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REGAR BROMEGRASS

FOSTER McKAY OWENS



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AUTHORS

Ronald B. Foster is manager of the Plant Materials Center, Soil Conservation Service, Aberdeen.

Hugh C. McKay is Superintendent and Agronomist at the Tetonia Branch Experiment Station.

Edward W. Owens is Superintendent and Horticulturist at the Aberdeen Branch Experiment Station.

SUMMARY

1. REGAR bromegrass, *Bromus biebersteinii*, is generally adapted to the same soils and geographic areas of Idaho as smooth bromegrass, *B. inermis*, under both irrigated and dryland conditions.
2. Selected for its strong regrowth characteristic, REGAR bromegrass gives good seasonal distribution of total season forage production.
3. Spring growth begins earlier than on some other widely used grass varieties.
4. Forage production in plots and on a field-scale basis has been equal to or exceeded that for Manchar smooth bromegrass.
5. REGAR bromegrass and alfalfa plants have been compatible when planted together. Solid stands of REGAR plants have given strong competition to annual and perennial weeds.
6. REGAR is a heavy producer of roots and crowns.
7. Forage quality is similar to that of smooth bromegrass. Vegetative growth has been well accepted by all classes of livestock as both green feed and cured hay.
8. Seed production is good but the variety is susceptible to covered smut infection, the causal organism being *Ustilago bullata*. Seed treatment is recommended.
9. REGAR bromegrass has good seedling vigor and stands are easy to establish on well prepared seedbeds.
10. Field testing has indicated that the variety performs well on farms with different kinds of livestock enterprises and systems of management.
11. REGAR bromegrass is winter hardy and long lived.
12. This grass should be considered a part of the forage family of improved grass varieties and used as a supplement to rather than a total replacement for the other grass varieties. It can extend the length of the prime grazing season as well as increase total forage production.

REGAR BROMEGRASS

By Ronald B. Foster, Hugh C. McKay and
Edward W. Owens

ORIGIN AND SELECTION

The international name for this grass species is *Bromus biebersteinii* Roem and Schult. The accession PI-172390 from which the REGAR variety was selected was collected near Zek, in Kars Province, Turkey, in 1949, and introduced into the United States through the USDA Regional Plant Introduction Station, Agricultural Research Service. The USDA Soil Conservation Service, Aberdeen Plant Materials Center, received a small packet of seed from the Ames, Iowa, Plant Introduction Station in 1957. This seed was planted in an irrigated nursery at Aberdeen in the spring of 1958. Fifteen clones were selected from this nursery, the seed was bulked, and constitutes the breeder seed for the variety REGAR. The name REGAR is derived from the word *regrowth* which is one of the outstanding characteristics of the variety. The AR ending designates the release of a grass variety by the USDA Soil Conservation Service Plant Materials Centers and Agricultural Experiment Stations of the Pacific Northwest.

GENERAL DESCRIPTION

REGAR brome grass contains some of the good features of both smooth brome and orchardgrass. The seeds germinate readily, seedling vigor is good, and seedlings establish rapidly. Leaves are numerous, dominantly basal, mildly pubescent, and light green. Seed stalks are erect and extend above the leaf mass in an open panicle. The plants head 7 to 10 days earlier than smooth brome and mature that much earlier. With favorable soil moisture the leaves stay green and continue to grow after the seed crop is mature. The plants green up early in the spring and remain green late into the fall.

Table 1. Root and crown yields from three grasses on two different soil series. Samples were collected October, 1965.

	Roots	Crowns	Legume	Total	Yield
Tetonia (dryland)*					
Seeded 1961					
REGAR brome	6,802‡	5,653	0	12,455	6.22
MANCHAR smooth brome	4,157	1,563	0	5,720	2.86
Rigby (irrigated)†					
Seeded 1963					
REGAR - Cascade trefoil	4,371	3,322	391	8,084	4.04
LATAR - Cascade trefoil	3,998	3,767	124	7,880	3.94

* 5 growing seasons, Tetonia soil series.

† 3 growing seasons, Heise soil series.

‡ Average includes 3 samples for each variety.

This grass species is classed as a bunchgrass but there is some vegetative spreading under dryland conditions and a moderate amount under irrigation in the REGAR variety. This characteristic provides soil protection not found in the grass varieties that are true bunchgrasses. REGAR does not become sod bound as rapidly as do the vigorous sodding grasses. It is compatible with other seeded perennial grasses and legumes.

