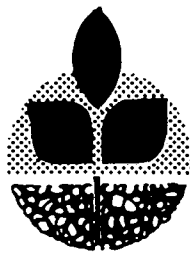


Alfalfa Trials in Southern Oregon -- Production Practices and Varieties

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ABSTRACT

Alfalfa is an important crop in Jackson, Josephine and Douglas counties of southern Oregon. Its farm value is about \$2½ million per year. Many varieties are available for planting in the area. More than 80 alfalfa varieties and experimental selections have been evaluated for hay production since 1959 at the Southern Oregon Experiment Station, Medford. This report discusses the management practices used in the tests and presents yield data and observations for the different alfalfas.

KEYWORDS: alfalfa varieties, alfalfa management

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ALFALFA TRIALS IN SOUTHERN OREGON- PRODUCTION PRACTICES AND VARIETIES

John A. Yungen

INTRODUCTION

Alfalfa hay is grown on nearly ten thousand acres of land in Jackson, Josephine, and Douglas counties of southern Oregon. The farm value of the hay is about two and one half million dollars per year. Most is consumed by livestock in the area, and some is sold for use in the coastal area. It is grown on irrigated land as well as on some of the deeper dryland soils. Yields range from three to more than nine tons of hay per acre, depending on growing conditions, soil types, irrigation, fertilizer applications, stand, variety, diseases, and other management considerations.

The productive life of alfalfa in southern Oregon can be shortened by root diseases, especially bacterial wilt, Corynebacterium insidiosum, fusarium wilt, Fusarium oxysporum, and by Phytophthora root rot, Phytophthora megasperma, on some of the heavier, less well-drained soils. Foliar diseases and stem nematodes occasionally are present in sufficient concentrations to cause stand damage. Fortunately, plant breeders are making rapid progress in developing varieties with improved disease resistance.

One of the most important management decisions in the production of alfalfa hay is the selection of a variety best adapted to the growing conditions that will be encountered in a particular field. Many varieties are available for planting, and growers need information as to which ones will perform best under their set of conditions.

Alfalfas for hay can usually be classed as being short, medium, and long rotation types with respect to stand life. Short rotation types are usually productive for one to two years; medium rotation types may be productive three to four years, and long rotation alfalfas should remain productive at least five years.

Talent alfalfa was released by this station in 1950 and was widely grown in southern Oregon, western Oregon, and western Washington. It was tolerant to the stem nematode Ditylenchus dipsaci (Kuhn), but had little tolerance to bacterial wilt. It is no longer widely grown, but is used as a standard of comparison in evaluating new alfalfas in the area.

A series of trials has been conducted at the Southern Oregon Experiment Station, Medford, to identify alfalfa varieties best adapted to the soils, climate, and farming systems of the area. More than 80 alfalfas have been evaluated since 1959 for yield, quality, and disease resistance as indicated by stand life. Most of the alfalfas were classed as being moderately winter-hardy although a few hardy types were included.

STAND ESTABLISHMENT

Seedbed preparation

The alfalfas were grown on a deep, well-drained soil classified as Central Point sandy loam. Soil tests were made before planting to serve as guides for applying fertilizer and lime. The soil test values were generally in the low to medium range for phosphorus and potassium, with adequate amounts of calcium and magnesium. During seedbed preparation, phosphorus was applied at 35 to 44 pounds per acre (80 to 100 P₂O₅), potassium was applied at 66 to 83 pounds per acre (80 to 100 K₂O), and sulfur was applied at 40 to 60 pounds per acre. The pH of the soil ranged from 6.3 to 6.5, and based on soil tests, lime was not applied.

A pre-plant incorporated herbicide treatment was used in each of the trials. EPTC (Eptam) was used in 1959 and 1965 plantings at 2.5 and 3.0 pounds per acre, respectively. In later plantings, a combination of EPTC at 2.5 pounds per acre and benefin (Balan) at 1.0 pound per acre was used to improve broadleaf weed control in the seedling alfalfa, particularly of knotweed, Polygonum aviculare, which can be very competitive in seedling alfalfa. The herbicides were mixed in the surface two to three inches of soil immediately after they were applied.

Seeding

Fresh commercial inoculants were applied to the seeds at the time of planting. The seeds were slightly moistened with water to increase adhesion of the inoculant.

