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The Northern Alfalfa Seed Picture: Production

C. H. Benrud

D. C. Dahl

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*the northern
alfalfa seed picture*



production

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FOREWORD

South Dakota has long been one of the leading states in the production of alfalfa seed.

South Dakota alfalfa seed, along with that grown in neighboring states, has commanded premium prices in eastern markets because of its winter-hardy characteristics. This "Northern" alfalfa seed, predominantly a non-certified seed, has recently come into competition with certified alfalfa seed grown in such western states as California and Washington. This competition has resulted in a continuing decline in the demand for Northern alfalfa seed in the eastern markets. Accordingly, lower prices have been received by the South Dakota grower for his seed crop.

This marketing problem has prompted research investigations in alfalfa seed production and marketing by the South Dakota Agricultural Experiment Station. This research has dealt with (1) production methods in South Dakota and other areas, (2) marketing methods and problems, and (3) the economics of alfalfa seed production in South Dakota. Each of these phases is treated in bulletin form under the following headings:

The Northern Alfalfa Seed Picture

Part I: Production

The Northern Alfalfa Seed Picture

Part II: Marketing

The Northern Alfalfa Seed Picture

Part III: South Dakota Costs of Production

CONCLUSIONS

The production of certified alfalfa seed in the United States is still on the increase. While California, with over 50% of the nation's total production may have reached its peak, other western areas, including Washington, Oregon, Idaho, Utah, and Nevada, are anticipating greater acreages of the improved varieties in the future.

Commercial varieties, only recently introduced, are also increasing in importance. With full-time research scientists being employed by western seed companies, more and more of these privately developed varieties can be expected. Like commercial hybrid corn, they are highly advertised and will probably take over a sizeable share of the market.

Because of the increasing competition, uncertified or "Northern" seed, the type constituting most of South Dakota's production, can only become harder to sell. As a result, its price can be expected to fall as compared to that of certified seed.

Some certified seed is currently being produced in South Dakota and other Northern Great Plains states. Row production is being tried, with yields in some cases as high as twice those of solid stands. In other cases, registered seed is

used for regular solid hay plantings, and the stand is handled in the usual manner—hay first and then seed. More growers may find it desirable to switch to certified seed production in order to obtain higher prices and greater profits.

There are difficulties involved, however. Fields of certified seed must be at least 30 rods from other alfalfa. Sweet clover and other weeds must be kept down, and other requirements must be met. The seed used is also more expensive, and all of the additional costs must be considered along with the relative prices.

South Dakota seed yields are low in comparison with those of California and other western states. In addition to row production, such improved practices as irrigation, the use of bees as pollinators, insect control, and chemical defoliation can help to increase yields.

Increases in certified alfalfa seed production in South Dakota are being predicted by current producers, a number of county agents, and the South Dakota Crop Improvement Association. New varieties, such as Teton, developed in South Dakota and not being sent out of the area for increase, will provide opportunities for production which is not in direct competition with seed from the west.

The Northern Alfalfa Seed Picture

PRODUCTION

CHARLES H. BENRUD and DALE C. DAHL¹

INTRODUCTION

Situation

Alfalfa seed has become a farm crop of increasing importance. Total hay acreage in the United States has remained practically unchanged during the past two decades, but alfalfa hay, during this period, has increased by over 100%. Accompanying this increased acreage in alfalfa hay, total alfalfa seed production for the United States has nearly tripled.² In turn, the incomes of farmers from alfalfa seed production have multiplied approximately three times during the past 20 years.

Alfalfa seed is not a homogeneous product. For many years it has been agronomically grouped into "hardy" and "non-hardy" alfalfa seed. The term "hardy" denotes a type of alfalfa that can withstand the cold winter weather predominant in the northern part of the United States. Hardiness is the principal factor which has distinguished two separate production and marketing areas. The hardy alfalfa seed has been grown and consumed primarily in the northern states while non-hardy alfalfa seed has been produced and marketed almost exclusively in the southern part of the United States.

In recent years, another element of heterogeneity has become evident in alfalfa seed marketing and production. Alfalfa seed has been grouped into "certified" and "non-certified" categories. Certified alfalfa seed means that the seed production has been regulated and inspected by a state certifying agency. Upon passing rigid inspections, the seed is "certified" to represent a variety of known performance characteristics in addition to having fulfilled field and laboratory requirements. Purity requirements for certified alfalfa seed, including freedom from noxious weed seeds, are generally higher than for non-certified seed.

Government farm service groups, such as the United States Department of Agriculture, state experiment stations, and county agricultural extension agents, have been recommending that the farmer plant only true, adapted varieties of alfalfa seed for assurance of supe-

¹Associate Economist and Research Assistant, respectively, South Dakota Agricultural Experiment Station.

²Utilization of the greater production of alfalfa seed, in relation to hay acreage, apparently has been made possible by a gradual change in farming operations from long-term to short-term rotation programs.

rior quality and yield. These groups have especially recommended certified alfalfa seed for all farmers and either hardy or non-hardy seed depending on the farmers' location. As a result, the use of certified, adapted alfalfa seed by the American farmer is becoming more widespread.

