TECHNICAL NOTES

Reseda lutea: A Multipurpose Plant for Arid and Semiarid Lands

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Highlight: *Reseda lutea* is a plant well adapted to the arid and semiarid rangelands of Iran. It provides early spring green growth, is palatable to sheep and goats, and compares favorably with alfalfa in nutritive content.

Aridity of the climate is the most important factor in limiting plant growth and, therefore, forage production in arid and semiarid lands. Limited existing or potentially available water does not leave opportunity for forage production under irrigation, because other demands of the increasing population are expanding constantly. Also, the cost of hay produced under irrigation does not leave the alternative to increase irrigated forages for livestock needs; furthermore, sheep and goat raising can be reliable if the animals can take most of their nutritional needs from rangelands. The only solution to solving the problem of forage and meat production in arid and semiarid rangelands in areas such as Iran seems to be *producing forage under dry farming*.

For seeding programs each area has the opportunity to use introduced plants; however, there are also many native species which still exist in the natural vegetation that could be used for reseeding. According to my experience, *Reseda lutea* can be considered as one of the most useful and multipurpose plants for arid and semiarid rangelands.

Growth Characteristics

Reseda lutea is a plant of the *Resedaceae* family, which is a perennial with deep roots and many erect and very fast-growing stems, each terminating in a series of flowers, and which remains green during the summer. The flowers are very attractive to honey bees, more attractive than clover (*Trifolium pratense*) flowers. It is a very early-growing plant, and, according to our observations, is one of the earliest growing in arid and semiarid rangelands.

Phenological observations in 1975 on southern slopes of Albourn Ranges, Iran, at 1,300 m elevation, gave the following growth periods:

Growth started	March 15
Flower buds forming	April 4
Flowering began	April 18
Flowering ended	June 2
Seed ripening	June 14
Growth ended	October 25

Comparing the beginning of growth of *Reseda* to other native species in the region, we observed an approximate 25-day interval in which *Reseda* produced forage ahead of the principal associated vegetation. *Reseda lutea* was 32.5 cm in height and in full flower on April 25; but the dominant species of the site, *Stipa barbata*, *Artemisia herba-alba*, and *Salsola rigida*, were in early growth. This early growth is very important, especially in mountainous regions or regions

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Fig. 1. Regeneration of *Reseda lutea* in difficult conditions, (near Karadj, Iran).

where there is a deficit of winter forage and the livestock suffer from shortages of forage during late winter and early spring.

Reseda produces considerable seeds, and the seeds germinate easily, even in very harsh conditions. The seedlings can become established under severe growing conditions. This can be observed from its distribution in Iran. It occurs in Iran from 100 mm annual precipitation in the northeast hills of Zahedan at 1,700 m elevation (Moghaddam 1975) to 400 mm 25 km south of Amol near the Caspian Sea at 300 m elevation (Moghaddam 1973).

The elevational distribution of *Reseda* ranges from 300 m south of Amol to 1,900 m in central Albourn. It survives well under extremes of temperatures, growing in northeast Zahedan, where temperatures can exceed 50°C, as well as in the Karadj Region and Albourn Mountains, where winter temperatures may fall below -25°C (Fig. 3).

Table 1. Chemical analysis of *Reseda lutea* and *Medicago sativa* grown at Karadj, Iran.

Species	Growth stage	Constituent (%) ¹				
		DM	CP	CF	Ca	P
<i>Reseda lutea</i>	Pre-flowering	18.8	17.5	23.6	2.5	0.27
	Full flowering	22.2	18.8	23.4	2.7	0.27
	Seed stage	31.1	16.1	43.4	1.9	0.22
<i>Medicago sativa</i>	Pre-flowering	20.6	24.6	13.8	2.3	0.30
	Flowering	27.9	16.8	28.6	2.4	0.15

¹DM = dry matter; CP = crude protein; CF = crude fibers; Ca = calcium; and P = phosphorus.

Fig. 2. Optimum growth of *Reseda lutea* at Karadj region, Iran.

Forage Value

According to data obtained from chemical analysis (Table 1), *Reseda* as compared with alfalfa (*Medicago sativa*) is high in nutritional value. The palatability of *Reseda* has been tested in feeding trials by range-grazed native sheep and goats, where it was compared with alfalfa (*Medicago sativa*) and crested wheatgrass (*Agropyron desertorum*). The green forage of the *Reseda*, alfalfa, and crested wheatgrass was cut into 5-cm pieces and fed on the range. Samples were weighed before and after each trial and the percents consumed of

Table 2. Consumption of *Reseda lutea*, *Medicago sativa*, and *Agropyron desertorum* in feeding trials with sheep and goats on the range.

Species	Weight (kg)		Percent consumed
	Before	After	
<i>Reseda lutea</i>	3.50	2.10	40
<i>Medicago sativa</i>	5.00	3.60	28
<i>Agropyron desertorum</i>	8.08	6.60	18

each species were calculated (Table 2). More *Reseda* was taken than either the alfalfa or crested wheatgrass.

Conclusion

The characteristics of growth, establishment, adaptation, and palatability of *Reseda lutea* indicate it not only can be a very useful plant for grazing or hay production for winter times in harsh conditions of arid and semiarid rangelands, but it also has a potential as a plant for establishing or improving cover in watersheds and areas with severe erosion. It also should be a useful plant for revegetating road cuts, mining areas, and spoil banks. Its distribution in different conditions leaves the opportunity to use this plant not only in restoring natural vegetation in Iran, but in similar conditions in other countries.

It is recommended that studies be undertaken about introduction of this plant into variable ecological conditions.

Literature Cited

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