

## SHORT COMMUNICATION

**Introduction of Exotic Barley (*Hordeum bulbosum* L.) for Potential Fodder and Disease Resistance Purposes in Uttarakhand****KC Muneem, KS Negi and SK Verma**

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The introduction of exotic germplasm has enriched Indian agriculture since time immemorial. India has a sizeable area under saline and alkaline condition and the crops cannot be grown successfully in such problematic areas. Therefore, the emphasis is given, for the introduction of germplasm having quality traits for value addition and also sources of resistance for various diseases, insects, pests and biotic stresses. One accession of *Hordeum bulbosum* having quality traits such as potential fodder and disease resistance was introduced in Uttarakhand Himalaya.

*Hordeum* L. belongs to the family Poaceae (Gramineae). *Hordeum* comprises nearly 32 species and 45 taxa. Some of the important species such as *Hordeum vulgare*, *H. spontaneum*, *H. bulbosum*, *H. murinum*, *H. pusillum*, *H. intercedens*, *H. euclaston*, *H. flexuosum*, *H. muticum*, *H. chilense*, *H. cordobense*, *H. sterostachys*, *H. jubatum*, *H. comosum*, *H. lechleri*, *H. procerum*, *H. arizonicum*, *H. halophilum*, *H. seelinum*, *H. capense*, *H. bogdanii*, *H. roshevitzii*, *H. marinum*, *H. brevisubulatum* and *H. brachyantherum* are recorded in the literature (Roland *et al.*, 1991).

Among above cited species of barley, *Hordeum vulgare* is widely cultivated throughout mountainous region of Himalaya including Uttarakhand. In 1996, *Hordeum bulbosum* (EC328175) was received from Russia at NBPGR Regional Station, Bhowali, Uttarakhand, along with other exotic barley collections for characterization, seed increase, maintenance and acclimatization.

Plant has luxuriant and vigorous growth (150 cm to 178 cm); culm is erect to some what geniculate; nodes are glabrous, pale sometimes brownish; basal internode bulbous, 1-4 bulbs per culm, ellipsoid, ovoid, sometimes pyriform; lowermost bulbs usually well developed 2-3 cm x 1-1.5 cm; leaves flat; flag leaf-18.5-29.2 cm, leaves-light green in colour, leaf surface with soft hairs especially

on the adaxial side; auricles up to 5.7 mm long often completely surrounding the culms.

Spikes generally 12.5-14.2 cm long; awn 2.5-4.7 cm long; anthers yellow to violet in colour; spikes green to greenish-violet; the number of grains 3-7 per spikes.

*H. bulbosum* is diploid and tetraploid (2n=14 and 28). Due to its diploid and tetraploid nature, the seed setting per spike is very low (3-5 grains per spike). Generally vegetative reproduction through bulbs is considered more successful for large-scale cultivation for fodder purposes. In wild state, *H. bulbosum* is generally found as perennial in Mediterranean region and eastwards to Afghanistan and Southern USSR. The diploid type is found in Greece and Egypt and the tetraploid type is found in Southern Spain. It grows well in wet meadows. Under irrigated condition, the plant growth is luxurious and vigorous and three harvests can be made yearly.

An experiment was conducted for acclimatization and herbage yield for fodder purposes. It yielded 200 q/acre/year green fresh herbage. Domestic animals used to graze it very gracefully. It is a perennial source of green fodder, especially during winter when no grasses are available in the Uttarakhand.

It is highly resistant to yellow rust (*Puccinia striiformis*), powdery mildew (*Erysiphe graminis*) and loose smut (*Ustilago nuda*).

*Hordeum bulbosum* has been well acclimatized in the sub-temperate climate of Uttarakhand. Its bulbs are available to the farmers for fodder purposes. Breeders can use it in their breeding programme as a disease resistant donor.

**Reference**

Roland VB, J Niels, B Claus, BJ Rikke and LB Linde-Laursen (1991) An ecogeographical study of the genus *Hordeum* systematic and ecogeographic on crop gene pools. 7: IPGRI, Rome, Italy.