Alfalfa seed production has increased markedly in the past several years. This increased production has been due mainly to the emergence of California as an alfalfa-producing state. California production has climbed rapidly during the past 10 years. Row planting and advanced techniques in spraying, irrigating, and harvesting have given rise to relatively large yields, which have, in turn, led to new advertising and merchandising methods that were virtually unheard of in the alfalfa seed industry before 1950. In 1957 California produced 53.1% of all the alfalfa seed grown in the United States.

Most important economically, perhaps, is the fact that California has produced a certified alfalfa seed and has been able, through vertical integration, to maintain a continuous supply for its ever-growing market.

In direct contrast to this, South Dakota and its sister states of North Dakota, Montana, and Wyoming have produced a non-certified alfalfa seed which is generally known as "Northern alfalfa seed." Although this four-state area has for many years been considered a primary production area for hardy alfalfa seed, the supply has been unstable. The seed produced in this

area is often the result of an afterthought on the part of the farmer or rancher. Once his hay needs have been realized, he may harvest a second crop of alfalfa in the form of seed, weather permitting.

This combination of factors has led, gradually but steadily, to a decrease in the market for Northern alfalfa seed. The Northern alfalfa seed, being non-certified, has had to compete with certified seed recommended by agricultural advisors and scientists. A fluctuating supply has had to compete with a more stable supply. A relatively small and unorganized advertising campaign has had to compete with a large, centralized advertising program. The Northern seed producers and dealers have recognized the major problem and are attempting to find means to combat the loss of their market objectives.

Before the Northern alfalfa seed growers and dealers can undertake a program for improving their competitive position, it is necessary that answers to at least three major economic questions be available:

1. What relationships exist between the Northern area and other production areas in regard to quantity, type, and methods of seed production?
2. What marketing problem exists and how extensive is it? What solutions are possible and most feasible?
3. What is the economic feasibility of any corrective action with regard to various alternatives?

Procedures

Using these major economic questions as base, the research was divided into three separate phases. The purpose of the first phase was to examine the main alfalfa-producing areas in the United States, with regard to volume of production, type of seed produced, and production methods, and to attempt to determine what part each area might play in future production. To meet these objectives, it was found desirable to:

1. Determine the principal areas of concentration of alfalfa seed production and the acreage and production in each. This was done on the basis of the 1954 U. S. Census of Agriculture, which also provided data on irrigation.
2. Secure information for these areas concerning more recent production, production methods, and type of seed produced. This was done through questionnaires sent to county agents in the leading seed-producing counties, based on the 1954 census, and through letters of inquiry sent to state crop improvement associations.
3. Secure additional information on production of certified seed in South Dakota. This information was secured through a questionnaire sent to the 40 farmers who produced certified alfalfa seed in 1958. Replies were received from 22 of these producers.
4. Secure additional information from California, the leading state in seed production. This involved a survey of seed accumulators in the area.
5. Obtain opinions of persons in

each area as to future trends in the area. This was done through the same questionnaires, letters, and survey.

The object of the second phase was to determine the present competitive status of the Northern producers and dealers and analyze alternative plans for improving their status.

The third phase involves determining the economic feasibility of Northern seed growers changing from non-certified seed production to certified.

This bulletin is a report of the first phase of the study.

PRODUCTION

Introduction

Alfalfa seed production in South Dakota has to a large extent been centered in the western and north central livestock producing areas of the state where alfalfa serves to fulfill hay requirements for feed. It has been a practice for many years to grow alfalfa primarily for hay and secondarily for seed. Because of this practice and also due to weather changes, alfalfa seed production in South Dakota has fluctuated year by year. In years of heavy moisture, hay supplies have been long and seed supplies have been short. The opposite has been true in drier years.

Through natural selection, the seed in this area has become renowned for its quality of winter hardiness. The severe winter weather experienced in South Dakota has provided an adequate testing ground for seed hardiness. This origin adaptation has been of

considerable economic importance in the marketing of seed from this area.

In recent years, agronomists have concluded that hardiness is essentially a varietal characteristic. Alfalfa seed that is grown and tested for its hardiness in South Dakota can be increased for one generation in southern states without losing this very valuable property. This has been one of the basic reasons why alfalfa seed production has shifted to southwestern areas of the United States.

