The 2023 **New Mexico Alfalfa Variety** Test Report

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Agricultural Experiment Station
College of Agricultural, Consumer and Environmental Sciences

The 2023 New Mexico Alfalfa Variety Test Report

Leonard Lauriault, Ian Ray, Chris Pierce, Koffi Djaman, Robert Flynn, Mark Marsalis, Charles Havlik, and Margaret West[1]

Introduction

In 2023, 145,000 acres of alfalfa (*Medicago sativa*) were in production in New Mexico, which was a 20,000-acre increase from 2022. Alfalfa hay production was estimated at 783,000 tons. At a 2023 average of $304 per ton (up from $267 per ton in 2022), estimated gross returns from alfalfa hay produced in 2023 will total over $238 million, which is a 28% increase from 2022. Besides its value for hay, alfalfa also is the legume of choice in irrigated perennial pastures. Whether used as pasture or hay, the value of alfalfa to New Mexico is greatly magnified by its contribution to livestock production and receipts from the sale of meat, milk, and other products generated by livestock enterprises.

Choosing a good alfalfa variety is a key step in establishing a highly productive stand of alfalfa, whether for hay or pasture. Differences between the highest- and lowest-yielding varieties in established irrigated tests included in this report ranged from 0.98 to 2.00 tons per acre in 2023. If sold as hay, this translates to a potential difference in returns of $298 to $608 per acre due to variety, or an increase of at least $43 million for the industry in 2023 alone.

This report, which is a collaborative effort of New Mexico State University (NMSU) scientists at agricultural science centers throughout the state, provides yield data for alfalfa varieties included in yield trials in New Mexico. While consistently high yields compared to other varieties over a number of years and locations within a region is the best indication of varietal adaptation and persistence, other factors should be considered in the variety selection process (see NMSU's Cooperative Extension Service Circular 654, Selecting alfalfa varieties for New Mexico). In addition to fall dormancy and winter hardiness, high levels of pest resistance are critical to protecting an alfalfa stand for long-term production. Alfalfa grown in New Mexico should have at least a resistant (R) rating for bacterial wilt, Fusarium wilt, anthracnose, Phytophthora root rot, spotted alfalfa aphid, blue alfalfa aphid, pea aphid, stem nematode, and southern root-knot nematode. Seed quality also should be high. Selecting an alfalfa variety based on seed cost is a gamble producers often lose. To be assured of achieving a long-lasting, highly productive stand, buy either certified or Plant Variety Protected (PVP) seed, which guarantees the genetics and performance. The best choice of seed of any variety is one that was treated with a fungicide and nitrogen-fixing bacteria before it was bagged.

Description of Tests

Replicated alfalfa variety tests included in this report were conducted under research controls at NMSU's Agricultural Science Centers at Las Cruces (2019 & 2022, both full and terminated irrigation for some period), Los Lunas (2019), Tucumcari (2018), and Farmington (2020). No data were reported from a test planted in 2020 at Artesia. Weather data for 2023 and the long-term averages from all locations are presented in Table 1.

Yield data (on a dry matter basis) are presented in tables 2-8 Varieties are listed in order from highest to lowest average annual production. Yields are given by cutting for 2023 and by year for each production year. Statistical analyses were performed on all alfalfa yield data (including experimental entries) to determine if the apparent differences are truly due to variety or just to chance. The variety with the highest numerical yield in each column is marked with two asterisks (**), and those varieties not significantly different from that variety are marked with one asterisk (*). Those are the varieties from which to make an initial selection. Otherwise, to determine if two varieties are truly different, compare the difference between the two varieties to the Least Significant Difference (LSD) at the bottom of the column. If the difference is equal to or greater than the LSD, the varieties are truly different in yield when grown under the conditions at a given location. If NS is given for the LSD, there was no statistical difference between the highest and lowest yielding varieties. The Coefficient of Variation (CV), which is a measure of the variability of the data, is included for each column of means. Low variability (<20 percent) is desirable, and increased variability within a study results in higher CVs and larger LSDs. There might be a difference between previously published data and the data given in this publication for the same tests because of differences in the programs used for statistical analysis.

Table 9 summarizes information about proprietors, Roundup Ready genetics, fall dormancy, winter survival (measured in the northern United States), pest resistance, and yield performance across years and locations for all varieties currently included in NMSU's alfalfa variety testing program. For information about other varietal characteristics, such as grazing, salt, or traffic tolerance or GMO traits besides Roundup Ready® genetics, check the National Alfalfa and Forage Alliance website for the Alfalfa Variety Leaflet (https://www.alfalfa.org/varietyLeaflet.php). In Table 8, varieties are listed alphabetically by fall dormancy category. As in the data tables, the variety with the highest numerical yield in each column is marked with two asterisks (**), and those varieties not significantly different from that variety are marked with one asterisk (*). Remember good performance across several years and locations is the best indicator of broad adaptation, pest resistance, and persistence.

Seed labeled "common," "variety not stated," or "variety unknown", particularly that from other states, is of unknown genetic background and may or may not have the necessary disease or insect resistance. New Mexico Common and African Common seed used in all tests throughout the state has come from the same supplier and seed fields in New Mexico. Seed purchased from other dealers may or may not be of the same quality and performance.

