

PNW 667

CHERRY

training systems

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A Pacific Northwest Extension Publication

OREGON STATE UNIVERSITY ■ WASHINGTON STATE UNIVERSITY ■ UNIVERSITY OF IDAHO

in cooperation with MICHIGAN STATE UNIVERSITY



SUPER SLENDER AXE (SSA)

Recommended spacing

Between rows	
on dwarfing or semi-dwarfing rootstocks, e.g., Gisela 3 or Gisela 5	10'
on semi-vigorous, precocious rootstock, e.g., Gisela 6 or Gisela 12	11.5'
non-precocious, vigorous rootstock	not recommended
Between trees	
dwarfing rootstock	20"
semi-vigorous rootstock	40"

The Super Slender Axe (SSA) was developed as a modification of the spindle to gain greater control of tree growth. The SSA needs dwarfing and precocious rootstocks such as Gisela®5 and Gisela®3. In the case of low vigor sites or self-fertile varieties, it may be possible to use more vigorous precocious rootstocks, such as Gisela®6 or Gisela®12. Varieties with good vigor, upright growth habits, and the ability to produce lateral shoots are preferred. The most important characteristic for a suitable variety is the capacity to produce fruit on basal buds of 1-year-old shoots.

The production habit of this system is significantly different from other systems. Instead of producing fruit on spurs with multiple small flower buds, SSA utilizes the solitary large flower buds at the base of 1-year-old shoots. This results in a favorable fruit/leaf ratio that yields very good fruit size and quality. The low production capacity per tree is compensated by the high planting density.

STAGE: *At planting*

GOALS

- **Promote strong root system establishment in the first growing season**
- **Impose bud-activation techniques to stimulate extensive lateral shoot formation**

SSA TREE SELECTION

- Nursery trees should have a height between 40 and 50 inches above the graft union (Figure A). It is important that the trees have short internodes, preferably with strong buds well-distributed from the middle through the apical part of the tree.
- Bench-grafted, 6- to 8-month-old trees with a height of 30–40 inches also are suitable (Figure B).



