

Barley – *Hordeum vulgare*

Barley is an important cool season cereal crop grown primarily for its grain, but it also produces valuable forage that can be grazed, cut for hay or silage while still green, or cut after grain harvest as straw. The widespread use of barley forage for feeding purposes is relatively new. Whole plant silage is now an important feed for ruminants as well as for other species.

Barley is a universal cereal and can grow in a wide range of climates under irrigation or dryland production, however it is best suited to cooler drier regions with rich, well-drained, loamy soils.



Strengths

- Quick germination, and rapid growth allows it to out-compete weeds
- Early production of large amounts of biomass
- Tolerant of low fertility, high pH, and sandy soils
- Scavenges available nitrogen from the ground
- Easy control by both chemical and mechanical means

Limitations

- Deals poorly with waterlogged soils
- Susceptible to barley yellow dwarf virus



What can it be used for?

Hay: Barley plants are fed either green or as hay to livestock. During threshing the dry stalks and leaves are collected and used as cattle feed. The straw is used as roughage and bedding for livestock.

Cover Crop: Barley can be used as a winter annual cover crop, grown specifically to maintain cropland soil quality, fertility, and productivity. Barley also works well in mixtures with other temperate cereals or legumes.

Nurse crop: Barley has a relatively open canopy and upright posture making it a good nurse crop for the establishment of a forage or legume stand. It is less competitive than other small grains and uses less water when compared to other covers crops.

Forage: Barley can be grazed by livestock before seed-heads are produced. Barley can provide early season grazing as it is planted sooner than wheat. When used as feed, the grain should be ground or cracked to improve efficiency. Barley is considered a good source of carbohydrates and protein in livestock feed.

Production potential: Yields can vary from 3,2 t/ha to 4,0 t/ha for dryland production within a crop rotation cycle and 6,5 t/ha to 7,0 t/ha for production under irrigation. Crop yields are dependent on factors such as soil fertility, climatic conditions and frequency of utilisation.

Metabolic disturbances in animals on cultivated pastures:





Low risk of grain overload: Crushing of grain increases the likelihood of grain overload, because these processes result in quicker release of carbohydrates, thus resulting in fermentation in the rumen rather than normal digestion.

Establishment

- Climate:** A shorter growing period is needed with an average temperature of 15 to 17 °C during flowering. Barley can tolerate high temperatures but usually requires an annual temperature range of 5 to 27 °C during ripening.
- Moisture:** The seasonal water requirement for barley depends on a variety of factors such as the variety, targeted yield and crop management. Barley is a drought tolerant crop and requires 390 to 430 mm of rainfall for optimum yield.
- Soil:** Barley can be grown on a wide range of soil types however best results are achieved on fertile, deep loam soils with a pH of 6 to 7,5. Aluminium toxicity may occur on soils with a pH lower than 6, leading to poor growth. Compared to other small grains it is more tolerant to alkaline soil. Barley is sensitive to very wet conditions.
- Fertilization:** Fertilisers applied depends on the soil assessment. Nitrogen increases protein quality of the grain, which is desirable for feeding barley. Nitrogen should either be applied before or during planting. A split applications of nitrogen fertiliser on lighter sandy soils would be more beneficial than on heavier soils.





Topdressing is usually recommended more than 65 days after the emergence of the barley to avoid the danger of too much nitrogen levels in the grain. Adequate phosphorus and potassium together with accessible nitrogen are essential to produce high yields.

	N (kg/ha)	P (mg/kg soil)	K (mg/kg soil)
Requirement for establishment***	15-30	20-30	
Seasonal application (kg/ha)	15-30	Use removal rates	

*Fertilizer just after establishment (kg/ha)

**Selected rate should maximise profit

***Determined by production potential

Phosphorus (P) and Potassium (K) can be recycled back to pastures when grazed by animals. This is dependent on the grazing system and the type of animals used. Up to 40% of P and 90% of K can be recycled. It is however necessary to do annual soil analysis to determine the level to which recycling occurs. The difference should be fertilized.

Methods: To produce barley, the seedbed must be weed free, fine and very evenly prepared. An uneven seedbed causes irregular development of the crop leading to uneven ripening and quality. It is important that seeds are not planted too deep, as this could be detrimental to emergence of the seedlings. Seeds should be planted at depth of between 2.5cm to 5cm. Barley grows best in well-drained, fertile loams or light, clay soils in regions that have a cool, dry, mild winter. Adequate but not excessive moisture is preferred for establishment



Seeding rate:

	Rows			Broadcast
	Low potential	Medium potential	High potential	
Irrigation	50 kg/ha	50kg/ha	60-80kg/ha	75kg/ha
Dryland cover crop	50kg/ha	50kg/ha	50kg/ha	50kg/ha

Planting time: Barley is usually planted in Autumn. Earlier plantings generally have a higher yield potential.

Management

Utilisation: Barley is ready for harvest 60 to 120 days after sowing, depending on the variety used. It should be harvested as soon as it reaches 13% moisture content. In dryland production the crop must be swathed just before final maturity when the heads have lost their green colour and when the moisture content is below 30 %.

Resources

1. Department of Agriculture, Forestry and fisheries.2009.
<https://www.daff.gov.za/Daffweb3/Portals/0/Brochures%20and%20Production%20guidelines/Brochure%20Barley.pdf> (Access date 22 April 2020).
2. [Heuzé V.,Tran G.,Nozière P.](#) and [Lebas F.](#) 2015.*Barley forage*. Feedipedia, a programme by INRA, CIRAD, AFZ and FAO <https://www.feedipedia.org/node/432> (Access date 22 April 2020).
3. Grain SA. 2018. Malting Barley production in perspective.
https://www.grainsa.co.za/malting-barley-production-in-perspective24_08-2 (Access date 22 April 2020).
4. LNR/ARC. 2019. Guideline production of small grains in the summer rainfall areas.
<https://www.arc.agric.za/arcsqi/Documents/2019%20Production%20Guidelines/ARC%20SUMMER%202019.pdf> (Access date 22 April 2020).