In the 1965 planting, the seeds were broadcast on the soil surface, raked in lightly, and then a roller was used to firm the seedbed, improve seed contact with soil particles, and to help conserve soil moisture for seed germination. In the other trials, the seeds were drilled to a depth of approximately 0.5 inch with a Planet Jr planter and then the roller was used to firm the seedbed. The seeding rates were 10 or 12 pounds of pure live seed per acre for both the broadcast and drilled seedings. The spacing for the drilled rows was 12 inches. The seedings were all made in April of the different years.

STAND MANAGEMENT

Irrigation

Overhead sprinklers were used for irrigation in all the trials. In new seedings, irrigations were frequent, but light, with applications of about 1 inch of water each time. The Central Point sandy loam soil holds approximately 1.5 inches of available water per foot of depth. On established alfalfa, about 5 inches of water were applied after each harvest; 3 inches more were applied about 14 days later. Irrigation before the first harvest was used only in years when precipitation from spring rains was well below normal. From 18 to 25 inches of water were applied per season. Precipitation at the station averages 20.19 inches annually.

Harvesting

Alfalfa was cut three times in the seedling year, while established alfalfa was harvested four times per year, usually at the late bud to early bloom stage of maturity. Cutting dates were generally about June 1, July 6, August 15, and September 25. Fall regrowth after the fourth harvest was not harvested but was left to help build up carbohydrate reserves in the root systems.

Weed control

Herbicides were applied in October or November in established plantings. Either diuron (Karmex) at 2.4 pounds per acre or simazine (Princep) at 1.6 pounds per acre was used. As stands became older, dinoseb (Premerge, Sinox PE) was sometimes applied at 2.25 to 3.0 pounds per acre in late February as a dormant spray to control annual weeds escaping the fall treatment.

Maintenance fertilizers

Maintenance fertilizers were applied in the fall or winter each year at the following rates: phosphorus, 26 to 35 pounds per acre (60 to 80 P₂O₅), potassium, 50 to 66 pounds per acre (60 to 80 K₂O), and sulfur, 40 pounds per acre. If soil tests indicated boron was needed, three pounds per acre were applied.

ALFALFA TRIALS AND YIELD DATA

1959 seeding

Twelve commercially available alfalfas were seeded April 2. Talent and Lahontan were reference varieties. Yield data was taken for six production years from 1960 through 1965. Table 1 presents data from the trial as seasonal and six-year total yields.

Varieties with the greatest degrees of resistance to bacterial wilt disease had the highest yields and strongest stands after six production years. These included Orestan, Vernal, Zia, and Lahontan. Stands of Ranger, Cody, and varietal blend NK 919 were thinning and yields were declining. The stand of Teton remained fairly good but its yield was low.

DuPuits was very productive in its first three production years but the stand thinned and its yield declined rapidly after the third year. Talent was productive for four years before stand thinning resulted in lower yields. African was productive three years but lack of winter hardiness and stand thinning caused its yield to decline.

Rambler, an alfalfa with creeping root habit, was moderately productive for three years before stand thinning lowered yields. It is usually grown under dryland conditions and is often harvested by grazing.

Most of the alfalfas produced from 30 to 35 percent of their seasonal production in the first harvest. Rambler and Teton averaged 38 and 40 percent,

respectively, of their seasonal production in the first harvest, more typical of alfalfas developed for dryland conditions or for grazing than for irrigated hay production.

Under conditions of the trial, for intensive hay production under irrigation, Lahontan, Orestan, Vernal, and Zia could be considered as long-rotation types, Talent for rotations of four years, and DuPuits for three years.

Table 1. Yields of commercial alfalfa varieties from 1960-1965, seeded in 1959 at the Southern Oregon Experiment Station, Medford