Figure A

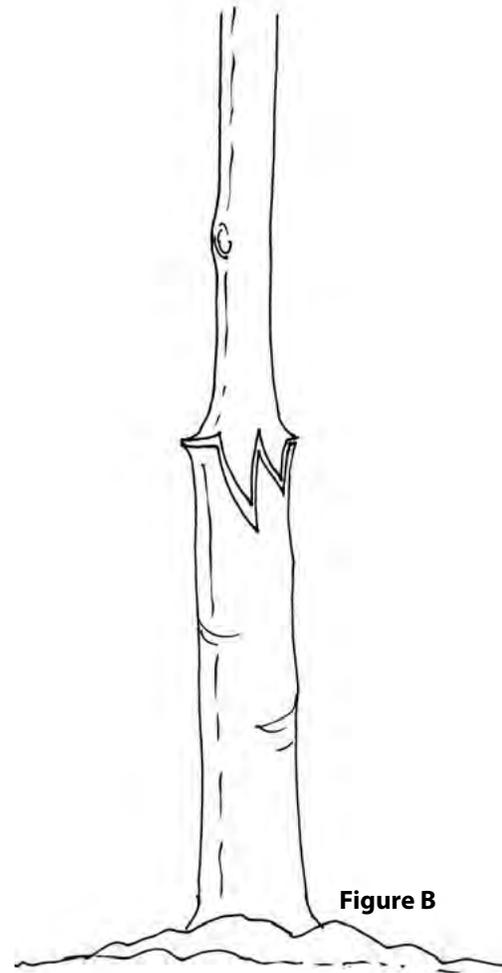


Figure B

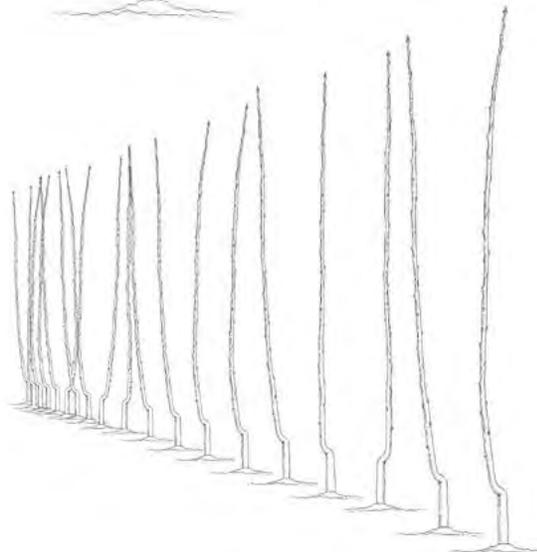
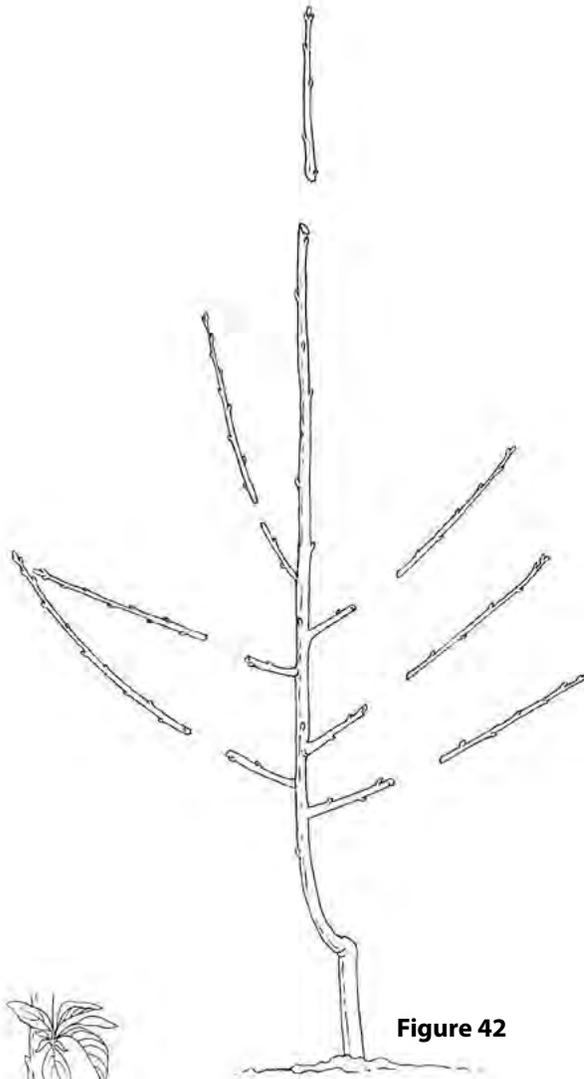


Figure C. A newly planted SSA orchard. Note the absence of feathers.

STAGE: *At planting*

SYSTEM DEVELOPMENT

- If feathered trees are planted, the terminal is removed to enhance shoot growth and feathers are cut back to two or three vegetative buds (Figure 42).
- It is critical to induce 10 or more lateral branches on the leader during each year of canopy development. This can be done via girdling of the trunk or application of a cytokinin-gibberellin growth regulator (e.g., Promalin), at green tip; bud removal is NOT recommended (Figure 43).



STAGE: *First growing season*

GOALS

- **Develop at least 75 percent of the final leader height**
- **Develop 10 or more well-distributed lateral branches with relatively uniform moderate vigor, which will provide shoot basal fruiting capacity in the second year**

SYSTEM DEVELOPMENT

- When 3–4 inches long, the more upright-growing lateral shoots can be adjusted to horizontal crotch angles by attaching a clothespin at a 90-degree angle to the trunk just above the shoots.
- Clothespins can be removed after 2–3 weeks, or re-set to just behind the shoot tip to help keep the shoot from turning upwards.
- Figure 44 illustrates the type of desired lateral shoot activation and growth at the end of first year compared to a tree with no bud activation (Figure 45).
- A high single-wire trellis may be useful for aligning the tops of the SSA trees.