Summary

Consistent production of high alfalfa yields is the result of selecting good varieties and implementing good management techniques. Soil fertility should be maintained at recommended levels based on soil tests,

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irrigation should be properly applied, weeds and insects should be controlled using appropriate cultural and/or chemical methods, and harvest management should allow sufficient time to restock root energy prior to winter. For dormant (FD 1 to 3) and semi-dormant (FD 4 to 6) varieties, a 6-week rest period before a dormancy-inducing freeze (27°F) is recommended to allow plants to replenish root reserves for winter survival and initiate spring growth, after which harvesting might be done either mechanically or by grazing. Non-dormant (FD 7 to 9) varieties also might benefit from this rest period. Removing fall growth is beneficial to reducing weevil populations the following year as eggs are laid in and overwinter in stems. Harvesting established stands at early bloom would result in 3 to 5 cuttings per year before initiation of the rest period in most areas of New Mexico. More dormant varieties might not produce yields that can be baled during the rest period; however, these can still be grazed. For additional information about alfalfa management, refer to the other NMSU Agricultural Experiment Station and Cooperative Extension Service publications listed in Table 10.

Table 1. Temperature and precipitation data for 2023 and the long-term averages for the New Mexico Alfalfa Variety Test locations.

Location Elevation Latitude	Las Cruces[1] 3832 ft. 32° 12' N				Artesia 3366 ft. 32° 45' N				Los Lunas 4840 ft. 34° 46' N				Tucumcari 4091 ft. 35° 12' N				Farmington 5640 ft. 36° 41' N			
	Temp. (°F)		Precip. (in.)		Temp. (°F)		Precip. (in.)		Temp. (°F)		Precip. (in.)		Temp. (°F)		Precip. (in.)		Temp. (°F)		Precip. (in.)	
Month	2023	Avg.	2023	Avg.	2023	Avg.	2023	Avg.	2023	Avg.	2023	Avg.	2023	Avg.	2023	Avg.	2023	Avg.	2023	Avg.
Nov-22	45	49	0.00	0.53	47	49	1.20	0.53	39	44	0.00	0.46	46	47	0.29	0.67	36	41	0.47	0.65
Dec-22	42	41	0.37	0.68	43	41	0.08	0.51	37	35	0.77	0.52	40	39	0.00	0.63	34	31	0.76	0.47
Jan-23	41	40	0.18	0.56	44	40	0.35	0.39	35	35	0.20	0.37	41	38	0.11	0.39	32	30	0.86	0.51
Feb-23	45	45	0.07	0.37	43	45	0.00	0.42	37	40	0.12	0.42	41	42	0.10	0.49	33	36	0.60	0.48
Mar-23	55	52	0.12	0.22	53	52	0.00	0.43	45	47	0.67	0.47	50	49	0.80	0.76	41	43	1.24	0.64
Apr-23	63	60	0.00	0.21	57	60	0.00	0.62	53	55	0.00	0.47	58	58	0.41	1.11	49	51	0.09	0.58
May-23	70	69	0.61	0.29	69	69	0.23	1.20	65	64	0.32	0.44	68	66	3.10	1.84	61	60	0.37	0.53
Jun-23	77	78	0.00	0.72	80	78	0.06	1.40	72	73	0.21	0.59	74	76	3.52	1.85	66	70	0.39	0.26
Jul-23	84	80	0.37	1.36	86	80	0.68	1.76	82	77	0.36	1.35	82	79	3.34	2.62	77	76	0.09	0.81
Aug-23	80	78	1.20	2.29	83	78	1.70	1.67	77	75	0.70	1.60	82	77	2.10	2.68	74	74	0.46	1.05
Sep-23	75	71	0.50	1.38	77	71	0.87	1.81	69	68	1.30	1.14	76	71	0.72	1.52	67	66	0.39	1.10
Oct-23	62	61	0.47	0.91	63	61	1.14	1.16	57	56	0.01	1.03	62	59	0.19	1.34	55	54	0.03	0.97
Annual	62	60	3.89	9.52	62	60	6.31	11.90	56	56	4.66	8.86	60	59	14.68	15.91	52	53	5.75	8.05

[1]Long-term averages for the Las Cruces test site are from the State University weather station, located approximately 5.5 miles to the north.

Table 2. Dry matter yields (tons/acre) of alfalfa varieties sown September 27, 2019, at NMSU's Leyendecker Plant Science Research Center at Las Cruces and flood-irrigated twice per cutting (normal irrigation)†.