| Variety | Air-dry hay, tons per acre | | | | | | Total | Average | Percent yield in 1st cut |
|----------|----------------------------|------|------|------|------|------|-------|---------|--------------------------|
| | 1960 | 1961 | 1962 | 1963 | 1964 | 1965 | | | |
| Orestan | 8.06 | 9.03 | 8.48 | 7.00 | 7.36 | 6.80 | 46.73 | 7.79 | 34.9 |
| Vernal | 7.39 | 8.37 | 7.66 | 7.33 | 7.69 | 7.36 | 45.80 | 7.63 | 33.1 |
| Zia | 7.14 | 8.83 | 8.44 | 7.04 | 7.07 | 6.89 | 45.41 | 7.51 | 33.9 |
| Lahontan | 8.61 | 8.80 | 8.21 | 5.65 | 5.93 | 6.36 | 43.56 | 7.26 | 35.6 |
| Ranger | 8.50 | 8.78 | 8.35 | 5.52 | 5.01 | 5.62 | 41.78 | 6.96 | 33.2 |
| Cody | 8.39 | 8.64 | 8.09 | 5.64 | 5.49 | 4.87 | 41.12 | 6.85 | 33.0 |
| Talent | 7.81 | 8.95 | 8.58 | 7.03 | 5.13 | 3.41 | 40.91 | 6.82 | 30.5 |
| NK 919 | 8.58 | 8.56 | 8.36 | 5.19 | 4.87 | 4.41 | 39.97 | 6.66 | 30.9 |
| Teton | 7.27 | 7.89 | 7.15 | 4.78 | 3.35 | 2.30 | 32.74 | 5.46 | 40.0 |
| DuPuits | 9.03 | 9.03 | 9.18 | 4.48 | - | - | 31.72 | 5.29 | 34.9 |
| Rambler | 6.98 | 7.23 | 6.68 | 4.05 | 3.69 | - | 28.63 | 4.77 | 38.4 |
| African | 7.31 | 8.16 | 7.15 | 3.98 | - | - | 26.60 | 4.43 | 30.8 |
| Average | 7.92 | 8.52 | 8.03 | 5.64 | 5.56 | 5.34 | | | |
| LSD, 5% | 0.71 | 0.92 | 0.76 | 1.35 | 0.86 | 0.74 | | | |
| C. V., % | 6.2 | 7.5 | 6.7 | 14.3 | 10.7 | 9.5 | | | |

Footnotes

1. Yield data are totals of four cuttings per year.
2. Data are means of four replications.

1965 seeding

Twenty-five alfalfas were broadcast-seeded in April at 10 pounds of pure live seed per acre. Three varieties that had performed well in previous trials, DuPuits, Talent, and Lahontan, representing short, medium, and long-rotation types, were included as standards for comparison. Six of the alfalfas, Mustang, Nevada selections H-7, H-20, and H-21, N3-515, and N3-516 were 2-clone synthetics or hybrids. The planting was continued through five production years. Table 2 presents yield data obtained during the course of the trial.

Stands and yields of the Flemish types Alfa, Cardinal, DuPuits, Flandria, Glacier, and N3-510 declined sharply after three years because of their susceptibility to bacterial wilt. Talent remained quite productive for four years, and

several Flemish types with higher levels of bacterial wilt resistance remained productive longer. Saranac remained vigorous and very productive at the end of the test period.

Table 2. Yields of alfalfa varieties and experimental selections, 1966-1970, seeded in 1965 at the Southern Oregon Experiment Station, Medford