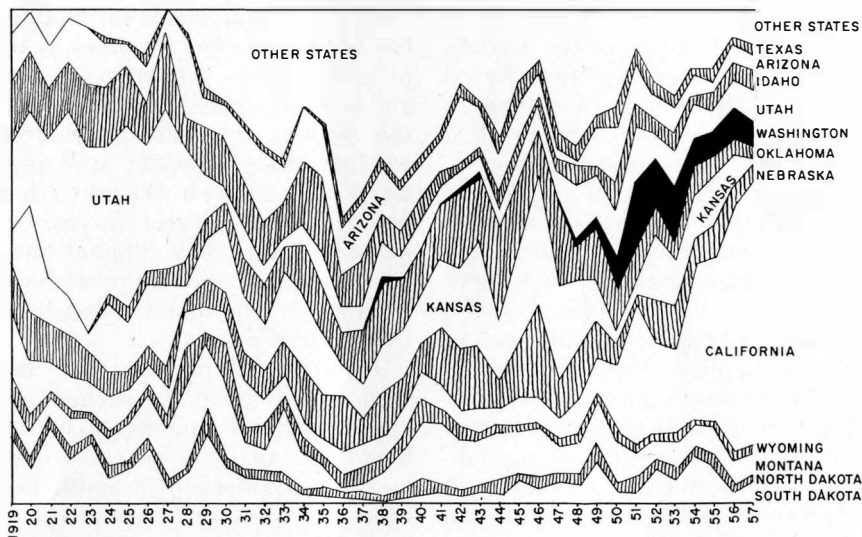
History

Production of alfalfa seed in the United States has undergone at least four distinct area changes. In 1919 Utah and South Dakota were the leading alfalfa production areas. Utah outproduced any other state

until 1930 (figure 1). During the drought years of the 1930's, alfalfa seed production shifted to the eastern states (described merely as "other states" in the figure). In 1940, after the drought period, alfalfa seed production was characteristically high in the central area of the United States. Beginning in 1949, the state of California made tremendous strides in its rate of production. Since that time, California has come to be the major alfalfa seed production area of the United States, in 1957 producing 53.1% of the total alfalfa seed harvested.

Over the years, the four-state area of South Dakota, North Dakota, Montana, and Wyoming has produced a hardy, non-certified seed that in

Figure 1. Proportionate distribution of alfalfa seed production by state, 1919-57.



Source: "Seed Crops by States, 1919-54," Statistical Bulletin No. 206, April 1957; and "Seed Crops," annual summaries for 1955, 1956, and 1957, AMS, USDA.

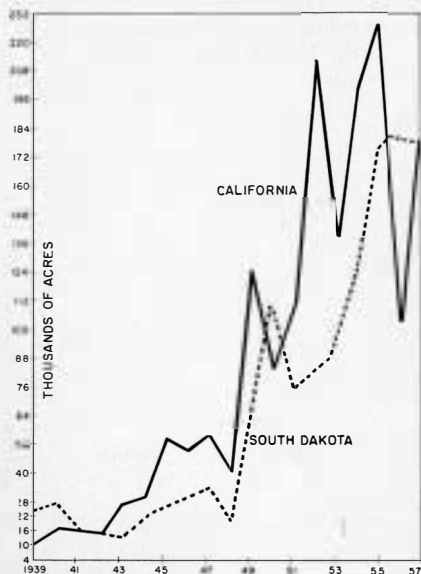
recent years has met increased competition primarily from the high California production.

Comparisons between California and South Dakota acreages for alfalfa seed shows that both states have increased their acreage in similar proportions, the actual acreage in both states being nearly the same in 1957 (figure 2).

The difference in total seed production is explained by differences in yield per acre. In 1957, South Dakota yield was approximately one-fifth of the national average and only one-twelfth of the yield per acre in California (figure 3).

Prices paid to farmers for alfalfa seed have changed between California and South Dakota, too. South Dakota producers received a higher

Figure 2. Comparison of alfalfa seed acreage harvested in South Dakota and California, 1939-57.



Source: See footnote in figure 1.

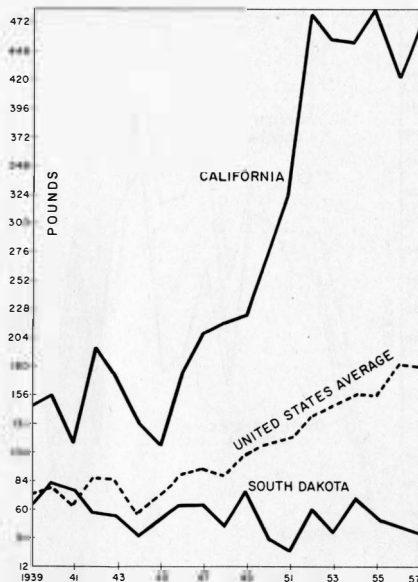


Figure 3. Comparison of alfalfa seed yield per acre in California, South Dakota, and United States average, 1939-57.

Source: See footnote in figure 1.

price for their alfalfa seed than California producers until about 1952, when California producers began receiving a higher price. This price change is attributable, to a large extent, to the change in the type of seed produced in California (figure 4).

Certified Seed

California began producing large quantities of certified alfalfa seed in 1949, mostly of the Ranger variety. Due to the increased production of alfalfa seed by California growers, certified seed increased as a proportion of the total United States crop. In 1957, over 45% of the alfalfa seed produced was certified, most of this coming from California (figure 5). Many experiment station recom-

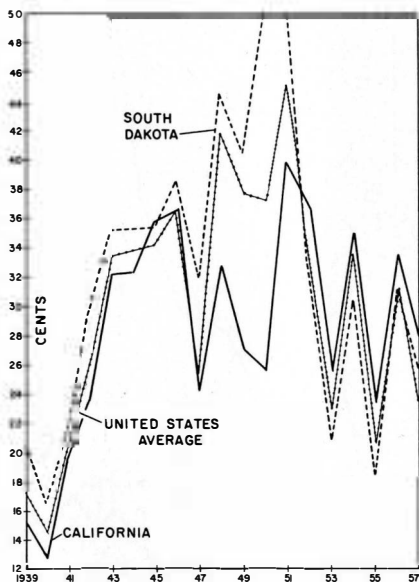


Figure 4. Comparison of price paid to farmer for alfalfa seed in California, South Dakota, and United States average, 1939-57.