Variety Name	2020 Total	2021 Total	2022 Total	2023 Harvests 2-Jun	30-Jun	26-Jul	31-Aug	6-Oct	6-Nov	2023 Total	4-Yr Average
SW9812	6.05**	6.83*	5.67**	0.88*	0.74*	0.60*	0.78*	0.65**	0.46	4.12*	5.77**
NM 1705PAR	5.56*	7.11**	5.53*	0.82*	0.72*	0.60*	0.75*	0.62*	0.42	3.93*	5.54*
TMA 990	5.81*	6.52*	5.33*	0.80*	0.71*	0.64*	0.79**	0.63*	0.50**	4.08*	5.45*
SW9813	5.86*	6.79*	5.26*	0.72	0.61	0.53	0.70*	0.59*	0.43	3.57*	5.45*
SW8888	5.73*	6.61*	5.27*	0.83*	0.67	0.58*	0.74*	0.61*	0.40	3.83*	5.44*
Dona Ana	5.26*	6.91*	5.62*	0.89**	0.78**	0.65**	0.78*	0.63*	0.44	4.17**	5.37*
NM 1703PAR	5.95*	6.76*	5.15*	0.75	0.66	0.55*	0.70*	0.59*	0.41	3.67*	5.31*
AmeriStand 803T	5.91*	6.45*	5.17*	0.78*	0.67	0.57*	0.73*	0.59*	0.43	3.76*	5.30*
Mesquite	5.78*	6.51*	5.09*	0.71	0.61	0.53	0.68*	0.56	0.38	3.48	5.28*
NM 1701PAR	5.81*	6.52*	4.88*	0.77*	0.61	0.48	0.63	0.54	0.36	3.40	5.26*
SW1011	5.64*	6.78*	5.30*	0.77*	0.65	0.54	0.65	0.53	0.38	3.53	5.25*
SW9720	5.74*	6.65*	5.03*	0.74	0.61	0.49	0.65	0.54	0.39	3.43	5.16
NM 1704PAR	6.01*	6.40*	4.67	0.74	0.61	0.50	0.64	0.56	0.36	3.42	5.14
SW8421S	5.47*	6.38*	4.98*	0.75	0.63	0.54	0.69*	0.59*	0.41	3.60*	5.09
NM 170506PAR	5.53*	6.40*	4.94*	0.78*	0.67	0.54	0.70*	0.59*	0.41	3.69*	5.06
NuMex Bill Melton	5.19*	6.41*	4.91*	0.80*	0.60	0.49	0.65	0.56	0.39	3.49	5.01
AFX 917	5.11*	6.25	5.28*	0.82*	0.68*	0.55*	0.69*	0.61*	0.46	3.83*	5.00
AFX 779	5.58*	6.18	4.81	0.74	0.61	0.49	0.62	0.54	0.36	3.35	4.94
NM 1702PAR	5.43*	5.70	4.19	0.64	0.51	0.46	0.59	0.51	0.34	3.06	4.65
NM 1712PAR	5.60*	5.50	3.69	0.57	0.46	0.37	0.48	0.43	0.26	2.55	4.40
NM 1713PAR	4.93*	5.01	3.65	0.64	0.47	0.36	0.43	0.40	0.21	2.53	4.07
NM 1715PAR	4.89*	5.10	3.39	0.54	0.41	0.32	0.41	0.36	0.17	2.21	3.81
Mean	5.58	6.35	4.90	0.75	0.62	0.52	0.66	0.56	0.38	3.49	5.08
LSD (0.05)	NS	0.85	0.84	0.14	0.11	0.11	0.12	0.09	0.08	0.62	0.59
CV%	9.80	9.51	12.21	12.92	12.90	15.02	13.18	12.13	15.85	12.71	16.65

†Data were analyzed using analysis of covariance where check plots of NuMex Bill Melton were used as the covariate.

2020 Harvest dates: 19-Jun, 22-Jul, 21-Aug, 15-Sep, 19-Oct, and 17-Nov.

2021 Harvest dates: 1-May, 27-May, 24-Jun, 22-Jul, 27-Aug, 29-Sep, and 12-Nov.

2022 Harvest dates: 28-Apr, 1-Jun, 30-Jun, 27-Jul, 2-Sep, and 21-Oct.

2023 Inadvertent swathing prior to the first harvest on 29-Apr.

**Highest numerical value in the column.

*Not significantly different from the second highest numerical value in the column based on the 5% LSD.

NS means that there were no significant differences between the varieties within that column at the 5% level.

Table 3. Dry matter yields (tons/acre) of alfalfa varieties sown September 28, 2019, at NMSU's Leyendecker Plant Science Research Center at Las Cruces and flood-irrigated twice per cutting through July and resuming in mid-September through October (summer irrigation termination)†.

Variety Name	2020 Total	2021 Total	2022 Total	2023 Harvests 2-Jun	1-Jul	27-Jul	6-Oct	7-Nov	2023 Total	4-yr Average
Dona Ana	4.07**	5.08*	4.16*	1.22**	1.15**	0.28*	0.67**	0.53	3.86**	4.31**
SW8421S	4.03*	5.33*	4.18*	1.06	1.04*	0.29**	0.58	0.50	3.50*	4.27*
TMA 990	3.60*	5.31*	4.30*	1.17*	0.99	0.29**	0.67**	0.58**	3.68*	4.26*
SW9812	3.71*	5.42**	4.24*	1.12*	1.06*	0.28*	0.65*	0.52	3.63*	4.24*
NM 170506PAR	3.60*	5.31*	4.36**	1.13*	1.08*	0.27*	0.62*	0.49	3.59*	4.23*
SW9813	3.89*	5.28*	4.10*	1.04	1.00	0.28*	0.59	0.47	3.39	4.17*
NM 1703PAR	3.80*	5.39*	4.12*	1.05	0.98	0.27*	0.58	0.45	3.31	4.17*
AFX 779	4.04*	5.23*	3.98*	1.09	1.04*	0.24*	0.56	0.42	3.37	4.16*
AmeriStand 803T	3.69*	5.12*	4.12*	1.04	0.97	0.29**	0.59	0.49	3.37	4.09*
SW9720	3.86*	5.14*	4.04*	1.03	0.94	0.27*	0.53	0.43	3.20	4.07*
NM 1704PAR	3.97*	5.29*	4.01*	1.02	0.92	0.21	0.53	0.40	3.09	4.06*
AFX 917 (149092)	3.69*	5.05*	3.99*	1.02	1.01	0.26*	0.59	0.50	3.39	4.03*
SW1011	3.49*	5.14*	4.13*	1.05	1.03	0.24*	0.56	0.46	3.33	4.03*
NM 1701PAR	3.47*	5.41*	4.17*	1.06	0.94	0.20	0.51	0.40	3.12	4.00*
NM 1705PAR	3.58*	5.22*	4.03*	0.97	0.94	0.26*	0.52	0.42	3.11	3.98
Mesquite	3.45*	5.11*	4.01*	1.02	0.95	0.25*	0.56	0.43	3.20	3.93
NM 1702PAR	3.62*	5.19*	3.99*	0.92	0.88	0.22*	0.54	0.41	2.94	3.93
NuMex Bill Melton	3.66*	4.94	3.85	1.01	0.91	0.21	0.50	0.40	3.03	3.85
SW8888	3.85*	4.84	3.47	0.99	0.93	0.21	0.48	0.37	2.98	3.79
NM 1712PAR	3.76*	4.68	3.45	0.91	0.79	0.15	0.37	0.28	2.50	3.58
NM 1715PAR	3.27*	4.47	3.30	0.80	0.74	0.10	0.35	0.23	2.24	3.30
NM 1713PAR	3.42*	4.30	3.21	0.83	0.72	0.11	0.35	0.23	2.24	3.28
Mean	3.71	5.10	3.96	1.03	0.96	0.24	0.54	0.43	3.18	3.99
LSD (0.05)	NS	0.42	0.40	0.12	0.12	0.08	0.07	0.04	0.38	0.32
CV%	8.71	5.83	7.21	8.08	9.04	24.70	9.46	7.42	8.50	11.42