| Variety | Oven-dry hay, tons per acre | | | | | Total | Average |
|------------|-----------------------------|------|------|----------|----------|-------|---------|
| | 1966 | 1967 | 1968 | 1969 | 1970 | | |
| Saranac | 7.33 | 8.31 | 9.36 | 8.43 | 7.53 | 40.96 | 8.19 |
| Haymor | 7.68 | 8.31 | 8.99 | 7.88 | 6.76 | 39.62 | 7.92 |
| Resistador | 7.54 | 8.54 | 8.63 | 7.77 | 6.99 | 39.47 | 7.89 |
| Mustang | 7.18 | 8.13 | 8.78 | 8.53 | 6.72 | 39.34 | 7.87 |
| Cayuga | 6.96 | 8.01 | 9.01 | 8.07 | 6.91 | 38.96 | 7.79 |
| WL 302 | 7.39 | 8.52 | 9.01 | 7.61 | 6.25 | 38.78 | 7.76 |
| Washoe | 6.52 | 7.93 | 8.83 | 7.65 | 7.09 | 38.02 | 7.60 |
| Culver | 7.28 | 7.83 | 8.66 | 7.33 | 6.61 | 37.71 | 7.54 |
| Vernal | 6.52 | 7.20 | 8.78 | 7.92 | 7.13 | 37.55 | 7.51 |
| N3-515 | 7.13 | 7.77 | 8.65 | 7.38 | 5.52 | 36.45 | 7.29 |
| H-2, Nev. | 6.36 | 7.85 | 8.16 | 7.07 | 6.82 | 36.26 | 7.25 |
| H-7, Nev. | 6.13 | 7.58 | 7.93 | 7.16 | 6.93 | 35.73 | 7.15 |
| Eldorado | 6.44 | 7.73 | 7.76 | 7.31 | 6.45 | 35.71 | 7.14 |
| KS 10 | 6.65 | 7.48 | 8.51 | 6.71 | 5.21 | 34.56 | 6.91 |
| Talent | 5.68 | 8.00 | 8.03 | 7.01 | 5.77 | 34.49 | 6.90 |
| Zia | 6.13 | 7.62 | 7.89 | 6.80 | 5.80 | 34.24 | 6.85 |
| N3-516 | 6.55 | 7.98 | 8.13 | 6.38 | 5.13 | 34.17 | 6.83 |
| Lahontan | 6.00 | 7.49 | 7.87 | 6.62 | 6.16 | 34.14 | 6.83 |
| H-21, Nev. | 5.63 | 7.62 | 7.35 | 6.46 | 6.19 | 33.25 | 6.65 |
| Cardinal | 7.54 | 8.69 | 8.01 | 5.35 | no stand | 29.59 | |
| N3-510 | 7.21 | 8.81 | 8.11 | 5.44 | no stand | 29.57 | |
| Alfa | 7.60 | 8.67 | 7.95 | 5.07 | no stand | 29.29 | |
| Glacier | 7.57 | 8.54 | 7.96 | 4.79 | no stand | 28.86 | |
| DuPuits | 7.62 | 8.23 | 7.61 | 4.15 | no stand | 27.61 | |
| Flandria | 7.35 | 8.61 | 6.84 | no stand | - | 22.80 | |
| Average | 6.88 | 8.06 | 8.27 | 6.60 | 6.42 | | |
| LSD, 5% | 0.54 | 0.52 | 1.06 | 0.91 | 0.75 | | |
| C. V., % | 6.8 | 4.6 | 9.1 | 9.4 | 8.4 | | |

Footnotes

1. Data are totals of four cuttings per year.
2. Each data figure is the mean of four replications.

Several other alfalfas with high levels of bacterial wilt resistance that yielded well over the course of the trial were Resistador, Mustang, Cayuga, Washoe, Culver, and Vernal. Those with the fullest stands after five years

were Nevada selections H-7, H-20, and H-21, Saranac, and Washoe. Those with stands rated as satisfactory were Cayuga, Culver, Lahontan, Vernal, and Zia.

Crude protein data are shown in Table 3 for the 1966 crop year. Differences among cuttings were much greater than among varieties. First cutting values averaged 15.8 percent, considerably less than the other three because the growth was taller and stems were larger than in alfalfa of the later cuttings. Second and third cutting protein values were 19.6 and 19.0 percent, respectively. Fourth cutting growth was very leafy and fine-stemmed with protein values averaging 22.2 percent, but yields were low, averaging only 1.01 tons per acre or 14.7 percent of the seasonal total production.

Table 3. Crude protein content of alfalfa varieties, by cuttings, 1966 season at the Southern Oregon Experiment Station

| Variety | Crude protein percent, oven-dry basis | | | |
|------------|---------------------------------------|---------|---------|---------|
| | 1st cut | 2nd cut | 3rd cut | 4th cut |
| Saranac | 15.9 | 18.2 | 18.5 | 23.2 |
| Haymor | 16.0 | 19.0 | 18.5 | 21.4 |
| Resistador | 15.2 | 18.8 | 17.9 | 21.5 |
| Mustang | 16.5 | 20.7 | 18.7 | 22.2 |
| Cayuga | 16.0 | 20.2 | 19.0 | 20.5 |
| WL 302 | 15.6 | 20.2 | 18.2 | 22.5 |
| Washoe | - | 20.5 | 19.7 | 22.1 |
| Culver | 17.0 | 19.2 | 20.4 | 24.4 |
| Vernal | 16.4 | 22.0 | 20.9 | 25.2 |
| N3-515 | - | 19.7 | 19.2 | 23.2 |
| H-20, Nev. | 16.0 | 20.2 | 18.9 | 22.7 |
| H-7, Nev. | 15.8 | 18.2 | 19.4 | 22.0 |
| Eldorado | 14.6 | 19.5 | 18.1 | 21.7 |
| KS 10 | 16.2 | 19.0 | 20.2 | 22.9 |
| Talent | 15.4 | 18.7 | 20.5 | 22.0 |
| Lahontan | 16.3 | 18.7 | 16.5 | 21.0 |
| Zia | 16.1 | 18.6 | 19.2 | 17.3 |
| N3-516 | 16.4 | 20.7 | - | 24.5 |
| H-21, Nev. | 16.0 | 19.7 | - | 24.5 |
| Cardinal | 15.5 | 20.2 | 19.2 | 22.0 |
| N3-510 | 15.5 | 19.0 | 17.9 | 20.3 |
| Alfa | 14.3 | 19.2 | 20.5 | 24.0 |
| Glacier | 16.2 | 20.3 | 17.0 | 22.6 |
| DuPuits | 15.2 | 20.2 | 18.5 | 20.2 |
| Flandria | 14.2 | 18.5 | 19.2 | 20.2 |
| Average | 15.8 | 19.6 | 19.0 | 22.2 |