Source: See footnote in figure 1.

mendations included certified Ranger alfalfa seed as an all-purpose seed for the farmer to plant. These recommendations had considerable influence on the demand for certified seed.

Hay

As the major end-product of alfalfa seed, alfalfa hay plantings have increased by over 100% during the past 14 years, while the total hay crop has remained relatively unchanged (figure 6). This increase in alfalfa usage has been primarily at the expense of clovers for hay. Hay acreages by states in 1953 are presented in figure 7. These acreages indicate the alfalfa seed consumption areas.

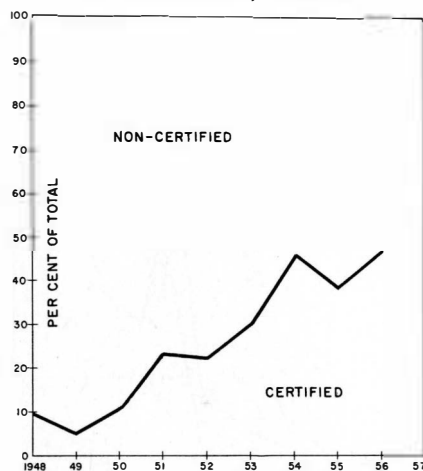
Hay-Seed Comparisons

Total hay acreage has doubled during the past 14 years, while seed production has multiplied three-fold. There are at least three possible reasons that could account for the increased usage of seed in relation to hay acreage: (1) more seed is sown per acre than before, (2) more seed is being exported than before, or (3) farming practices with alfalfa are changing from long- to short-term rotation systems.

Newer production methods do not dictate the use of more seed per acre than in years past. Quality of seed, rather than quantity used, appears to be stressed more today by production specialists.

Although alfalfa seed exports have been increasing, the amount of seed exported (including a reduction in imports) has not accounted

Figure 5. Comparison of certified and non-certified alfalfa seed production in the United States, 1948-56.



Source: "Report of Seed Certified by . . . State Certifying Agencies," for years 1948-56, Extension Service, USDA.

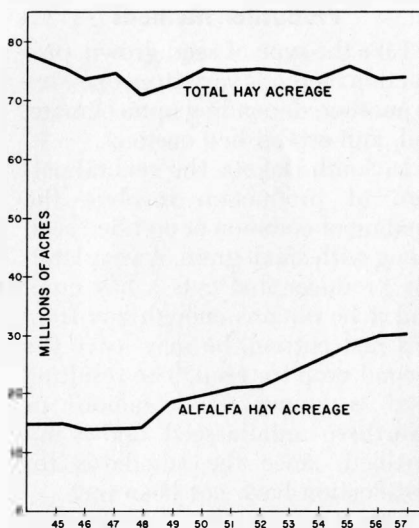


Figure 6. Total United States hay acreage and total United States alfalfa hay acreage, 1944-57.

Source: USDA releases: "Crop Production—Revised Estimates, 1944-49," Statistical Bulletin No. 108, March 1952; "Field Crops by States, 1949-54," Statistical Bulletin No. 185, June 1956; "Crop Production—1956 Annual Summary," December 17, 1956; "Crop Production—1957 Annual Summary," December 17, 1957.

for the use of the increased production of seed. Unofficial reports substantiate the remaining conclusion that shorter rotation programs are being used for alfalfa plantings now than years ago.³

Present Production

Present-day alfalfa seed production in the United States is carried on largely in the western states, beginning with the tier of states from the Dakotas south through Texas. In 1957, the production in these states was 99.1% of the total U. S. production of 160,815,000 pounds. The production by states for the

years 1949 through 1958 is shown in table 1.

Within these states, however, certain rather concentrated areas produce over 90% of the seed. In 1954 in this region 224 counties produced over 100,000 pounds each. Together, they produced 92.1% of the nation's total. These counties, together with two in Minnesota, each of which also exceeded 100,000 pounds in 1954, are shown on the map in figure 8.

When plotted on the map, these counties can roughly be grouped into eight major and three minor areas of concentration, as listed in table 2.

It can be seen from the table that not only does the California-Arizona area exceed all others in total production, but its production per acre is also considerably higher than that of the other regions. This is due to several factors, including adequate irrigation, constant sunshine and hot weather during the growing season, the use of large number of honeybees as pollinators, and systematic control of harmful insects. In general, the seed in the leading counties in this area is produced under controlled conditions.

This area is composed of two somewhat different sub-areas. The northern region includes the central valley of California and adjoining counties; in the southern are California's Imperial Valley and four other counties stretching almost across southern California and Ari-

³A large seed firm, for commercial purposes, has surveyed North Central land-use practices to find short rotation systems gaining in popularity.

zona. In the northern sub-area, row production of certified hardy alfalfa seed predominates; in the southern, solid stands of uncertified non-hardy seed are most common.

