

# Sainfoin In Alberta.

## Bulletin 4: Sustainable Life Cycle Productivity

### Yield Expectations

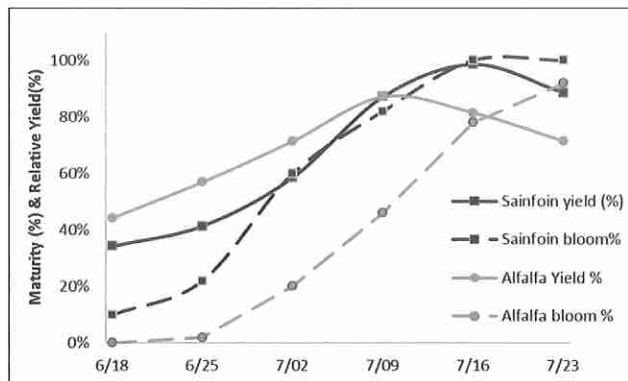
Dry matter yields of pure sainfoin fields vary but have exceeded 6,000 kg/ha on dry land (five year averages) in southern Alberta. The production on irrigated fields can be double the dry land yields.

- Yields from small plot trials are often double those of nearby field trials.
- Yields often exceed comparable stands of alfalfa during the first three years in the life of a stand.
- Total annual yields trend downwards with early first harvest (grazed or cut), increasing numbers of harvests during the growing season, and stands over three years old.
- Many studies have been published that compare yields and persistence of sainfoin with other forage legumes and mixtures. It is important to seed sainfoin at rates discussed in Bulletin 1 and to permit sainfoin to set seed periodically to encourage stand persistence.

Average yields of sainfoin/grass mixtures are always lower than those reported for comparable pure stands, generally in the range of 50 – 60 % of a pure stand.

- Sainfoin in mixed row seedings with creeping rooted grasses are less successful than those with bunchgrasses. Alternate row seedings generally yield better than mixed row seedings.
- Sainfoin in mixtures with other legumes yielded more than sainfoin/grass mixtures but less than sainfoin in pure stands.

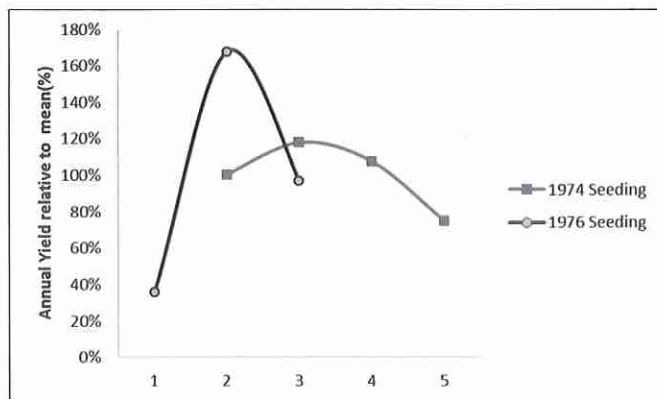
Sainfoin matures earlier in the growing season than alfalfa maximizing its dry matter yield at full bloom.



**Figure 1** Cumulative yield and relative maturity of irrigated sainfoin and alfalfa (after Carleton et. al., 1968)

- After growth starts in the spring, sainfoin depends on leaf carbohydrate capture to achieve its maximum yield. It delays restocking root TNC's (Total Non-structural Carbohydrates) until after full bloom. Harvest by grazing or cutting should remove no more than 70% (12 cm stubble height) during this period.
- Second or final harvests (grazing or cutting) should be delayed until after seed set (full bloom).
- Newer cultivars may mature at rates comparable to alfalfa

Sainfoin yields better in the first few years post seeding than in the year of seeding or subsequent years.



**Figure 2** Annual yields of sainfoin (relative to the mean) for two seedings, at Lethbridge, AB. Year 1 is the year of seeding. No data for 1974 year of seeding. Average yields were 1974=8,880 kg/ha; 1976=8,305 kg/ha (data from Hanna, 1980)

- With proper establishment, seedling year yields should be 25% of the initial five year average. With good management, long term yields should average 30%-60% of the initial five year average.

- Weevils and aphids will attack alfalfa but not sainfoin. Lygus will attack both species.
- Sitona weevil larvae scarred sainfoin roots in Montana studies, resulting in fungal infection.

Sainfoin yields are affected by several root diseases:

- All cultivars tested were found to be infested with and susceptible to Fusarium crown and root rots in northern Alberta field plots and greenhouse trials. Plant age was correlated with greater infection.
- Montana and Wyoming research implicated root knot nematode damage related to subsequent root fungal infections. 'Shoshone' sainfoin was selected for resistance to the nematode.

## Other Factors Affecting Yield

### Pests and Disease

Drought, lack of fertility, a tendency to overharvest, exceeding the limits to production imposed by environmental conditions, and stand age, are common reasons for reduced productivity. Sainfoin yields are reduced by a lack of moisture or inadequate fertility, but the plants will survive severe drought.

Several insect pests have been found in sainfoin:

- The sainfoin seed chalcid larvae feed on seed and overwinter in the seed pod. Chemical control is necessary only if the field is infested and will be harvested for seed.