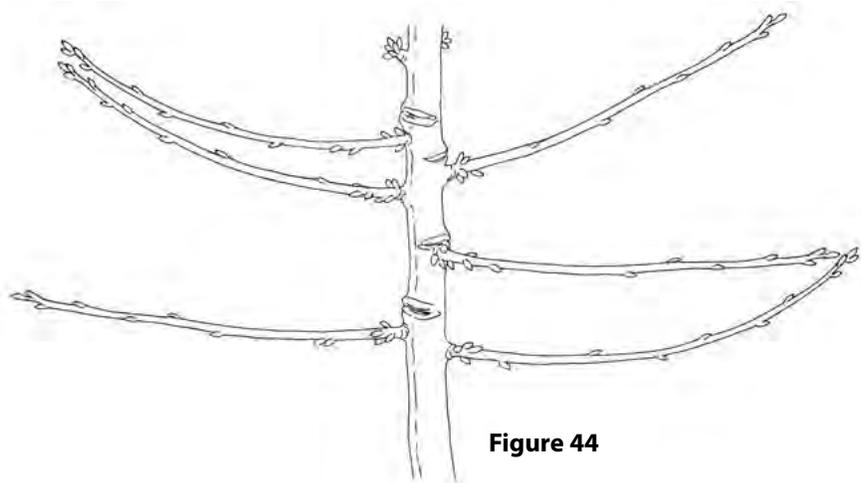


Figure 44

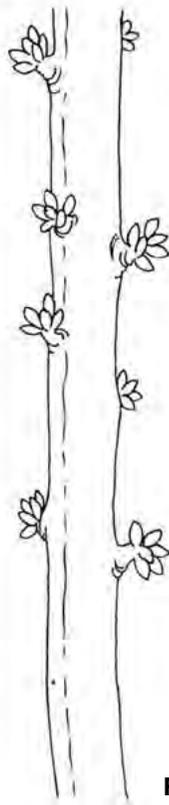


Figure 45

Figure 44 illustrates the type of desired lateral shoot activation and growth at the end of first year. Figure 45 illustrates a tree with no bud activation.

STAGE: *First dormant season*

GOALS

- **Impose bud-activation techniques to stimulate additional extensive lateral shoot formation on leader.**
- **Begin “short-pruning” of existing lateral shoots to simultaneously balance leaf area with second-year crop load and renew or initiate new fruiting laterals.**



Figure 46a



Figure 46b

SYSTEM DEVELOPMENT

- SSA “short-pruning” is done by removing the majority of the length of each 1-year-old (previous season) shoot, retaining only the basal flower buds plus at least two vegetative buds for new shoot formation (Figure 46a). Lower branches can be left slightly longer than upper branches.
- Short-pruning may be accomplished best during bud swell, when it is easier to differentiate between the rounded flower buds and the more pointed vegetative buds (Figure 46b).
- When leader extension has been moderate, bud activation steps can be taken (as described above) to induce another 10 or more lateral branches on this leader growth, repeating as needed until the full tree height is achieved.

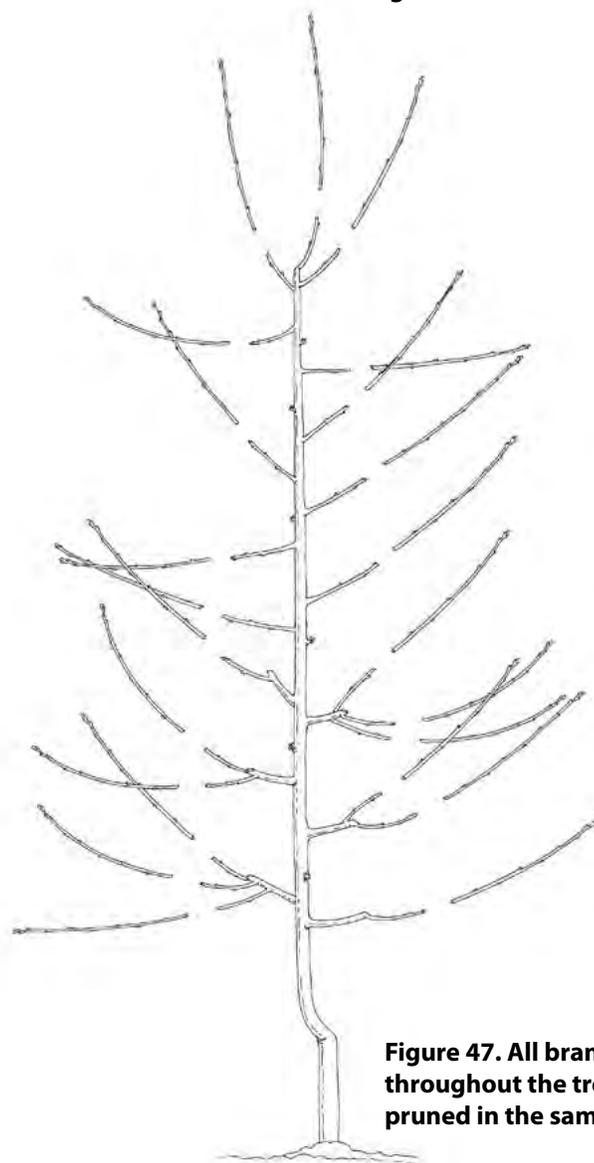


Figure 47. All branches throughout the tree are short pruned in the same manner.