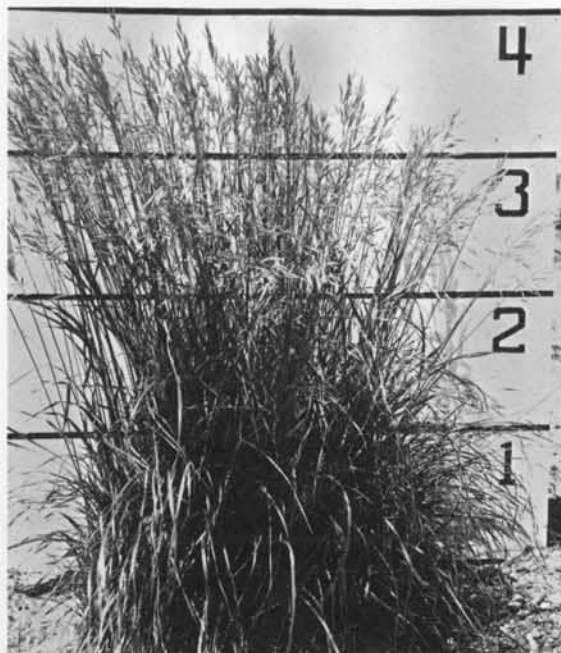
REGAR produces large quantities of roots and crowns which maintain or increase soil organic matter. Root and crown production has been measured and the results are reported in table 1.

REGAR brome seeds are similar in appearance to those of smooth brome except for a very short awn. Seed produced under irrigation at Aberdeen averages about 80,000 seeds per pound and weighs 18 pounds per bushel.

REGAR brome has good drought tolerance and excellent winter hardiness.

Length of life has not been determined but plants established in 1957 are still strong and vigorous so the variety can be classified as a long-lived perennial.

Figure 1. Profile picture of a typical REGAR brome grass plant.



ADAPTATION AND USES

Results from plot work and field plantings in southern Idaho and northern Utah indicate that REGAR brome grass is adapted to the same soils and climatic conditions as smooth brome grass. These can be irrigated or non-irrigated if average annual precipitation is above 14 inches and the elevation is above 4,000 feet. There are some indications that its range may extend into a lower rainfall zone and to slightly lower elevations than smooth brome grass.

REGAR can be seeded alone or in a mixture with alfalfa or some other legume.

REGAR bromegrass is well adapted for pasture use. It starts growth in the spring earlier than some other improved grass varieties and consequently reaches grazing readiness at an earlier date. The good regrowth after grazing contributes to its value as a pasture plant. The green forage is very acceptable to livestock, and in several instances the partially mature standing forage has been utilized by livestock more completely than similar forage of smooth bromegrass. The grass has been harvested for hay and fed to cattle, sheep, and horses. All three classes of livestock have accepted and utilized the hay.

The early heading characteristic of REGAR is a moderate detriment to its compatibility with alfalfa for hay. However, most heads appear in the first cutting and only a few seed heads are formed after the first two years. The dense basal leaf growth makes excellent quality feed in the first and subsequent cuttings.

LATAR orchardgrass is a better choice of a grass with alfalfa for hay in irrigated areas where two or more cuttings are obtained.

Chemical analysis indicates the forage to have food values similar to smooth bromegrass.



Figure 2. Regrowth on REGAR bromegrass and LATAR orchardgrass after heavy spring use.

CULTURE AND MANAGEMENT

Standard culture and management practices that produce good results with other improved grass varieties are adequate for maximum performance of REGAR bromegrass. These practices include drilling in a moist, firm seedbed with minimum competition from companion crops and irrigating at frequent intervals (7 to 10 days).

Normal fertilizer practices that produce good results with other perennial grasses will also produce good results with REGAR. When REGAR is seeded alone, 80 to 100 pounds of available nitrogen per growing season

applied in two applications under irrigation will produce high forage yields and stimulate the regrowth characteristic of the grass. For the areas with longer growing seasons, even higher rates may be advisable to utilize the full growing season. Nitrogen fertilizing under dryland conditions is not commonly practiced but may be beneficial and produce economical returns when seasonal precipitation exceeds 16 inches. This may be especially true when yields decline with age of stand.

Animals should be withheld in the spring until the grass is 8 to 10 inches high. Grazing animals should be removed when there is still 3 to 4 inches of stubble on the plants. A 3- to 4-week regrowth period is necessary for maximum forage production and longevity of stand. Six to eight inches of regrowth should be allowed in the fall to build root reserves that will provide early growth the following spring.

FORAGE PRODUCTION

Yields under Irrigation

The first irrigated plot was seeded in 1958. Forage yields were taken in 1959 and have been taken in one or more nurseries every year since. Yields have consistently been as good or better than the standard variety of smooth brome grass that is in common use in irrigated pastures. Production of forage by REGAR has had better seasonal distribution than smooth brome grass. As stands age beyond 4 years, the forage production advantage that REGAR exhibits over Manchar smooth brome grass becomes increasingly more pronounced. This can be attributed to the "sodbound" condition that develops with smooth brome grass.