Figures for production of certified seed for all counties are not available, but the state total acreages for 1958, by varieties, together with total acreages of seed, were as shown in table 3. California led in both acreage and percentage of certified seed, with 126,654 acres representing 78.2% of its total alfalfa seed acreage. At the other end of the scale, North Dakota had only 68 acres of certified seed, equal to 0.2% of its total acreage. South Dakota, with 2,757 acres, or 1.8%, ranked ninth in certified acreage and thirteenth in percentage of the total (table 2).

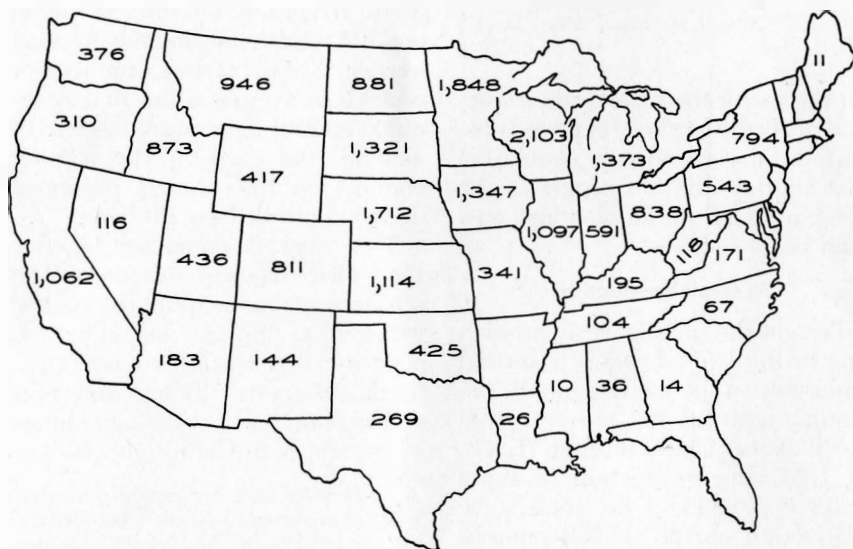
Production Methods

Like the type of seed grown, production methods vary from one area to another, depending upon climate, soil, and established customs.

In South Dakota, the general pattern of production involves the seeding of common or certified seed along with small grain. A year later, the producer first cuts a hay crop, and if he obtains enough hay from this first cutting, he may leave the second crop for seed. The resulting seed is known as "common" or "Northern" alfalfa seed, and is uncertified, since the standards for certification have not been met.

The same pattern of production was found to be fairly common in most of the areas studied. Noticeable exceptions were the leading areas of production of certified seed of hardy varieties. Five counties in

Figure 7. Alfalfa hay acreage harvested in 1953, by state (000).



Source: "Hay by States, 1952-1953," Statistical Bulletin No. 229, June 1958, AMS, USDA.

Table 1. Alfalfa Seed Acreage, Yield, and Production by States, 1958*

State	Acreage harvested		Yield per acre, lbs.					Production of clean seed, thousand lbs.	
	Average 1947-56	1957	Indicated 1958	Average 1947-56	Indicated 1957	Indicated 1958	Average 1947-56	1957	Indicated 1958
Ohio	7,410	2,800	1,400	47	50	40	348	140	56
Mich. ...	31,700	7,000	12,000	45	50	55	1,417	350	660
Wis.	17,500	9,000	9,000	64	50	53	1,221	450	477
Minn. ...	37,500	12,000	9,000	51	45	47	1,928	540	423
N. D.	62,400	50,000	30,000	45	36	45	2,876	1,800	1,350
S. D.	131,500	195,000	152,000	53	40	50	7,293	7,800	7,600
Nebr. ...	104,000	60,000	65,000	80	65	70	8,778	3,900	4,550
Kans. ...	134,200	30,000	42,000	89	80	100	12,970	2,400	4,200
Okla. ...	89,900	37,000	70,000	102	125	155	9,422	4,625	10,850
Texas ...	23,700	21,000	26,000	128	145	170	3,048	3,045	4,420
Mont. ...	79,600	71,000	51,000	88	100	90	6,953	7,100	4,590
Idaho ...	30,000	38,000	41,000	143	210	200	4,398	7,980	8,200
Wyo. ...	21,300	25,000	23,000	101	120	90	2,196	3,000	2,070
Colo. ...	24,500	14,000	20,000	123	145	150	2,954	2,030	3,000
N. Mex. ...	7,070	7,000	7,500	248	240	310	1,678	1,680	2,325
Ariz.	40,000	21,000	20,000	210	220	230	8,337	4,620	4,600
Utah	53,800	58,000	57,000	182	185	190	9,875	10,730	10,830
Wash. ...	17,900	26,000	24,000	440	420	410	9,040	10,920	9,840
Ore.	6,440	9,000	10,000	252	345	365	1,714	3,105	3,650
Calif. ...	100,100	188,000	162,000	348	450	390	38,716	84,600	63,180
U. S. ...	1,027,530	880,800	831,900	130	183	177	135,415	160,815	146,871

*Source: "Montana Alfalfa Seed Forecast," Montana Crop and Livestock Reporting Service, Helena, Montana, October 9, 1958.