In this trial, Saranac, Vernal, Washoe, Resistador, Haymor, Cayuga, and Mustang could be considered as long-rotation alfalfas because of their good yields in the fifth year, their overall five-year production totals, and their satisfactory stands at the end of the test period.

1968 seeding

Twenty-three alfalfas were seeded April 24 in a trial that included Talent, Lahontan, and Resistador as standards, with the other entries being new to the area. Yield data were obtained from 1969 through 1973 with final stand ratings being made in the spring of 1974. Table 4 presents data from the trial.

As in previous trials, yields of hay during the first two production years were high although differences among varieties were seen. Europa and Orca, two Flemish types, had large stems and were very resistant to lodging in the first crop. By the start of the third year, stand thinning because of bacterial wilt was apparent in susceptible Flemish varieties such as Europa, Orca, PAT 30, Apalachee, and Columbia 67. In the fourth year, stand declines were evident in Talent, MW 67-3, WL 303, MW 67-4, WL 210, and Tempo.

Table 4. Yield data, 1969-1973, and stand estimates of alfalfa varieties seeded in 1968 at the Southern Oregon Experiment Station, Medford

| Variety | Oven-dry hay in tons per acre | | | | | | Percent Stand | | |
|-------------|-------------------------------|------|------|----------|------|-------|---------------|------|------|
| | 1969 | 1970 | 1971 | 1972 | 1973 | Total | Average | 1973 | 1974 |
| N6-614 | 7.47 | 8.69 | 7.06 | 7.82 | 8.26 | 39.30 | 7.86 | 77 | 69 |
| WL 305 | 7.57 | 8.53 | 6.85 | 7.48 | 8.03 | 38.46 | 7.69 | 56 | 42 |
| Tempo | 7.72 | 8.18 | 7.52 | 6.97 | 7.31 | 37.75 | 7.55 | 64 | 45 |
| Titan | 7.42 | 7.84 | 6.47 | 7.62 | 7.98 | 37.33 | 7.47 | 72 | 57 |
| WL 210 | 7.47 | 7.72 | 6.78 | 7.56 | 7.70 | 37.23 | 7.45 | 65 | 36 |
| N-74 | 7.70 | 8.08 | 6.59 | 6.73 | 8.00 | 37.10 | 7.42 | 72 | 62 |
| MW 67-4 | 7.90 | 8.20 | 7.02 | 6.54 | 6.95 | 36.41 | 7.28 | 51 | 45 |
| WL 303 | 8.13 | 8.75 | 7.05 | 6.36 | 6.11 | 36.40 | 7.28 | 31 | 29 |
| N-73 | 7.35 | 7.93 | 6.87 | 6.68 | 7.13 | 35.96 | 7.19 | 50 | 40 |
| Nema | 7.85 | 7.82 | 6.71 | 6.11 | 7.31 | 35.80 | 7.16 | 56 | 56 |
| Resistador | 7.81 | 7.96 | 6.74 | 6.17 | 6.95 | 35.63 | 7.13 | 52 | 52 |
| Thor | 7.91 | 7.50 | 6.44 | 6.76 | 6.56 | 35.17 | 7.03 | 59 | 51 |
| Scout | 7.34 | 7.72 | 6.19 | 6.20 | 7.14 | 34.59 | 6.92 | 52 | 27 |
| Lahontan | 6.68 | 7.73 | 6.26 | 6.25 | 7.58 | 34.50 | 6.90 | 75 | 70 |
| WL 304 | 8.42 | 8.44 | 6.35 | 5.48 | 5.79 | 34.48 | 6.90 | 16 | 14 |
| Apex | 7.89 | 8.19 | 6.74 | 5.66 | 5.60 | 34.08 | 6.82 | 25 | 25 |
| MW 67-3 | 7.99 | 8.42 | 6.87 | 5.43 | 4.82 | 33.53 | 6.71 | 27 | 24 |
| PAT 30 | 8.50 | 7.81 | 5.51 | 5.40 | 5.43 | 32.65 | 6.53 | 11 | 9 |
| Columbia 67 | 7.69 | 7.24 | 6.26 | 5.08 | 5.57 | 31.84 | 6.37 | 15 | 7 |
| Talent | 6.98 | 7.87 | 6.44 | 5.14 | 5.13 | 31.56 | 6.31 | 14 | 14 |
| Apalachee | 7.81 | 7.78 | 5.93 | 4.58 | 4.59 | 30.69 | 6.14 | 10 | 12 |
| Orca | 8.28 | 8.20 | 4.77 | no stand | | 21.25 | 4.25 | 0 | 0 |
| Europa | 8.34 | 7.98 | 4.77 | no stand | | 21.09 | 4.22 | 0 | 0 |
| Average | 7.68 | 7.99 | 6.42 | 6.24 | 6.60 | 34.93 | 6.99 | | |
| LSD, 5% | 0.71 | 0.79 | 0.76 | 0.63 | 0.76 | | | | |
| C. V., % | 6.6 | 8.0 | 8.4 | 7.1 | 8.1 | | | | |