Yields of air-dry forage by cuttings and years from irrigated plots at Aberdeen are given in table 2.

Table 2. REGAR brome grass and Manchar smooth brome grass forage yields under irrigation at Aberdeen.

		Air-dry forage tons per acre			
		First cutting	Second cutting	Third cutting	Total for season ¹
1958 nursery (No statistical analysis)					
1959 yields	REGAR	2.24	1.57	1.09	4.90
	Manchar	1.24	0.83	0.38	2.45
1961 nursery					
1962 yields	REGAR	1.31	1.24	0.36	2.91
	Manchar	2.35	0.92	0.12	3.39*
1963 yields	REGAR	3.49	0.83	0.49	4.81
	Manchar	3.67	0.83	0.21	4.71 N.S.
1962 nursery					
1962 yields	REGAR	1.26	Establishment year		1.26
	Manchar	0.75	Establishment year		0.75*
1963 yields	REGAR	3.71	1.20	0.73	5.64
	Manchar	4.09	1.15	0.26	5.50 N.S.
1964 nursery					
1964 yields	REGAR	0.38	Establishment year		0.38*
	Manchar	0.72	Establishment year		0.72
1965 yields	REGAR	3.08	0.55	0.00	3.63
	Manchar	3.52	0.36	0.00	3.88 N.S.

* Significantly different at the .05 level of probability.

N.S. Yields not significantly different.

¹ Average of 2 to 4 replications.

Yields on Dryland and Range

Performance of the variety in plots on the Tetonia silt loam soil at the Tetonia dryland experiment station has been good. The precipitation at this location averages approximately 13.25 inches per year. It fluctuates from 9 to 21 inches with periodic wet and dry cycles. Consistently good stands have been obtained in plots in both wet and dry years. Performance of REGAR has been generally good with no apparent adverse effects from the rigorous climate. Forage production in different nurseries from several years is summarized in table 3.

Table 3. REGAR bromegrass and Manchar smooth bromegrass air-dry forage yields at the Tetonia Dryland Experiment Station.

		one cutting ¹	Regrowth
		tons/acre	inches
1961 nursery			
1962 yield	REGAR	0.83	12
	Manchar	0.82 N.S.	4
1963 yield	REGAR	2.42	14
	Manchar	1.78*	5
1964 yield	REGAR	1.22	4
	Manchar	1.07 N.S.	2
1965 yield	REGAR	0.80	6
	Manchar	0.57 N.S.	2
1963 nursery			
1964 yield	REGAR	3.99	6
	Manchar	4.18 N.S.	2
1965 yield	REGAR	0.61	—
	Manchar	0.83 N.S.	—

N.S. Not significantly different.

* Significantly different at the .05 level of probability.

¹ Averages of 3 to 5 replications.

INSECTS AND DISEASE

There has been no insect or disease problem in forage producing fields. Banks grass mite has been observed in seed production fields but only at moderate levels of infestation.

This variety of grass is susceptible to covered head smut. The specific organism is *Ustilago bullata* Berkeley (Fisher 1953). This organism can be either seed- or soil-borne. All seed should be treated with a suitable fungicide that contains mercury. Such treatment will kill the spores that adhere to the seed. Seed treatment will aid in preventing infection if the seed is planted in noninfected soil, but will not control it completely if invasion by the smut fungus occurs from naturally infected soil. Seed production should be centered in areas where the soils are relatively free of infestation by the *U. bullata* soil-borne organism.

The organism and resulting smut is of little consequence when the grass is seeded for forage production, either as pasture or hay.

SEED PRODUCTION

REGAR bromegrass is a good seed producer. At Aberdeen under irrigation on large-scale increase fields, seed production has ranged from 200 to 450 pounds of clean seed per acre. High yields occur in the first harvest

year with a marked decline thereafter. Under dryland conditions the yield the first year is approximately 300 pounds with a drop to about 100 pounds in the third harvest year. Because of this rapid drop in seed yield, three harvests are the maximum that can be expected under either dryland or irrigated conditions.

Standard grass seed production practices should be followed with this variety. It should be seeded in 24- to 36-inch rows and cultivated for weed control. Under irrigation 50 pounds of actual nitrogen should be applied prior to seeding and then 80 to 100 pounds applied in the late fall or early spring for each seed-harvest year.

Two or three irrigations should mature a seed crop. One irrigation after harvest stimulates regrowth which rebuilds root reserves for the next year's seed crop.

Volunteer seedlings from shattered seed have to be eradicated if the field is to meet Idaho Crop Improvement Association's specifications for seed certification.

Certified seed cannot be used to establish a seed field for certification. Certified seed is recommended for establishing seedings for forage production. Seed fields are to be established from foundation or registered class seed. This assures varietal purity and prevents any genetic shift that can occur in plants of a complex genetic nature such as is found in this variety.

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