STAGE: *Second and subsequent growing seasons*

GOALS

- **Achieve final leader height in the second year**
- **Complete formation of well-distributed lateral shoots on 75 percent of the leader in the second year and on 100 percent of the leader in the third year**
- **Begin cropping in the second year, achieving full production by the fourth and fifth years**
- **Maintain permanent canopy height without invigorating the tree top**

SYSTEM DEVELOPMENT

- When 3–4 inches in length, the more upright-growing lateral shoots on the leader can be adjusted to a horizontal crotch with clothespins.
- Once the leader has reached its mature height, it should be headed back to a relatively weak lateral shoot just below the preferred mature height, either done at a delayed budbreak timing (4–5 weeks after budbreak) or postharvest (mid-summer) to minimize regrowth.

STAGE: *Second and subsequent dormant seasons*

GOALS

- **Impose “short-pruning” on all lateral shoots to achieve 100 percent annual renewal of all fruiting laterals**
- **Maintain balanced and moderate vigor and fruitfulness throughout canopy**

SYSTEM DEVELOPMENT

- Every “fruiting feather” is short-pruned annually, leaving two to three vegetative buds for leaf area renewal plus the basal flower buds for cropping (Figure 48); feather length should decrease slightly from canopy base to apex (Figure 49).

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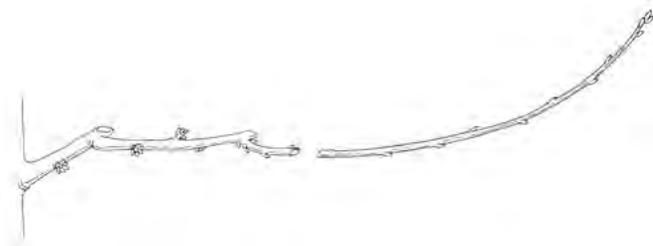


Figure 48

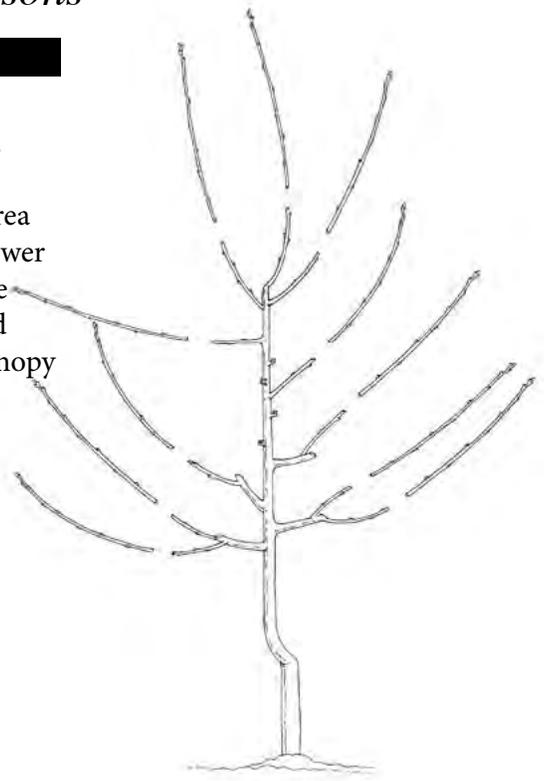


Figure 49

STAGE: *Second and subsequent growing seasons (con't)*

SYSTEM DEVELOPMENT

- Short pruning maintains the production close to the central leader (Figures 50a and 50b).

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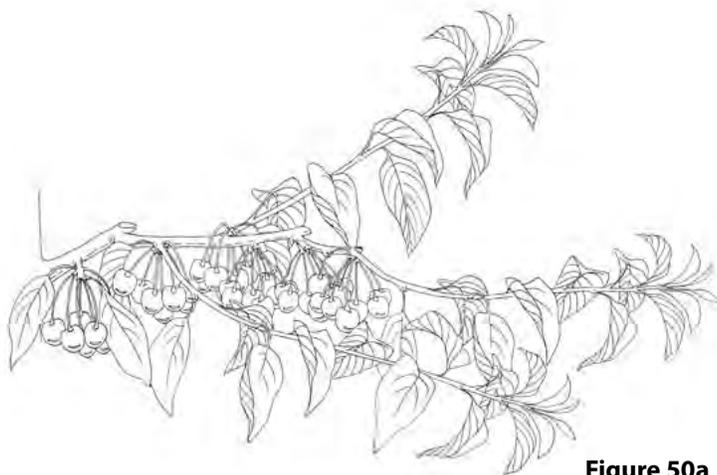


Figure 50a



Figure 50b

STAGE: *Second and subsequent growing seasons (con't)*

SYSTEM DEVELOPMENT

- When fruiting feathers become too long, they can be removed with a short stub to promote renewal of shoots close to the leader (Figure 51).
- On SSA trees, flowering (Figure 52) and cropping (Figure 53) should occur primarily on basal buds of 1-year-old shoots throughout the life of the orchard.