†Data were analyzed using analysis of covariance where check plots of NuMex Bill Melton were used as the covariate.

2020 Harvest dates, 18-Jun, 21-Jul, and 17-Oct; first harvest data not collected due to COVID restrictions and there was insufficient growth for Aug and Sep harvests.

2021 Harvest dates, 30-Apr, 27-May, 30-Jun, 22-Jul, 26-Aug, and 11-Nov, with insufficient growth for Sep harvest.

2022 Harvest dates: 27-Apr, 1-Jun, 30-Jun, 27-Jul, 20-Oct, with insufficient growth for Aug and Sep harvests.

2023 Inadvertent swathing prior to the first harvest on 29-Apr. Insufficient growth for the Aug harvest.

**Highest numerical value in the column.

*Not significantly different from the second highest numerical value in the column based on the 5% LSD.

NS means that there were no significant differences between the varieties within that column at the 5% level.

Table 4. Dry matter yields (tons/acre) of alfalfa varieties sown October 5, 2022, at NMSU's Leyendecker Plant Science Research Center at Las Cruces and flood-irrigated twice per cutting (normal irrigation)†.

Variety Name	21-Apr	31-May	26-Jun	24-Jul	30-Aug	5-Oct	4-Nov	2023 Total
			2023 Harvests					
NM 2109	2.57**	1.63**	1.15**	0.97**	0.93**	0.95*	0.62*	8.81**
NM 2119	2.42*	1.54*	1.11*	0.96*	0.92*	0.96**	0.59*	8.49*
NM 1703PAR	2.45*	1.44*	1.05*	0.92*	0.91*	0.96*	0.66**	8.39*
NM 1705PAR	2.42*	1.52*	1.08*	0.93*	0.91*	0.91*	0.59*	8.37*
NM 2115	2.49*	1.59*	1.06*	0.90*	0.82	0.89*	0.55	8.30*
NM 2118	2.57*	1.50*	1.03*	0.85*	0.86*	0.88*	0.56	8.25*
NM 1704PAR	2.48*	1.50*	1.04*	0.85*	0.81	0.92*	0.59*	8.20*
NM 2114	2.50*	1.51*	1.02*	0.88*	0.82	0.91*	0.55	8.20*
AFX 917	2.37*	1.50*	1.06*	0.87*	0.86*	0.92*	0.58	8.18*
NM 2120	2.42*	1.54*	1.07*	0.87*	0.86*	0.90*	0.53	8.18*
NM 2106	2.25*	1.48*	1.06*	0.92*	0.91*	0.92*	0.62*	8.17*
NuMex Bill Melton	2.41*	1.49*	1.07*	0.86*	0.82	0.90*	0.52	8.07*
NM 2117	2.37*	1.42*	1.04*	0.87*	0.85*	0.89*	0.55	7.99*
SW9813S	2.33*	1.45*	1.02*	0.85*	0.83	0.89*	0.59*	7.96*
AmeriStand 803T	2.34*	1.51*	1.03*	0.84*	0.82	0.86*	0.54	7.96*
NM 2113	2.45*	1.50*	0.97*	0.83*	0.82	0.84*	0.49	7.91*
SW9812S	2.30*	1.47*	0.98*	0.80*	0.78	0.81*	0.54	7.68*
NM 2107	2.26*	1.43*	0.96*	0.81*	0.78	0.86*	0.55	7.65*
Mean	2.41	1.50	1.04	0.88	0.85	0.90	0.57	8.15
LSD (0.05)	NS	NS	NS	NS	0.10	NS	0.08	NS
CV%	6.46	6.90	8.06	8.59	7.90	8.40	10.12	6.31

†Data were analyzed using analysis of covariance where check plots of NuMex Bill Melton were used as the covariate.

**Highest numerical value in the column.

*Not significantly different from the second highest numerical value in the column based on the 5% LSD.

NS means that there were no significant differences between the varieties within that column at the 5% level.

Table 5. Dry matter yields (tons/acre) of alfalfa varieties sown October 4, 2022, at NMSU's Leyendecker Plant Science Research Center at Las Cruces and flood-irrigated twice per cutting through mid-June and resuming in February of the following year (early irrigation termination)†.

