

Forage Varietal Adaptation Experiment

The desire of livestock growers in Central Oregon to have more information on the adaptability of grasses and other forage plants, both irrigated and dryland, to local conditions, and the desire of the Oregon Agricultural Experiment Station to know the range of adaptability of these grasses, has brought about the establishment of a series of dryland and irrigated forage trials by the Central Oregon Experimental Area.

These trials have been laid out in accordance to the design established for the state uniform forage nursery plantings; that is, 6' x 20' plots with three replications. Dryland nurseries planted in rows one foot apart and irrigated trials broadcast seeded.

The objectives in establishing these trials were to determine whether a variety would grow under Central Oregon environmental conditions, the longevity of stand, and by observation its general performance and production.

Two trials have been established under typical irrigation conditions, a third trial where it will be watered when water is available. Three trials have been established on dry land, one of which was seeded in the fall of 1952.

The trial seeded in the fall of 1952 failed. A nursery was seeded in the Prineville area during the fall of 1953.

Stand notes taken are on the following basis:

- 0 - No stand.
- T - Trace.
- 1 - Thin stand.
- 2 - Average (adequate) stand.
- 3 - Better than average stand.

The 1953 dryland forage trials ratings are a combination of stand and production. These ratings are shown on the tables as "Varietal Vigor Ratings" and are an attempt to draw together notes on stand and production in order that one symbol can be used to evaluate a variety's worth. Since no forage yield data has been taken, the emphasis is principally on stand. These ratings are:

- 0 - Poor - probably not adaptable
- 1 - Fair
- 2 - Good
- 3 - Excellent

Irrigated Forage Nurseries

Willows Ranch Forage Nursery

The Willows Ranch nursery is located approximately one mile north of Sisters in an old meadow which was being developed into an improved pasture. The soil is largely pumice but with a higher organic matter than most Central Oregon soils. The area in which the trial was planted sloped toward a creek with the first replication being farthest from the creek.

When the area was seeded May 10, 1950, it was obvious that there was a considerable range in organic matter and moisture in the soil with the first replication being somewhat similar to the dryland areas and the third replication being considerably more moist and higher in organic matter.

The rancher planned to divert part of the creek flow and to irrigate during the late spring and summer if and when water was available. Not knowing quite what to expect in the way of available irrigation water, grasses were included which varied from strictly dryland species to wet land species such as Reed canary grass and Meadow foxtail. A mixture of Alsike and Ladino clover was broadcast seeded in all but legume plots.

During the summer after seeding, a good stand of all the grasses and legumes were obtained; however, from late summer 1950 until late spring of 1952, the irrigation was not controlled. As a result, the third replication was under water almost all of the time and replications 1 and 2 received too much water for all of the dryland species and some of the irrigated species.

Consequently, species such as western wheatgrass, intermediate wheatgrass, burning brush, creeping alfalfa, and Canada wild rye went out entirely while species such as smooth brome grass, orchard grass, Tualatin tall oatgrass either failed to survive or only very light stands remained (See Table No. 60).

Rainier red fescue, chewings fescue, and alta fescue flourished in replications 1 and 2 and only Reed canary grass, the meadow foxtails, Cornell timothy and tall fescue survived in all three replications. Considering the treatment, the clovers grew very well with alsike in the predominance. Perhaps the reason for survival of Cornell timothy and tall fescue in the third replication was because they were on the high end of the plot and were not submerged as long as the other varieties. The Reed canary grass developed into an excellent stand and is spreading into the adjoining plots. It is apparently as acceptable to livestock as the other varieties.

1953

The nursery was grazed regularly during 1953. No perceptible change in stand or production was noted.

Campbell (Livingston) Irrigated Forage Nursery

The nursery was seeded in 1949 but because of a very cold and windy spring the stand failed to establish. The nursery was reseeded April, 1950, and contains the varieties listed Table No. 61. The area into which the trial was seeded is fairly typical of the alfalfa area; that is, the soil is quite sandy, with soils in the loamy sand and coarse loamy sand textures. The area is more frosty than average for central Oregon and rather low in production. It will respond well to nitrogen applications but heavy nitrogen applications have not been made on the trial planting.

A reasonably good stand was obtained with all grasses and legumes; white clover was broadcast in all grass plots. The trial has been observed several times since planting but it is difficult to draw any conclusions because the area is generally heavily grazed and cattle continually graze the one pasture area. Consequently, about all that can be said is that no variety has gone out and that there is apparently little difference in stand at this time.