Footnotes

1. Yield data are totals of four cuttings per year.
2. Percent stand is an estimate of the percent of the original, mature plants remaining as observed after spring growth started.

It was noted that yields of hay did not decline as rapidly as stands, probably because original, mature stands often have more plants than are needed, and remaining plants become larger or send up more tillers and become more stemmy. Lahontan had the highest percentage of plants remaining in 1974 although its cumulative yield was less than several other alfalfas.

Several alfalfas remained highly productive in 1973, the final year yields were measured. Experimental selection N6-614 and N-74 were very productive and maintained strong stands. Titan and Nema had relatively good stands while Tempo, WL 305, WL 210, N-73, Scout, Resistador, and Thor remained productive although with slightly lower percentages of original stands remaining.

It was observed in previous trials and reaffirmed in this one that as stands of alfalfa thin, recommended selective rates of herbicides such as simazine and diuron fail to control weeds adequately. The competitive effect of a strong, vigorous alfalfa stand is essential to help make chemical weed control successful.

1970 seeding

Twenty-three alfalfas, including many new entries, were seeded in 1970. Most were expected to have considerable tolerance or resistance to bacterial wilt disease. An objective was to find varieties with production equal to the short rotation types in the first two or three years of stand life, but with the ability to maintain good stands and high production levels for at least five years.

Apalachee, PAT 30, Talent, and Team were very productive for two years, but stand thinning from bacterial wilt was responsible for yield declines beginning in the second and third years. Among those with the fullest stands remaining in the fifth year were AS 49, Vernal, Resistador, Saranac, Weevlchek, Anchor, WL 214, and WL 308. Table 5 presents yield data and stand estimates for the trial.

Many of the alfalfas remained quite productive through a five-year period. Fifteen produced more than six tons of oven-dry hay per acre in the fifth year even though some rather sharp stand declines occurred between the fourth and fifth years.

Atra 55, WL 308, Anchor, and Saranac had the highest cumulative yield totals over the test period, producing totals of 39.79, 39.40, 39.18, and 38.68 tons of oven-dry hay per acre, respectively. The reference variety Talent produced 31.50 tons of hay per acre over the same period. The data indicate there are a number of alfalfas that possess sufficient resistance to bacterial wilt and are well enough adapted to the area to be productive of hay through a long rotation.

Table 5. Yield data and stand estimates, alfalfa varieties, 1971-1975, seeded in 1970, Southern Oregon Experiment Station, Medford