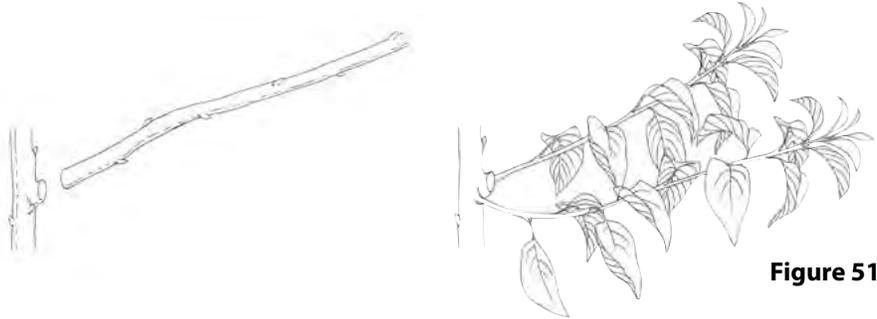


Figure 51

SUMMARY

The SSA training system produces a high-density orchard of central axis trees with short limbs and fruiting primarily on 1-year-old shoots. Renewal of nearly 100 percent of the fruiting units is accomplished with annual dormant pruning. All operations, such as pruning and harvest (approximately 80 percent), can be managed from the ground. A limitation of this system is the inability of specific cultivars to form fertile basal flower buds; therefore, this trait must be evaluated for each potential cultivar to be considered.



Figure 52

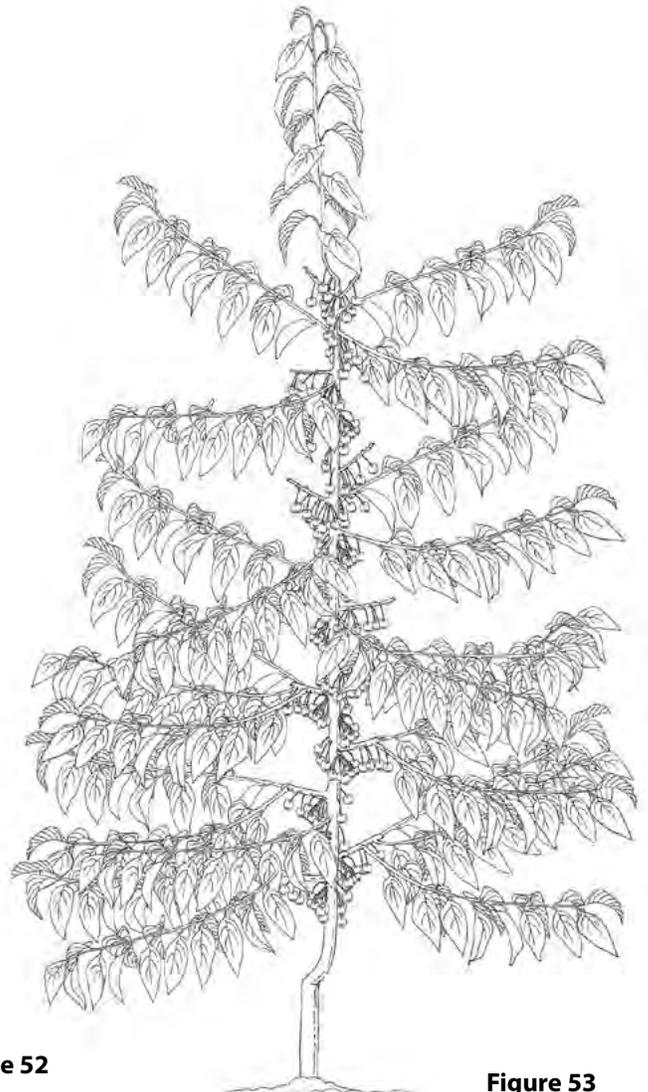


Figure 53