Table No. 60
Irrigated Forage Nursery
Willows Ranch, Sisters, Oregon

Common Name	Botanical Name	Pedigree	Stand by (1)		
			Replication		
			1	2	3
Smooth bromegrass	<i>Bromus inermis</i>	Fischer	0	T	0
Smooth bromegrass	" "	Nebr. 36	1	0	0
Smooth bromegrass	" "	Nebr. 44	1	0	0
Smooth bromegrass	" "	Lincoln	0	0	0
Smooth bromegrass	" "	Sandberg	1	0	0
Smooth bromegrass	" "	Achenback	1	1	0
Smooth bromegrass	" "	Manchar	1	1	0
Smooth bromegrass	" "	Utah-12	0	T	0
Smooth bromegrass	" "	Kuhl-Oreg.	0	0	0
Orchard grass	<i>Dactylis glomerata</i>	233	0	0	0
Orchard grass	" "	S-143	0	0	0
Reed canary grass	<i>Phalaris arundinacea</i>		3	3	3
Tualatin tall oatgrass	<i>Arrhenatherum elatius</i>		0	0	0
Meadow foxtail	<i>Alopecurus pratensis</i>	Comm.	2	T	3
Meadow foxtail	" "	Creeping	3	3	3
Burnet	<i>Sanguisorba minor</i>			0	0
Creeping alfalfa			0	0	0
Timothy	<i>Phleum pratense</i>	Cornell	3	3	3
Western wheatgrass	<i>Agropyron smithii</i>	Utah 52-2	0	0	0
Canada wild rye	<i>Elymus canadensis</i>		0	0	0
Tall fescue	<i>Festuca elatior</i> var. <i>arundinacea</i>		2	2	2
Ranier red fescue	<i>Festuca rubra</i>		3	3	0
Chewings fescue	<i>Festuca rubra</i> var. <i>cummutata</i>		3	1	0
Alta fescue	<i>Festuca elatior</i> var. <i>arundinacea</i>		1	3	0
Ree wheatgrass	<i>Agropyron intermedium</i>		0	0	0
Intermediate wheatgrass	<i>Agropyron intermedium</i>	Nebr. 50	0	0	0
Burning brush	<i>Kochia scoporia</i>		*		

* 1 replication was planted. It did not reseed.

(1) There was no perceptible change in stand during 1953.

Table No. 61
Irrigated Forage Nursery
Campbell Ranch (Livingston) - Alfalfa, Oregon

Common Name	Botanical Name	Variety or Pedigree	1953 (1) Stand
Tall fescue	<i>Festuca elatior</i> var. <i>arundinaceae</i>		1
Chewings fescue	<i>Festuca rubra</i> var. <i>commutata</i>		3
Tall fescue	<i>Festuca elatior</i> var. <i>arundinaceae</i>	Alta	2
Tall fescue	" " " "	Goar	2
Tall fescue	" " " "	K-31	3
Red fescue	<i>Festuca rubra</i>	Rainier	3
Smooth bromegrass	<i>Bromus inermis</i>	Achenback	T
Smooth bromegrass	" "	Manchar	T
Smooth bromegrass	" "	Kuhl	T
Timothy	<i>Phleum pratense</i>	Common	T
Timothy	" "	Lorain	T
Timothy	" "	Cornell	T
Meadow foxtail	<i>Alopecurus Pratensis</i>	P-3	3
Meadow foxtail	" "	Ore. 12	3
Tall oatgrass	<i>Arrhenatherum elatius</i>	Tuelatin	3 (2)
Creeping alfalfa		Nomad	T
Creeping alfalfa		Rhizoma	T
Orchard grass	<i>Dactylis glomerata</i>	Sel. 233	1
Highland Bent	<i>Agrostis tenuis</i>	Common	3
Perennial ryegrass	<i>Lolium perenne</i>	Oreg.	T
Orchard grass	<i>Dactylis glomerata</i>	P. I. 109072	T

T - Trace
1 - Fair stand
2 - Good stand
3 - Excellent stand

(2) Heavy mixture of species other than oatgrass.

1953

Table No. 2 indicates the stand in the nursery during late fall of 1953. As noted in the previous statements, this area has been heavily grazed continually at a low nitrogen fertility level. The effect of this management practice has drastically influenced stand.

For all practical purposes tall fescue, the smooth bromegrasses, the timothy grasses, creeping alfalfas, the orchard grasses, and perennial ryegrass have gone out. Of the remaining tall fescues, K-31 appeared to have the best stand. Highland bent, the narrow leafed fescues, chewings fescue, and rainier have excellent stands. The meadow foxtails have excellent stands and appear to be spreading.

The Tualatin tall oatgrass plot had a good stand. However, there was obviously several species of grass other than tall oatgrass in the plot area and at the time the readings were taken it was difficult to determine the species.

While the orchard grass plots were very poor, the trial area had some orchard grass plants in mixture which are surviving.

Where the grasses have gone out the area is being taken over by filaree and white clover.