Table 2. Areas of Concentration of Alfalfa Seed Production in the United States, 1954*

Area	1954 Acreage	1954 Production	Lbs./acre
1. California-Arizona	131,508	61,298,399	466
2. Central Great Plains	244,505	29,299,751	120
3. Northern Great Plains	327,115	28,762,821	88
4. Utah-West Colorado	52,300	11,675,990	224
5. Southern Washington	20,763	9,184,069	442
6. East Oregon-Idaho	23,929	4,385,725	183
7. New Mexico-West Texas	7,246	2,102,894	290
8. Central Wyoming	7,222	942,068	130
9. Oregon-California	1,819	267,978	147
10. Northern Minnesota	911	129,240	142
11. Northwest Nevada	605	101,000	167

*Source: 1954 U. S. Census of Agriculture.

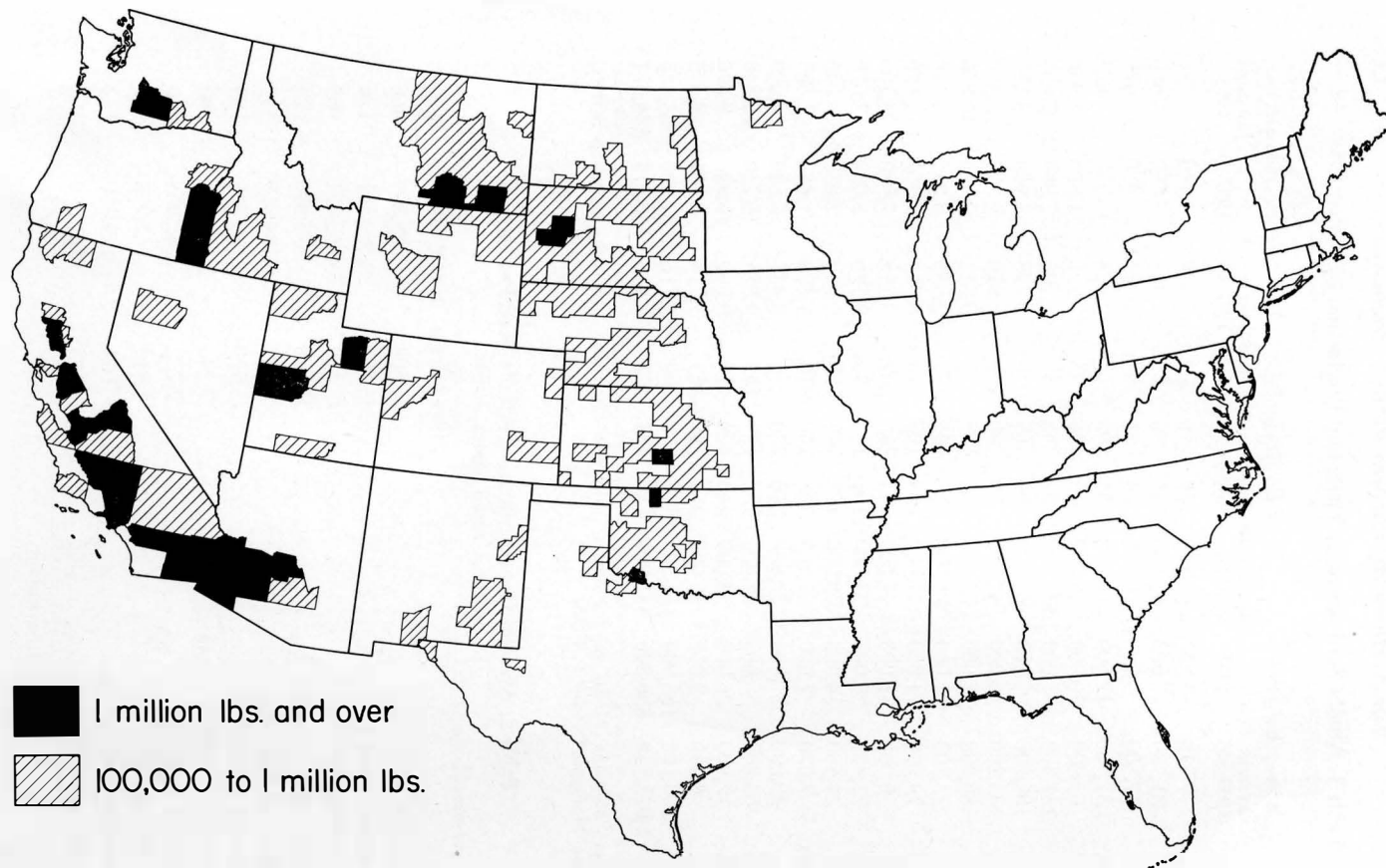


Figure 8. Counties in the United States producing more than 100,000 pounds of alfalfa seed in 1954.

Source: U. S. Census of Agriculture, 1954.