Variety Name	2023 Harvests			2023 Total
	24-Apr	31-May	27-Jun	
NM 1704PAR	3.48**	1.80*	1.17*	6.44**
NM 2109	2.94*	2.00**	1.28**	6.18*
NM 2115	2.95*	1.97*	1.23*	6.15*
NM 2114	2.99*	1.90*	1.20*	6.10*
NM 2118	2.94*	1.95*	1.22*	6.09*
NM 2113	2.81*	1.98*	1.20*	5.97*
SW9813S	2.85*	1.93*	1.18*	5.97*
NM 2107	2.74*	1.99*	1.22*	5.95*
NuMex Bill Melton	2.76*	1.92*	1.22*	5.92*
AmeriStand 803T	2.77*	1.94*	1.17*	5.91*
NM 2120	2.88*	1.89*	1.14*	5.89*
AFX 917	2.72*	1.94*	1.21*	5.88*
NM 2119	2.75*	1.90*	1.20*	5.86*
SW9812S	2.74*	1.93*	1.18*	5.85*
NM 1703PAR	2.77*	1.81*	1.19*	5.75*
NM 2117	2.74*	1.76*	1.12*	5.64*
NM 2106	2.65*	1.80*	1.15*	5.60*
NM 2101	2.59*	1.75*	1.12*	5.46*
Mean	2.84	1.90	1.19	5.92
LSD (0.05)	NS	NS	NS	NS
CV%	14.41	6.53	7.14	8.06

†Data were analyzed using analysis of covariance where check plots of NuMex Bill Melton were used as the covariate.

2023 insufficient growth for harvests after 27-Jun.

**Highest numerical value in the column.

*Not significantly different from the second highest numerical value in the column based on the 5% LSD.

NS means that there were no significant differences between the varieties within that column at the 5% level.

Table 6. Dry matter yields (tons/acre) of flood-irrigated alfalfa varieties sown September 27, 2019, at NMSU's Agricultural Science Center at Los Lunas†.

Variety Name	2020 Total	2021 Total	2022 Total	2023 Harvests 17-May	14-Jun	21-Jul	6-Sep	26-Oct	2023 Total	4-Yr Average
AFX 779	11.71*	8.61	9.09*	1.70*	2.11**	2.19**	1.43	1.22	8.66**	9.51**
NM 1713PAR	11.42*	9.06*	8.31	1.81*	1.94*	1.95	1.35	1.16	8.21*	9.25*
Roadrunner	10.56	9.27**	9.27**	1.79*	1.84*	2.00	1.16	1.11	7.90	9.25*
NuMex Bill Melton	11.12*	8.98*	8.82*	1.42	1.95*	1.92	1.37	1.20	7.86	9.19*
SW7473	11.06*	8.90*	8.87*	1.43	1.90*	1.96	1.40	1.23	7.91	9.18*
NM 1704PAR	11.97**	8.61	8.33	1.56	1.89*	1.88	1.31	1.14	7.78	9.17*
NM 1712PAR	11.47*	8.91*	8.87*	1.52	1.90*	1.78	1.20	1.02	7.42	9.17*
NM 1715PAR	10.88	8.67	8.96*	1.73*	1.89*	1.94	1.22	1.06	7.85	9.09
Artesian Sunrise	10.53	8.77	8.79*	1.86**	1.97*	1.78	1.31	1.06	7.98	9.02
AmeriStand 715NTRR	11.32*	8.51	8.33	1.44	1.84*	1.97	1.36	1.20	7.81	8.99
NM Common	10.48	8.22	8.92*	1.26	2.07*	2.06*	1.52*	1.35*	8.25*	8.96
Zia	10.91	8.20	8.28	1.30	2.00*	2.09*	1.64**	1.37**	8.40*	8.95
WL 454HQ.RR	10.49	8.57	8.70	1.48	1.84*	1.82	1.26	1.20	7.59	8.84
WL 440HQ	10.16	8.28	8.76*	1.70*	1.93*	2.04*	1.28	1.16	8.10	8.83
Artesian Sun 6.3	9.91	8.55	8.68	1.56	1.86*	1.85	1.32	1.04	7.62	8.69
Dona Ana	10.08	8.31	8.10	1.37	1.90*	2.02*	1.55*	1.26	8.10	8.65
SW3407	10.03	8.14	8.40	1.73*	1.85*	1.82	1.32	1.02	7.73	8.58
AFX 469	9.85	8.16	8.16	1.44	1.80*	2.02*	1.28	1.11	7.64	8.45
Hi-Gest 660	9.76	8.00	8.14	1.48	1.93*	1.93	1.29	1.17	7.81	8.43
AFX 579	10.06	8.17	7.90	1.67*	1.70*	1.74	1.24	1.10	7.46	8.39
SW4107	9.06	8.49	8.36	1.60	1.82*	1.80	1.26	1.08	7.55	8.36
SW5511	9.16	8.01	8.28	1.57	1.79*	1.93	1.24	1.12	7.65	8.27
Mean	10.54	8.52	8.56	1.56	1.90	1.93	1.33	1.15	7.88	8.87
LSD (0.05)	1.06	0.43	0.56	0.21	NS	0.18	0.14	0.11	0.50	0.38
CV%	7.09	3.56	4.66	9.60	8.64	6.49	7.53	6.52	4.51	6.07

†Data were detrended using nearest neighbor analysis and analyzed using analysis of variance.

2020 Harvest dates: 9-Jun, 16-Jul, 8-Sep, and 2-Nov.

2021 Harvest dates: 26-May, 12-Jul, 26-Aug, and 21-Oct.

2022 Harvest dates: 24-May, 30-Jun, 31-Jul, 30-Aug, 13-Oct.

**Highest numerical value in the column.

*Not significantly different from the second highest numerical value in the column based on the 5% LSD.

