SILVICULTURE

Juvenile Spacing

A Guide for Forestry Crews

Province of British Columbia

Ministry of Forests

Safety First

Powersaw spacing is a dangerous occupation. A few basic precautions will reduce the chance of serious mishaps.

Always:
• carry a safety whistle and
  a compress bandage;
• know the location of the
  first aid kit and stretcher.

Do not:
• work alone;
• raise powersaw above
  waist level; or
• traverse rough terrain with
  powersaw running.

Check:
• position of adjacent spacers;
• unstable footing ahead;
• chain condition (period-
  ically); and
• for potentially dangerous
  situations such as snags,
  wasp nests, etc.

Supervisors and crew members are urged to consult the following literature, which should be available from each District office: Fallers and Buckers Handbook, Ministry of Forests Safety Manual 10.63, and Role of Supervisors in Accident Prevention.

Fire Protection

Crew members must:
• refuel only at designated clearings;
• carry a personal fire extinguisher;
• smoke only in designated areas;
• ensure saw-muffler is adequate;
• be aware of fire equipment locations each day; and
• obey all fire prevention regulations.

General

This brochure is designed only to introduce potential spacers to juvenile spacing. Further details concerning this forest management technique, safety, equipment needed, fire regulations and bidding procedures are available at either the Regional or District offices of the B.C. Ministry of Forests. Consult your local telephone directory for the number and location of your closest District office.

Use the Correct Equipment

① reliable powersaw or brushsaw;
② gloves;
③ steel-toe boots;
④ safety pants;
⑤ hardhat;
⑥ durable rainclothes;
⑦ ear protectors;
⑧ goggles or visors;
⑨ tool kit;
⑩ gas and oil containers;
⑪ measuring line; and
⑫ aerosol fire extinguisher.

Have:
- reliable transport;
- required fire-fighting equipment;
- drinking water containers;
- spare powersaws and parts; and
- WCB-approved first aid kit and stretcher.

General Rules

- stump height less than 30 cm and cut below the lowest live branches;
- cut should be parallel to the ground;
- all stems cut cleanly — no "hinges";
- accidentally damaged trees must be cut;
- cut trees should not lean on crop trees;
- all conifers, other than crop trees taller than one metre, must be cut;
- cut small stems, then large ones;
- generally, all woody vegetation competing with crop trees cut back at least one metre; and
- reduce spacing by 50 percent around natural openings, old skid trails and roads.

Quality Check Procedure

To ensure that the correct number of stems are left on each hectare spaced, one check plot of 100 m^2 will be established by the Ministry of Forests for every two hectares spaced. The number and quality of trees within these plots are checked, and the frequency of infractions recorded. Poor-quality work may result in non-payment or a reduction in compensation, so ensure that contract conditions are met. Whenever in doubt, contact the Forest Officer responsible for administering this contract.

r = 5.64 m

Stocking Required

Average Distance Between Trees (m) Triangular Spacing	Number of Trees/Plot
2.5	16 - 20
3.0	12 - 14
3.5	8 - 10
4.0	6 - 8
4.5	5 - 6
5.0	4 - 5

A 10-percent variation is permissible in the number of crop trees specified within the contract agreement.

What is Juvenile Spacing?

Juvenile spacing is the cutting of undesirable trees within a young stand to allow the future crop trees sufficient space to grow relatively free of competition for water, nutrients and sunlight. The cut trees are usually not removed from the site, as they have no commercial value.

To ensure that the crop trees retained are free to grow, a predetermined distance is maintained between these selected stems. This average distance can be expressed as the average number of stems per hectare (sph) left after spacing. For example, a spacing of four metres, measured as a triangle, between trees will leave approximately 725 trees on each hectare.

Why Juvenile Space?

Each hectare of forest land can grow a certain maximum volume of wood. This capability is expressed as a site index. High site index land produces more volume than low site index land.

Within certain numerical limitations, juvenile spacing concentrates this maximum wood volume on fewer stems by increasing the size of each crop tree. These big trees reach a harvestable size earlier. Logging and milling costs are reduced, as the trees have more uniform dimensions.

Unspaced stand   20 years later

Spaced stand   20 years later

Spaced stands also provide good access to humans and animals, increase forage production, reduce the incidence of disease and allow the land manager to control the tree species composition.

Major Methods of Juvenile Spacing

Juvenile spacing may be done mechanically, chemically or manually. Ministry of Forests contracts in British Columbia are done almost exclusively by powersaw, and the following instructions relate to this method.

Juvenile spacing Technique

Crew Organization

- a crew usually consists of four to six workers;
- each member is assigned a working strip;
- average strip width of 10 metres varies with stand density — narrower in dense stands and wider in open stands;
- first strip should be marked through the stand and each successive strip run parallel to this;
- each member works a zig-zag pattern within the strip;
- faster worker in first strip, slowest in the last; and
- work uphill whenever possible.

Basic Crop Tree Selection

The largest stems closest to the desired spacing are identified, and the remainder cut. Severed stems should not hinder forward movement or inhibit further stem selection. Crop trees should conform to all criteria listed below, or a similar smaller stem selected.

Choose:
• the largest diameters;
• closest to the correct spacing; and
• those which are free of mechanical damage, insects and disease.

Look up to ensure:
• good tree form and vigour;
• the preferred species are selected; and
• disease or insect attack is identified.