Table 3. Acreage of Certified Alfalfa Seed in the United States, by Leading States* and Varieties, 1958†

Variety	Calif.	Wash.	Ore.	Idaho	Utah	Nev.	N.Mex.	Colo.	Wyo.	Mont.	N.D.	S.D.	Nebr.	Kans.	Okla.	Tex.
Ranger	52,860	5,903	1,908	7,603	4,534	.....	.....	845	3,781	1,863	.....	1,480	1,134	.....	.....	.....
Vernal	27,219	2,655	1,525	1,882	834	147	.....	69	2,029	315	68	713	.....	.....	.....	.....
Narragansett	5,299	.....	376	487	235	.....	.....	.....	248	.....	.....	30	.....	.....	.....	.....
Cossack .....	.....	9	.....	219	.....	.....	.....	.....	62	905	.....	165	.....	.....	.....	.....
Ladak .....	.....	48	469	1,954	.....	.....	.....	195	1,690	4,452	.....	152	.....	.....	.....	.....
Grimm .....	.....	4	128	2,201	84	.....	.....	.....	540	4,875	.....	200	.....	.....	.....	.....
Buffalo	7,005	.....	.....	207	902	.....	1,494	50	1,608	.....	.....	.....	.....	1,087	4,812	289
Atlantic	5,910	.....	.....	190	47	.....	.....	.....	1,066	.....	.....	.....	.....	.....	.....	.....
Williamsburg	1,026	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	66	.....	.....
DuPuits	7,273	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Lahontan	12,371	12	117	57	189	.....	37	.....	.....	.....	.....	.....	.....	.....	.....	64
Caliverde	1,321	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
15 Nomad .....	.....	.....	225	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Orestan .....	.....	.....	118	229	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Talent .....	.....	.....	661	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. Mexico Common .....	.....	.....	.....	.....	.....	.....	293	.....	.....	.....	.....	.....	.....	.....	.....	.....
Zia .....	.....	.....	.....	.....	.....	.....	141	.....	.....	.....	.....	.....	.....	.....	.....	.....
N. Mexico 11-1 .....	.....	.....	.....	.....	.....	.....	251	.....	.....	.....	.....	.....	.....	.....	.....	20
Moapa	5,073	.....	.....	.....	.....	90	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
African	1,102	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Barstow Common .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	65
Rambler	175	.....	.....	.....	.....	.....	.....	.....	6	.....	.....	.....	.....	.....	.....	.....
Rhizoma .....	.....	.....	.....	.....	.....	.....	.....	.....	40	.....	.....	17	.....	.....	.....	.....
California Common	20	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Total	126,654	8,656	5,527	15,099	6,636	426	2,179	1,196	11,070	12,455	68	2,757	1,134	1,153	4,812	438
% of total Seed Acreage	78.2	36.1	55.3	36.8	11.6	‡	29.1	6.0	48.1	24.4	0.2	1.8	1.7	2.7	6.9	1.7

*No figures available for Arizona.

†Source: State Crop Improvement Association reports.

‡Total seed acreage not available for Nevada.

central California reported over 95% wide-row production of certified seed. Instead of being cut for hay, the stand is usually clipped early and the clippings disked into the soil. Fremont County, Wyoming, where several thousand acres of land were only recently opened to homesteading, has also developed a seed industry based upon almost 100% certified production in rows. A few counties in Utah and Idaho reported from 20% to 80% row production.

In South Dakota, row production was reported in 7 out of 18 counties, but only in two cases did row production represent over 6% of the total. It is confined to foundation, registered, and certified seed production. Nineteen out of 22 certified producers relying to the questionnaire reported row production in 1958. Planting rates were from $\frac{1}{2}$ to $1\frac{1}{2}$ pounds of seed per acre, as compared with from 5 to 10 in most cases for solid stands. Seed yields were reported to be as much as doubled as a result of row production. Twelve producers reported the use of a small grain or flax nurse crop, three used cane or corn, and four used no nurse crop. Eight of the 19 reported that they cut hay from their row plantings before taking seed. Six stated that they clipped the stand about June 1, but two added that they felt that it was a mistake. Two disked their fields to cut down the stand; four reported no cutting or disking.

Irrigation was used only to a very small extent in nine western South Dakota counties and not at all in the rest of the state for alfalfa seed pro-

duction. All of the producers in the leading counties in California and Arizona, and varying percentages in the other western states use irrigation. Some irrigation is used in every one of the counties west of the Dakotas, Nebraska, Kansas, and Oklahoma, and in two-thirds of these counties, over 50% of the acreage was irrigated in 1954 (see figure 9).

Alfalfa is a cross-pollinated crop, making use of insects as pollinators. In South Dakota, this function is left largely up to wild bees, with varying results. In Washington and eastern Oregon, there are large concentrations of alkali bees, which have proven to be much more efficient than other types. Attempts to move them out of their own regions have not thus far been successful.

In California, it is standard procedure to use tame honeybees on all fields of alfalfa for seed. A rate of from two to three colonies per acre is most common, with charges from \$4 to \$5 per colony made by the beekeepers. In central Wyoming, the rate is one colony per acre, with no charge. In some counties in the other areas, the tame bees are used to a limited extent, in most cases with no charge.