NS means that there were no significant differences between the varieties at the 5% level.

Table 7. Dry matter yields (tons/acre) of alfalfa varieties sown September 14, 2018, at NMSU's Rex E. Kirksey Agricultural Science Center at Tucumcari and irrigated with treated municipal wastewater†.

Variety Name	2020 Total	2021 Total	2022 Total	2023 Harvests 12-Jun	2023 Harvests 23-Aug	2023 Total	4-Yr Average
Dona Ana	2.00*	2.33*	5.02*	1.87*	1.97*	3.84*	3.30**
SW7408	2.21**	2.26*	5.14**	1.82*	1.78*	3.60*	3.30**
Zia	2.11*	2.24*	4.94*	1.94*	1.82*	3.76*	3.26*
SW8476	2.06*	2.13*	4.95*	1.80*	1.96*	3.76*	3.22*
SW8412	1.96*	1.90	4.84*	1.91*	1.99*	3.90*	3.15*
SW8421S	1.78	1.80	4.88*	2.00*	1.95*	3.94**	3.10*
NM Common	1.74	1.99	4.83*	2.05**	1.81*	3.86*	3.10*
SW8409	1.91*	1.99	4.46*	1.92*	1.80*	3.73*	3.02*
African Common	2.15*	2.34**	4.20*	1.55*	1.86*	3.41*	3.02*
SW1509	1.68	1.71	4.50*	1.87*	2.04**	3.90*	2.95*
SW5210	1.86*	1.79	4.18*	1.99*	1.90*	3.88*	2.93*
Hi-Gest660	1.69	1.91	4.64*	1.70*	1.77*	3.48*	2.93*
HybriForce-3600	1.66	1.97	4.40*	1.81*	1.81*	3.61*	2.91*
SW7473	1.79	1.92	4.24*	1.68*	1.93*	3.61*	2.89*
SW1517	1.64	1.87	4.32*	1.86*	1.81*	3.67*	2.87*
Mean	1.88	2.01	4.63	1.85	1.88	3.73	3.06
LSD (0.05)	0.38	0.34	NS	NS	NS	NS	NS
CV%	14.01	11.99	15.61	11.10	12.14	8.49	16.27

†Data were detrended using nearest neighbor analysis and analyzed using analysis of variance.

No harvests were taken in 2019 due to harvesting equipment and irrigation system failures.

2020 Harvest dates: 13-Jul and 21-Oct (Irrigation system failures continued in 2020 that were exacerbated by parts availability issues due to COVID).

2021 Harvest dates: 28-Jul and 21-Sep (completely rainfed).

2022 Harvest dates: 7-Jul, 18-Aug, and 13-Sep; Growth from spring green-up through early June was grazed off by mule deer; no measurable growth occurred after 13-Sep.

2023: Equipment failure prevented July harvest; early spring, late summer, and autumn growth was continually grazed off by mule deer.

**Highest numerical value in the column.

*Not significantly different from the highest numerical value in the column based on the 5% LSD.

NS means that there were no significant differences between the varieties within that column at the 5% level.

Table 8. Dry matter yields (tons/acre) of sprinkler-irrigated alfalfa varieties sown August 20, 2020, at NMSU's Agricultural Science Center at Farmington†.

Variety Name	2021 Total	2022 Total	2023 Harvests 13-Jun	18-Jul	21-Aug	12-Oct	2023 Total	3-Yr Average
SW4506	6.22	13.88**	2.68*	2.60**	1.93**	1.18	8.38*	9.49**
SW4107	6.14	13.55*	3.08*	2.48*	1.93**	1.23	8.70*	9.46*
SW3407	6.81*	12.60*	3.20**	2.40*	1.93**	1.35*	8.88**	9.43*
NM 1715PAR	7.39**	12.50*	2.88*	2.13	1.68*	1.28	7.95	9.28*
Magnum 8	6.78*	12.78*	2.70*	2.28	1.88*	1.23	8.08	9.21*
SW4412Y	6.85*	12.28*	2.78*	2.35*	1.90*	1.18	8.20*	9.11*
AFX 469	6.06	12.65*	2.88*	2.45*	1.93**	1.25	8.50*	9.07*
Bar MSI	6.92*	11.83	3.05*	2.18	1.90*	1.20	8.33*	9.02*
NM Common	6.29	11.78	3.18*	2.38*	1.83*	1.48**	8.85*	8.97*
NM 1713PAR	6.68*	11.75	2.70*	2.15	1.65	1.25	7.75	8.73*
NM 1712PAR	6.33	11.80	2.63*	1.95	1.58	1.15	7.30	8.48
African Common	6.68*	11.13	2.88*	1.85	1.48	1.03	7.23	8.34
Dona Ana	6.12	10.30	3.08*	1.80	1.48	1.15	7.50	7.97
Zia	5.62	9.28	2.95*	1.35	1.25	0.83	6.38	7.09
Mean	6.49	12.01	2.90	2.17	1.74	1.20	8.00	8.83
LSD (0.05)	0.92	1.91	NS	0.36	0.26	0.19	0.78	0.83
CV%	9.88	11.12	15.99	11.77	10.45	10.86	6.82	11.37

†Data were analyzed using analysis of variance.
2021 Harvest dates: 19-Jun, 10-Aug, and 22-Sep.
2022 Harvest dates: 9-Jun, 21-Jul, 30-Aug, and 12-Oct.
**Highest numerical value in the column.
*Not significantly different from the highest numerical value in the column based on the 5% LSD.
NS means that there were no significant differences between the varieties within that column at the 5% level.