| Variety | Oven-dry hay, tons per acre | | | | | | Percent Stand | | |
|------------|-----------------------------|------|------|------|------|-------|---------------|------|------|
| | 1971 | 1972 | 1973 | 1974 | 1975 | Total | Average | 1974 | 1975 |
| Atra 55 | 8.32 | 9.26 | 8.88 | 7.15 | 6.18 | 39.79 | 7.96 | 62 | 39 |
| WL 308 | 8.19 | 8.85 | 8.51 | 7.38 | 6.47 | 39.40 | 7.88 | 65 | 42 |
| Anchor | 7.65 | 9.09 | 8.68 | 7.39 | 6.37 | 39.18 | 7.84 | 69 | 45 |
| Saranac | 7.72 | 9.00 | 8.57 | 6.88 | 6.51 | 38.68 | 7.74 | 65 | 49 |
| WL 214 | 7.42 | 8.62 | 8.56 | 7.08 | 6.46 | 38.14 | 7.63 | 64 | 44 |
| Vernal | 7.33 | 8.47 | 8.30 | 7.29 | 6.52 | 37.91 | 7.58 | 76 | 55 |
| Superstan | 7.15 | 9.23 | 8.45 | 6.71 | 6.28 | 37.82 | 7.56 | 70 | 39 |
| WL 306 | 7.91 | 8.41 | 8.14 | 6.75 | 6.29 | 37.50 | 7.50 | 57 | 37 |
| N-102 | 7.71 | 8.70 | 7.75 | 6.27 | 6.60 | 37.03 | 7.41 | 59 | 37 |
| TX 805 | 8.16 | 8.44 | 7.75 | 6.38 | 6.02 | 36.75 | 7.35 | 49 | 27 |
| Tempo | 8.07 | 8.88 | 7.78 | 6.17 | 5.72 | 36.62 | 7.32 | 55 | 32 |
| AS 63 | 7.15 | 8.58 | 8.09 | 6.48 | 6.28 | 36.58 | 7.32 | 64 | 36 |
| MX 82 | 7.69 | 8.42 | 7.56 | 6.52 | 6.32 | 36.51 | 7.30 | 47 | 36 |
| AS 49 | 7.09 | 7.35 | 8.38 | 6.89 | 6.65 | 36.36 | 7.27 | 72 | 62 |
| Resistador | 7.61 | 7.82 | 7.94 | 6.72 | 6.23 | 36.32 | 7.26 | 67 | 51 |
| Weevlchek | 7.51 | 8.52 | 8.08 | 6.26 | 5.87 | 36.24 | 7.25 | 70 | 47 |
| WL 303 | 8.04 | 8.66 | 7.42 | 5.60 | 5.82 | 35.54 | 7.11 | 45 | 30 |
| MX 45 | 7.87 | 8.56 | 7.22 | 5.75 | 6.09 | 35.49 | 7.10 | 49 | 26 |
| AS 13 | 7.27 | 7.13 | 7.33 | 5.67 | 5.88 | 33.28 | 6.66 | 41 | 13 |
| Talent | 7.28 | 7.89 | 6.15 | 4.91 | 5.27 | 31.50 | 6.30 | 21 | 14 |
| Team | 7.84 | 8.48 | 5.98 | 3.94 | 3.96 | 30.20 | 6.04 | 20 | 14 |
| PAT 30 | 8.03 | 6.71 | 4.00 | 3.98 | 4.68 | 27.40 | 5.48 | 9 | 11 |
| Apalachee | 8.13 | 7.30 | 4.44 | 3.99 | 3.09 | 26.95 | 5.39 | 9 | 8 |
| Average | 7.71 | 8.36 | 7.56 | 6.18 | 5.89 | 35.70 | 7.14 | | |
| LSD, 5% | 0.63 | 0.58 | 0.78 | 0.84 | 0.66 | | | | |
| C. V., % | 5.8 | 4.9 | 7.6 | 7.2 | 8.0 | | | | |

Footnotes

1. Yield data are totals of four cuttings per year.
2. Data are means of four replications.
3. Percent stand is an estimate of the percentage of the original, mature plants remaining as observed after growth started in the spring.

1973 seeding

Several of the 22 alfalfas in this trial were selected because of their reported tolerance to *Phytophthora* root rot. Included in the group are AS 49, DK 167, Resistador II, Lahontan, Washoe, WL 307, and WL 311. Three years of production data have been obtained although the trial is still in progress. Yield data are shown in Table 6.

