller stock in most situations
    - Helpful in some locations to protect the planting site
  - [Fertilization](#)
    - Costly for this number of trees
    - Can aid establishment on poor soils if weeds are suppressed and slow-release products are used
- Some techniques will be easy to implement and make a great difference on survival
  - [Mulching](#) can be done quickly and brings large number of benefits
  - [Weed control](#) is critical for trees planted in semi-wild areas

### **What special planting techniques should be adopted for poor-quality sites?**

- Careful [species selection](#) will be the most cost-effective for large projects
- Good tree growth is possible on poor-quality sites such as [brownfields](#), [mining spoils](#), or [wetlands](#)
- For large-scale SIP programs, planting on such sites should be carefully evaluated from the perspectives of cost-benefit and resource analysis before being included

### **Where can more help be found?**

- Detailed websites about planting methods for [urban](#) and [rural](#) locations can be helpful
- Large tree planting programs with good survival rates such as that of the [Sacramento Tree Foundation](#) or [Trees Forever](#) often contain useful advice

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