

## 5.0 Factors that affect tree growth

### 5.1 Site quality and means to assess site quality

a. Factors that tell how rich or poor a site is for growing trees are:

- by feeling the exposed soil to see if it is rich or not
- the vegetation of the site, how healthy and strong it is
- if there are many species, then this is usually an indication that the site is richer in growth potential

b.

1. A simple forestry method is to measure the tree height at a given base age which is about 50 years in Saskatchewan. If site A produces a 25m tree and site B produces a 20m tree, then site A is a richer site because it produced an average growth height of 0.5m a year more than site B.
2. So if you planted Christmas trees on site A you would get your money back sooner than if you planted Christmas trees on site B.

### 5.2 Leader, terminal buds, lateral buds and apical dominance

**Leader** is the most recent growth of a tree and is at the top of the tree

- A tree grows from the top bud upward, so if a sign was nailed into a tree and the tree grew 30 cm that year, then that nail is still at the height that it was originally nailed at.
- Longer leader length indicates that there was a richer growing site.

**The terminal bud** is the last bud on a twig and will produce next year's growth.

It will grow straight up in the air and it usually opens earlier in the spring than other buds.

Tree **buds** grow against gravity and toward the light.

**Lateral bud** grows on the sides of the twig and will result in flowers and leaves in the next growing season

**Apical dominance** is the ability of the terminal bud to grow and stay ahead in growth and height compared to lateral buds.

- Conifers have the strong growth hormone responsible for this.
- If a terminal bud is somehow removed, two lateral branches will compete, which results in trees having two or more leaders.

### 5.3 Taper and Live Crown Length

- The tree's diameter gets smaller as we go up the tree and this is called **taper**.
- This taper challenges builders of log homes and saw mills.
- Factors which influence the amount of taper a tree has are:
  - a large amount of branches on the tree
  - how many trees a site can handle and its surrounding environment
  - genetics
  - stocking density
- Factors which help determine the diameter of a tree are:
  - crown length—or the amount of the tree covered with leaves that is able to photosynthesize
  - There is a direct correlation between live crown length and tree diameter. Because photosynthesis is a tree's way of producing food for itself, the more live crown length there is, then there is more food capable of being manufactured and therefore there will be more taper.

### 5.4 Live Crown ratio and its effect on tree growth

- Live crown ratio depends on the amount of trees growing on a forest site.
- So when trees are young, there are high numbers of trees on the site.
- As trees mature, the number of trees decline because of the type of species they are and because of the site that they grow on.
- The fewer the trees on site, the more space for each tree and therefore the longer the crown on a tree.
- Branches can grow longer which means more photosynthetic area to each tree.
- The tree that has the widest live crown width would have more taper because it would have a larger diameter growth each year.