Gladwill Forage Nursery

The Gladwill (formerly Cook Nursery) is quite similar to the Campbell nursery in varieties included and date of seeding (April 1950) with the exception that ladino clover was the legume broadcast over the grass plots. Varieties and observations are presented in Table No. 62. The trial is located on the Gladwill farm $2\frac{1}{2}$ miles east of Culver on a rather shallow and rocky Lamonta loam soil. A reasonably good stand of all grasses and legumes was obtained.

The trial was under continual grazing and consequently didn't allow observations on recovery from grazing or general production performance. Therefore, the first two replications were fenced with an electric fence in the late spring of 1952, shortly after the pasture had received a uniform application of 150# of ammonium sulphate per acre. The third replication was left unfenced to observe how long the various species could endure continual grazing.

When the notes for stand and production as influenced by recovery from grazing were taken, it was easily seen that the weiner pigs in the pasture were quite willing to chance the electric fence to get at the meadow foxtails and the creeping alfalfas in the trial. Consequently, their production is just an estimate judging from a spot or two missed.

From the notes taken, it would appear that the better species of grass as judged by observations on stand and recovery from pasturing and general production performance include the tall fescues, particularly alta and K-31, timothy varieties, particularly common and Cornell. The orchard grasses made good recovery and production, but only fair stands were observed.

The meadow foxtails, Tualatin tall oatgrass and perennial ryegrass had good stands and good production; however, not quite up to the tall fescues and timothy grasses in production.

Table No. 62
Irrigated Forage Nursery
Gladwill Farm - Culver, Oregon

Common Name	Botanical Name	Variety or Pedigree	Remarks (1) (4)
Tall fescue	<i>Festuca elatior</i> var. <i>arundinaceae</i>		Fair stand - good production
Chewings fescue	<i>Festuca rubra</i> var. <i>cummutata</i>		Good stand - fair production
Tall fescue	<i>Festuca elatior</i> var. <i>arundinaceae</i>	Alta	Excellent stand and production
Tall fescue	" " " "	Goar	Poor stand - good production
Tall fescue	" " " "	K-31	Excellent stand and production
Red fescue	<i>Festuca rubra</i>	Rainier	Good stand - low production
Smooth brome	<i>Bromus inermis</i>	Achenback	Very poor stand - other varieties overtaking
Smooth brome	" "	Manchar	Poor stand - poor production
Smooth brome	" "	Kuhl	Poor stand - production average
Timothy	<i>Phleum pratense</i>	Common	Stand and production excellent
Timothy	" "	Lorrain	Stand excellent, production good
Timothy	" "	Cornell	Stand and production excellent
Meadow foxtail	<i>Alopecurus pratensis</i>	P-3	Stand good - production (2)
Meadow foxtail	" "	Ore. 12	Stand fair - (2)
Tall oatgrass	<i>Arrhenatherum elatius</i>	Tualatin	Stand average - production good
Creeping alfalfa		Nomad	Stand excellent, production low (3)
Creeping alfalfa		Rhizoma	Stand excellent, production low (3)
Orchard grass	<i>Dactylis glomerata</i>	Sel.233	Fair stand (some mixture) good prod.
Highland bent	<i>Agrostis tenuis</i>		Stand good, low production
Perennial ryegrass	<i>Lolium perenne</i>	Oregon	Good stand, good production
Orchard grass	<i>Dactylis glomerata</i>	PI 109072	Average stand, good production

Seeded April 1950

- (1) From fall 1950 until late spring 1952, the pasture had been heavily grazed without heavy fertilizer application. In late spring 1952, shortly after 150# of ammonium sulphate had been applied, two replications were fenced off and on July 23 notes were taken.
- (2) Weiner pigs were able to get under the electric fence wire and they preferred the meadow foxtails and creeping alfalfas to all other species; consequently it was difficult to evaluate production.
- (3) The narrow leaf fescues made good recovery after grazing but their production was low in comparison to other species.
- (4) No perceptible change in stand during 1953.

Chewings fescue, Rainier red fescue, creeping alfalfas (Rhizoma and Nomad) and Highland bent had good stands and apparently recovered well from heavy grazing, but their production was quite low.

The smooth brome grass in the trial appear to be declining in stand and, considering the plant, had the poorest recovery from grazing and a low production.

1953

The lack of help and the late season made it impossible to continue with the forage production observations started in 1952.

The pasture received three applications of 150 pounds of ammonium sulphate during the growing season and in late fall appeared to be in excellent condition. There was no apparent change in stand.

Summary of Irrigated Forage Nurseries

There was no apparent change in stand and productivity in the Willows Ranch and Gladwill Nursery.

The Campbell (Livingston) Nursery showed a marked decline in stand of the smooth brome grasses, creeping alfalfas, orchard grasses, timothy grasses, and perennial ryegrass.

K-31 appeared to be the best of the tall fescues. Highland bent, chewings fescue, Rainier red fescue also had excellent stands.

The meadow foxtails P-3 and Oregon 12 maintained excellent stands and appeared to be spreading.