Table 6. Yields of alfalfa hay, 1974-1976, grown from a 1973 seeding at the Southern Oregon Experiment Station, Medford

| Variety | Oven-dry hay, tons per acre | | | | Average |
|---------------|-----------------------------|------|------|-------|---------|
| | 1974 | 1975 | 1976 | Total | |
| WL 307 | 7.44 | 7.94 | 6.20 | 21.58 | 7.19 |
| WL 311 | 7.66 | 7.82 | 5.88 | 21.36 | 7.12 |
| WL 309 | 7.34 | 7.81 | 5.92 | 21.07 | 7.02 |
| WL 310 | 7.19 | 8.08 | 5.70 | 20.97 | 6.99 |
| Thor | 7.87 | 7.56 | 5.51 | 20.94 | 6.98 |
| Vista | 7.40 | 7.77 | 5.77 | 20.94 | 6.98 |
| Citation | 7.67 | 7.30 | 5.71 | 20.68 | 6.89 |
| Talent | 7.36 | 7.89 | 5.41 | 20.66 | 6.89 |
| Saranac | 7.32 | 7.50 | 5.82 | 20.64 | 6.88 |
| Washoe | 7.48 | 7.46 | 5.69 | 20.63 | 6.88 |
| Gladiator | 7.38 | 7.30 | 5.64 | 20.32 | 6.77 |
| Resistador II | 7.21 | 7.55 | 5.55 | 20.31 | 6.77 |
| DK 131 | 7.19 | 7.33 | 5.62 | 20.14 | 6.71 |
| DK 167 | 6.76 | 7.81 | 5.46 | 20.03 | 6.68 |
| Bonus | 6.77 | 7.04 | 5.73 | 19.54 | 6.51 |
| N7-5 | 7.03 | 6.92 | 5.47 | 19.42 | 6.47 |
| AS 49 | 7.04 | 6.95 | 5.36 | 19.35 | 6.45 |
| KS-610 | 6.34 | 7.56 | 5.23 | 19.13 | 6.38 |
| Nugget | 7.07 | 6.88 | 5.14 | 19.09 | 6.36 |
| Vernal | 6.88 | 6.80 | 5.41 | 19.09 | 6.36 |
| Lahontan | 6.81 | 6.95 | 5.12 | 18.88 | 6.29 |
| Spredor | 5.66 | 5.42 | 4.29 | 15.37 | 5.12 |
| Average | 7.14 | 7.35 | 5.53 | | |
| LSD, 5% | 0.49 | 0.60 | 0.38 | | |
| C. V., % | 4.9 | 5.7 | 4.8 | | |

Footnotes

1. Yields are totals of four cuttings per year.
2. North American Plant Breeders is the developer of Nugget; Pfister Associated Growers is the marketer.

Stands remained good through the third year since all are reportedly quite tolerant or resistant to bacterial wilt except Talent, an intermediate rotation type. The yields of most entries have been rather closely grouped because of the strong, vigorous stands. Lahontan and Vernal are below many of the others in yields of hay after three years but because of the persistence of their stands, observed in previous trials, they usually compare more favorably with other alfalfas in the fourth and fifth years of a trial. Average yields of hay in 1976 were much lower than in the previous two years because weather conditions were not conducive to high yields. Stand thinning is expected to exert greater influence on yields as root diseases become more pronounced in the next two production years.

SUMMARY

Five plantings of alfalfas made at the Southern Oregon Experiment Station since 1959 were used to evaluate more than 80 varieties and experimental selections that might be adapted for production in Jackson, Josephine, and Douglas counties of southern Oregon. Yields of hay and disease resistance, as indicated by vigor and persistence of stands, were used as measurement criteria.

Management practices recommended to growers were followed as nearly as possible in testing the soil, applying fertilizers, inoculating the seed, rolling the seedbed after broadcasting or drilling the seed, applying herbicides registered for the crop, irrigating, harvesting at the late bud to early bloom stage of maturity, and allowing fall regrowth to replenish carbohydrate reserves in the root systems.

Varieties were found in each trial which maintained satisfactory stands and high levels of production for at least five years. Among those were Anchor, AS 49, Cayuga, Culver, Lahontan, Mustang, Nema, N-74, Orestan, Resistador, Saranac, Titan, Vernal, Washoe, Thor, Weevlchek, WL 210, WL 214, WL 305, WL 306, WL 308, and Zia. They are sufficiently resistant to bacterial wilt, the principal root disease affecting alfalfa in southern Oregon, to be used for long-rotation plantings. The increased value of the hay from the most productive alfalfas over those lacking adequate bacterial wilt resistance can amount to \$750 per acre over a production period of five years at a current hay price of \$75 per ton.

Alfalfas with various levels of tolerance to *Phytophthora* root rot are being evaluated in current trials. They are potentially adapted for use on some of the heavier, less well-drained soils of the area.