Table 9. Characteristics and performance of alfalfa varieties across years and tests in New Mexico.

Column key for yield/test section (left → right): Las Cruces 2019[2] Fully irrigated (F[3]) harvest years 20[4],21,22,23 | Las Cruces 2019 Summer-terminated (T) harvest years 20,21,22,23 | Las Cruces 2022 F (23) | Las Cruces 2022 T (23) | Artesia 2020 (21,22,23) | Los Lunas 2019 (20,21,22,23) | Tucumcari 2018 (19,20,21,22,23) | Farmington 2020 (21,22,23).

Vertical notes in table: "No data reported" (Las Cruces 2022 F & T); "No data reported" (Artesia 2020); "No data collected due to irrigation system and equipment breakdowns complicated by COVID" (between Los Lunas and Tucumcari).

Variety Name	Proprietor	RR	FD	WS	Or	BW	FW	AN	PRR	SAA	PA	BAA	SN	RKN
SW 3407	S & W Seeds		3	<2		HR	HR	HR	HR	R	R	n/r	R	n/r
AFX469	Alforex Seeds		4	1.5		HR	HR	HR	HR	R	MR	R	HR	n/r
BAR MS1	Barenbrug USA		4	1.8		HR	HR	HR	HR	n/r	R	n/r	R	n/r
Magnum 8	Dairyland Seed		4	2.0		HR	HR	HR	HR	R	MR	R	R	n/r
Roadrunner	Blue River Hybrids		4	2.0	Y	HR	HR	HR	HR	HR	LR	n/r	R	n/r
SW 1517	S & W Seeds		4	n/r		HR	HR	HR	HR	R	R	n/r	MR	n/r
SW 4107	S & W Seeds		4	<2		HR	HR	HR	HR	MR	R	n/r	R	n/r
SW 4412Y	S & W Seeds		4	2.0		HR	HR	HR	HR	R	HR	n/r	HR	n/r
SW 4506	S & W Seeds		4	n/r		HR	HR	HR	HR	R	HR	n/r	R	n/r
SW 5210	S & W Seeds		4	n/r		HR	HR	HR	HR	R	HR	n/r	HR	n/r
AFX579	Alforex Seeds		5	2.5		HR	HR	HR	HR	R	R	R	HR	n/r
NM1712PAR	New Mexico State University		5	n/r		n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r
NM1713PAR	New Mexico State University		5	n/r		n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r
NM1715PAR	New Mexico State University		5	n/r		n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r
SW 1509	S & W Seeds		5	n/r		HR	HR	HR	HR	R	R	n/r	R	n/r
SW 5511	S & W Seeds		5	n/r		HR	HR	HR	HR	n/r	HR	n/r	R	n/r
Zia	Roswell Seed		5	n/r		MR	MR	S	S	MR	S	S	n/r	n/r
Artesian Sun 6.3	Croplan Genetics		6	3.0		R	HR	HR	HR	n/r	HR	R	HR	n/r
Hi-Gest 660	Alforex Seeds		6	n/r		R	HR	HR	HR	HR	HR	R	HR	n/r
HybriForce-3600	Alforex Seeds		6	n/r		n/r	n/r	n/r	n/r	n/r	n/r	HR	n/r	n/r
WL 440HQ	W-L Research		6	n/r		HR	HR	HR	HR	HR	HR	n/r	HR	HR
AFX 779	Alforex Seeds		7	n/r		R	R	R	R	HR	HR	HR	HR	n/r
Ameristand 715NTRR	America's Alfalfa	Y	7	n/r		R	HR	HR	HR	HR	HR	n/r	HR	n/r
Artesian Sunrise	Croplan Genetics		7	n/r		MR	HR	R	HR	HR	HR	R	R	n/r
Dona Ana	Roswell Seed		7	n/r		MR	MR	LR	R	MR	R	n/r	n/r	n/r
NM1701PAR	New Mexico State University		7	n/r		n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r
NM1702PAR	New Mexico State University		7	n/r		n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r
NM1704PAR	New Mexico State University		7	n/r		n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r
NM170506PAR	New Mexico State University		7	n/r		n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r
NuMex Bill Melton	New Mexico State University		7	n/r		MR	R	R	R	R	MR	MR	n/r	n/r
SW 7408	S & W Seeds		7	n/r		R	HR	HR	HR	HR	LR	R	MR	n/r
SW 7473	S & W Seeds		7	n/r		HR	HR	HR	HR	HR	HR	n/r	HR	n/r
WL 454HQ.RR	W-L Research	Y	7	n/r		R	HR	HR	HR	HR	HR	n/r	HR	n/r
Ameristand 803T	America's Alfalfa		8	n/r		MR	HR	MR	HR	R	R	n/r	HR	HR
Mesquite Brand	Helena Chemical, Mesquite, NM		8	nr		MR	HR	MR	HR	R	HR	n/r	HR	HR
NM1703PAR	New Mexico State University		8	n/r		n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r
NM1705PAR	New Mexico State University		8	n/r		n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r
SW 8409	S & W Seeds		8	n/r		HR	HR	HR	HR	HR	HR	n/r	R	n/r
SW 8412	S & W Seeds		8	n/r		HR	R	HR	HR	HR	HR	n/r	HR	n/r
SW 8421S	S & W Seeds		8	n/r		n/r	HR	LR	R	R	n/r	n/r	R	n/r
SW 8476	S & W Seeds		8	n/r		R	R	HR	HR	HR	HR	n/r	R	n/r
SW 8888	S & W Seeds		8	n/r		R	HR	HR	HR	HR	R	MR	R	n/r
AFX 917	Alforex Seeds		9	n/r		R	HR	HR	HR	HR	HR	HR	R	HR
SW 9720	S & W Seeds		9	n/r		n/r	n/r	n/r	n/r	R	n/r	n/r	R	n/r
SW 9812	S & W Seeds		9	n/r		R	R	LR	MR	R	R	R	HR	MR
SW 9812S	S & W Seeds		9	n/r		R	R	LR	MR	R	R	R	HR	MR
SW 9813	S & W Seeds		9	n/r		R	R	MR	R	R	R	HR	MR	n/r
SW 9813S	S & W Seeds		9	n/r		R	R	MR	R	R	R	HR	MR	n/r
TMA 990 Brand	DynaGro Seed		9	n/r		HR	HR	R	HR	R	R	n/r	R	n/r
SW 1011	S & W Seeds		10	n/r		MR	HR	LR	R	R	R	R	R	n/r
African Common	Roswell Seed		n/r	n/r		n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r
NM Common	Roswell Seed		n/r	n/r		n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r
NM2101	New Mexico State University		n/r	n/r		n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r
NM2101	New Mexico State University		n/r	n/r		n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r
NM2106	New Mexico State University		n/r	n/r		n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r
NM2107	New Mexico State University		n/r	n/r		n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r
NM2109	New Mexico State University		n/r	n/r		n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r
NM2113	New Mexico State University		n/r	n/r		n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r
NM2114	New Mexico State University		n/r	n/r		n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r
NM2115	New Mexico State University		n/r	n/r		n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r
NM2117	New Mexico State University		n/r	n/r		n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r
NM2118	New Mexico State University		n/r	n/r		n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r
NM2119	New Mexico State University		n/r	n/r		n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r
NM2120	New Mexico State University		n/r	n/r		n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r	n/r

