

Office Memorandum • UNITED STATES GOVERNMENT

TO : GUS HORMAY, Research Center Leader
Susanville Research Center, Susanville

DATE: November 2, 1959

FROM : DUNCAN E. WILLIAMS, Soil Scientist
Agricultural Research Service, Berkeley

SUBJECT:

From Gus:

Enclosed is a summary of the Secale selection and planting program carried out this past summer at Blacks Mountain.

A summary of the wheatgrass and smooth brome trials will be sent up as soon as this year's data has been processed.

Best Regards.



SECALE HYBRID PLANTINGS

LASSEN NATIONAL FOREST 1959

FORAGE AND RANGE RESEARCH BRANCH

AGRICULTURAL RESEARCH SERVICE AND U. S. FOREST SERVICE COOPERATING

Four plots each of three different Secale Hybrids were planted in the Grass Valley Nursery, Lassen National Forest, in the fall of 1956. Seed was supplied by Dr. G. Ledyard Stebbins, University of California, at Davis, who carried out the hybridization program.

The seed sown in these original plantings was selected from plants grown under entirely different climatic conditions from that of northeastern California. It was normal, therefore, to expect a certain amount of natural selection in these first plantings.

The three hybrids planted were:

1. Secale (cereale X montanum) X africanum.
2. Secale cereale X montanum - selected F₃ plants.
3. Secale cereal X montanum - a short-straw winter rye X anatolicum type.

The growth and vigor of these plots was moderately good the first year, however, the stand was only fair. As pointed out previously, this may have been due simply to natural selection. Growth and vigor was outstanding the second year which was an unusually wet year for the region. Total growth appeared to exceed that of any of the highest producing wheatgrass species and strains seeded in an adjacent experimental area. Although no harvestings were made of the Secale plantings.

Growth and vigor this past year, one of the three driest on record for the region was outstanding, again outproducing the adjacent wheatgrasses.

Due to the outstanding performance of these hybrids in both a wet and dry year, representing extremes for the area, selections were made in August of 1959 for seed increase and further field testing.

These selections were made on the basis of the following characteristics: third year vigor, leafiness, total vigor (second or third year), grain production (nonshattering) and time of maturity (late and early types).

The following is a list of the selections made:

<u>Selection Number</u>	<u>Percentage</u>	<u>Date Selected</u>	<u>Characteristics</u>
1	Se(ceXmo)X af. X ?	8/27/59	Selected for third year vigor. Plant leafy, medium short, and bushy. Seed heads medium to short--fair uniform ripening. Some shattering. Basal diameter--10 in.
2	Unknown--probably Se(ceXmo)X ?	8/27/59	Second year plant selected for tremendous second year vigor and grain yielding characteristics. Seed heads 11 - 17" long - non-shattering. Plant leggy, leafiness confined to basal area. Vigorous new green shoots, emerging late late in season.
3	Unknown--probably Se(ceXmo)X ?	8/27/59	Second year plant selected for height, and overall vigorous growth. Moderate leafiness. Mostly basal. Basal diameter 12" - height 42". 135 individual seed stalks on single selected plant.
4	Unknown	8/27/59	Second year plant selected for greenness, leafiness and good grain yielding qualities. Late uniform ripener - 85% green at time of selection. Bluish color.
5	Mixed composite	8/27/59	A mixture of similar types selected for leafiness, second and third year vigor, good grain yielding characteristics and strong perennial characteristics.
6	Mixed composite	8/27/59	A mixture of similar types of second and third year plants selected for total vigor with an emphasis on high grain yielding characteristics.

<u>Selection Number</u>	<u>Percentage</u>	<u>Date Selected</u>	<u>Characteristics</u>
7	Unknown	9/1/59	A second year plant selected for overall good vigor, leafiness and forage qualities. An emphasis was placed on late maturity. Plant 90% green at the time of selection.

Selection numbers 2, 3, 4, 5, and 6 were planted in isolation in units 3 and 5 of the Harvey Valley Experimental Range Allotment, Lassen National Forest, in September of 1959. (See attached map).

A list of the planting sites and the selections seeded at these sites is as follows:

<u>Planting #</u>	<u>Selection #</u>	<u>Plot Size</u>
1	6	8 rows - 30 ft. long.
2	2 & 5	A seeding of selections # 2 and 5 to permit cross pollination. 2 rows - 25 ft. long - Selection # 2. 2 rows - 25 ft. long - Selection # 5. 2 rows - 25 ft. long - Selection # 2. TOTAL PLOT SIZE - 6 rows - 25 ft. long.
3	3	6 rows - 30 ft. long
4	5	4 rows - 20 ft. long
5	4	3 rows - 20 ft. long
6	2	3 rows - 20 ft. long

Several divisions of Agropyron cristatum - Agropyron repens natural hybrids were planted at each of the secale planting sites except # 6. These are in no way connected with the Secale program and were included only as a convenience in plantings.

<u>Secale Planting Site #</u>	<u>Ag. cr. X Ag. re. Plantings.</u>
1	Div. 18 - 6 plants
2	Div. 17 - 11 plants
3	Div. 15 - 7 plants
4	Div. 14 - 1 plant
5	Div. 13 - 4 plants

After selection in the fall of 1959, the original secale hybrid plantings were grazed. The cattle took the plants well and with equal preference to the natives and other introduced species. Little or no grazing damage to the original plantings was noted although some 1st and 2nd year plants were uprooted. These original plantings were cleaned and graded as to regrowth vigor after the cattle had been removed. Several plants of the original Se(ceXmo) selected F₃ plants showed excellent recovery from grazing and excellent regrowth vigor. These plants were tagged and seed will be selected next year. Dr. Stebbins has reported some difficulty in the earlier plantings of these secale hybrids in their ability to withstand the effect of grazing. The plants apparently are able to withstand the grazing effect itself, but under heavy use where trampling has severely compacted the soil, the secale hybrids have been unable to persist. This trampling effect is probably more serious in medium to heavy textured soils than in lighter textured soils. An effort will be made in the selection program to select out those plants showing evidence of being able to vigorously persist under heavy grazing use.

HARVEY VALLEY EXPERIMENTAL RANGE ALLOTMENT - 1956
LASSEN NATIONAL FOREST

SECALE HYBRID PLANTINGS

- ② Unit number
- 5 Planting number

Selections made Aug. 1959 - Grass
Valley Nursery.
Plantings installed Sept. 1959

Ag. cr. x Ag. re.
(Div. 13 - 4 plants)

