Screening breeding and major production techniques on dual-purpose oats in Qinghai province

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- general information of Qinghai province
- importance of oats in local agriculture
- germplasm of oats
- breeding of dual purpose oats
- major production techniques of oats
- goal of oats forage production
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General information of Qinghai

Location: East of Qinghai-Tibet Plateau, total area 720,000 square kilometers, 96% of them being pasturing area. Animal husbandry industry is the major economic income for the province.

Climate: High altitude, with average of 4000m. Dry, cold and strong wind in spring and frequent snow disaster.
Population: 5.5 million population, with 2/3 of the total living in east of the province.

West: desert

South and north: alpine meadow and dry rangelands, wet, low temperature

East: most agriculture, warmer
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importance of oats in local agriculture

Reliefs the seasonal conflicts between animal production and grass growth

Major measure in the project of supporting the poors in alpine region

Promotes the transaction from the traditional nominate animal husbandry to barn feeding and integrated animal production.

The establishment of oats feed-base lightens the grazing pressure on natural rangelands, which is an assistance in vegetation recovery on alpine rangelands
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germplasm of oats

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900 oats material

- Productivity evaluation
- Agronomic traits evaluation
- Germplasm conservation and reproduction
- Description of whole oat plants of some potential material
- Germplasm database setup

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Selected breeding

- Single plant selecting
- Comparison test
- District test
- Production test

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 Typical registered new varieties
Typical registered new varieties

Qingyin 1 oat (*Avena sativa* L. cv. Qingying1), is selected from qingyongjiu.
- height 125~157cm,
- seed yield 3450~4830kg/hm²,
- hay yield 15105~21570kg/hm².

Qingyin 2 oat (*Avena sativa* L. cv. Qingyin 2)
- height 144~161cm
- seed yield 3795~5400kg/hm²
- hay yield 17805~24795kg/hm².
Typical registered new varieties

Qinghai 444 oat (*Avena sativa* L. cv. Qinghai 444)
- Height: 130~135 cm
- Fresh grass yield at Xining: 33000~51000 kg/hm²
- Seed yield: 3000~3990 kg/hm²
- Resistance to lodging

Qinghai sweet oat (*Avena sativa* L. cv. Qinghai)
- Height: 140~160 cm
- Fresh grass yield: 38000~52000 kg/hm²
- Seed yield: 4500 kg/hm²

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Typical registered new varieties

Qingyan 1 oat (*Avena sativa* L. cv. Qingyan No.1)

- Height: 125cm~157cm
- Seed yield: 3390kg/hm²
- Grass yield: 42600kg/hm²
- Hay yield: 5652kg/hm²

Lena oat (*Avena sativa* L. cv. Lena)

- Height: 110cm~155cm
- Seed yield: 4140kg/hm²
- Grass yield: 37700kg/hm²
- Hay yield: 4485kg/hm²

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Typical registered new varieties

Qingyin 3 oat (Avena nuda L. cv. Qingyin No.3)
- height 120～150cm
- hay yield 8600～12800kg/hm²
- seed yield 2050～3200kg/hm²

Qingyou 3 oat (Avena nuda L. cv. Qingyou No.3)
- height 90～125cm
- seed yield 2805kg/hm²
- grass yield 44040kg/hm²
- hay yield 4725kg/hm²

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Major oat production techniques

Eight local standards on oat production are set up based on scientific research and practice, which include sowing amount, fertilizer application, seed harvest and selection and forage processing et al.

- oat cultivation technique regulation
- naked oat cultivation regulation
- sowing technique mixing oat with annual legume
- grass silage package regulation
- oat forage processing technique
- oat seed package, storage and transportation regulation
- forage multiple cropping technique in eastern Qinghai
- oat fertilization regulation
Oat seed production

- A platform integrating lab, field station and production base carries out scientific research, production and education.
- Seed reproduction and extension system: breeder seeds—seeds reproduction—seeds production
- Seed production base establishment with one variety by one village
- Oat production is overall arranged for variety distribution and planting
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deep processing of oat seeds

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Forage production

Mixed sowing grass with annual legume

**Optimum combination of grass and legume:**
- Oat + vetch or ryegrass + pea

**Optimum sowing amount**
- Oat 135kg + vetch 45 kg/hm²
- Ryegrass 18.75kg + pea 90kg/hm²

**Optimum harvest date**
- Around Qinghai Lake: seed-milking time
- Southern: after frost

**Optimum sowing time**
- Around: mid or late June
- Southern: mid June
Forage processing

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Overall distribution

- Oats planting mixed with legume around Qinghai Lake
- Seed production and multiple cropping forage in east
- Pen-growing and hay production in south
Seed production and multiple cropping in east
Pen-growing in south
Mixed planting around Qinghai Lake for forage production
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95% of oats production both for forage and seed are using improved varieties.

Presently oat growing area is 150,000hm². By 2015 the area would be 650,000hm², through the application and extension of fine varieties with hay yield would be four million.
Thank you!