Footnotes

[1] RR=Roundup Ready if "Y"; FD=Fall Dormancy (1 & 2 Very dormant; 3 & 4 Dormant; 5 Moderately dormant; 6 & 7 Semi-dormant; 8 & 9 Non-dormant; 10 & 11 Very non-dormant), WS=Winter Survival (1=No injury, 6=Dead plants), Or=Organically certified seed, BW=Bacterial wilt, FW=Fusarium wilt, AN=Anthracnose, PRR=Phytophthora root rot, SAA=Spotted alfalfa aphid, PA=Pea aphid, BAA=Blue alfalfa aphid, SN=Stem nematode, RKN=Rootknot nematode (southern); (S=Susceptible, LR=Low resistance, MR=Moderate resistance, R=Resistant, HR=High resistance, n/r indicates either that the variety was not rated for that characteristic or no rating was available).

[2] Establishment year.

[3] F=Fully irrigated; T=Summer irrigation terminated; check data tables for actual termination periods.

[4] Harvest year.

Shaded boxes indicate that the variety was not in the test.

** Highest yielding variety in the test for that year.

* Not significantly different from the highest yielding variety in the test for that year.

L.M. Lauriault, I.M. Ray, C.A. Pierce, K. Djaman, R.P. Flynn, M.A. Marsalis, C. Havlik, and M. West
New Mexico St. Univ. College of Agricultural, Consumer and Environmental Sciences. Agric. Exp. Stn and Coop. Ext. Ser.

Table 10. New Mexico State University Cooperative Extension Service publications related to alfalfa management.

Number	Title
A-123	Sampling for plant tissue analysis
A-129	Nitrogen fixation by legumes
A-130	Inoculation of legumes
A-131	Certified seed
A-137	Soil analysis: A key to soil nutrient management
A-145	Certified noxious weed free program
A-146	Appropriate analysis for New Mexico soils
A-229	Phymatotrichum root rot
A-325	Managing weeds in alfalfa
A-326	Downy mildew on alfalfa
A-333	User manual of the alfalfa yield predictor
A-334	Beet armyworm in New Mexico Hay
A-335	Variegated cutworm in New Mexico Hay
A-336	Managing Roundup Ready alfalfa and conventional or organic alfalfa hay in nearby fields in New Mexico
A-337	Recommendations for Roundup Ready alfalfa weed management and stand removal in New Mexico
A-338	Alfalfa weevil control options in New Mexico
A-339	Alfalfa integrated pest management: Aphids
A-615	Dodder (*Cuscuta ssp.*) biology and management
H-158	How to collect and send plant specimens for disease diagnosis
CR-536	Blister beetles in alfalfa
CR-586	Irrigated pasture management in New Mexico
CR-633	Using a computer application to predict irrigated alfalfa yield
CR-641	Hay quality, sampling and testing
CR-644	Assessing alfalfa stands after winter injury, freeze damage, or any time renovation is considered in New Mexico
CR-646	Managing alfalfa during drought
CR-654	Selecting alfalfa varieties for New Mexico
CR-659	Whitefringed beetle in New Mexico alfalfa
CR-668	Reducing harvest and post-harvest losses of alfalfa and other hay
CR 682	GMO Crops in New Mexico agriculture
CR-696	Perennial forage species for irrigated pastures and hay in New Mexico

These publications, and alfalfa variety test reports from previous years, are available from your county office of the NMSU Cooperative Extension Service or online at http://forages.nmsu.edu/resources.html and https://pubs.nmsu.edu/_a/index.html

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