Of the 18 counties reporting in South Dakota, some bees are used in 13, with no charge indicated. Only three of the 22 certified growers reporting stated that they used them on their farms, however. It is common complaint that the bees prefer other crops, (sweet clover, for example) to alfalfa, and thus ignore the alfalfa. In California, this preference is less notice-

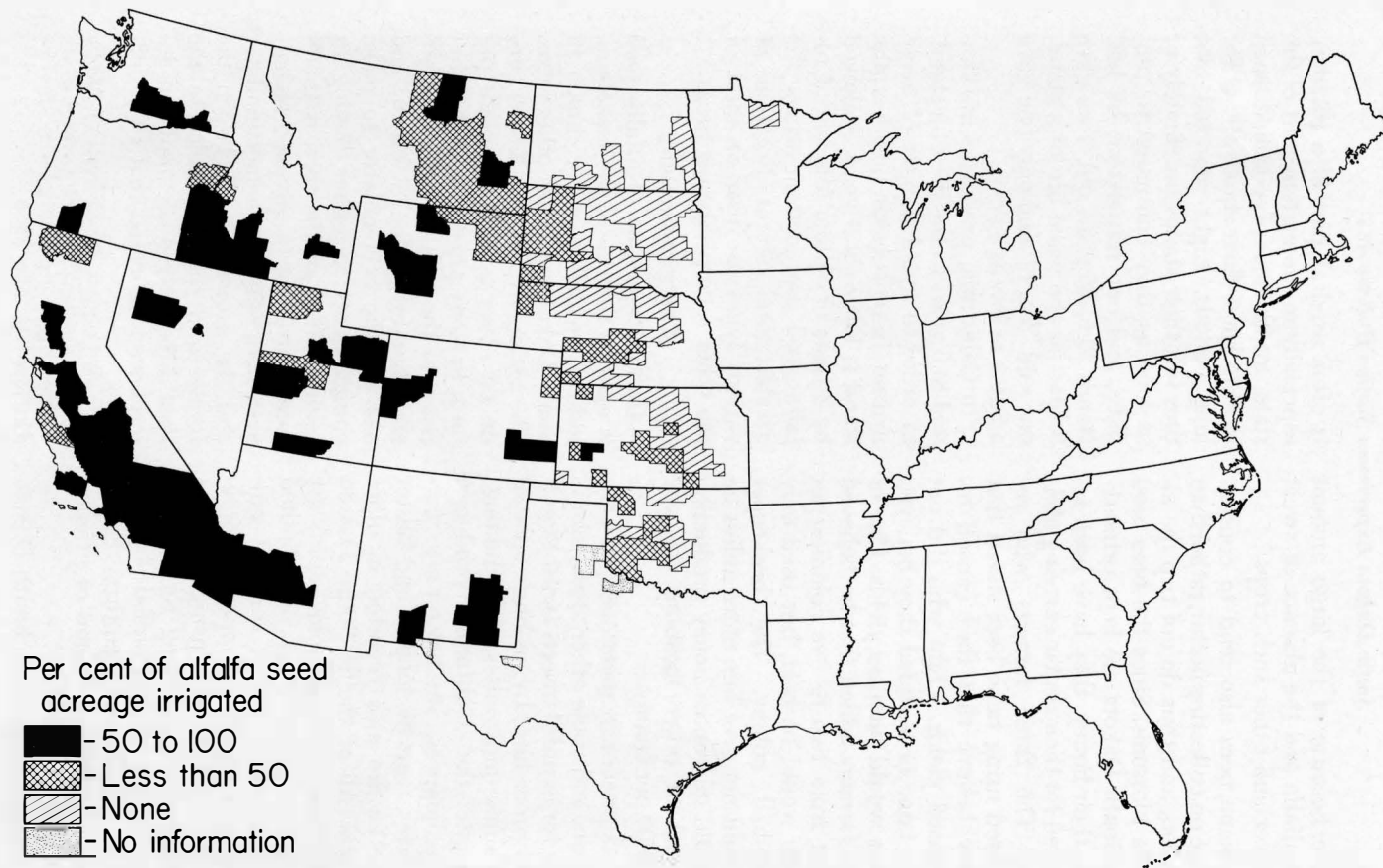


Figure 9. Percent of alfalfa seed acreage irrigated in counties producing more than 100,000 pounds of seed in 1954.

Source: U. S. Census of Agriculture, 1954.

able because of the large amount of alfalfa and the absence of sweet clover and other such crops.

Some bees also tend to concentrate on collecting nectar, rather than pollen, and thus do not trip the alfalfa blossoms. Since the bees used in South Dakota are kept primarily for their honey, they have been selected for their nectar-carrying ability. The three farmers who reported using tame bees stated that they believe that they caused increased yields. Eight who did not use tame bees stated they believed bees would increase yields. One of the farmers added that he believed that from two to five colonies per acre would be best, but used only one-half colony. The beekeeper would not give him more unless he would guarantee honey production equal to other locations, or pay \$15.00 per colony.

As previously mentioned, in California and some other areas, spraying for harmful insects is also standard procedure. Lygus bugs, spotted alfalfa aphids, mites, and stinkbugs plague the California producer; grasshoppers, webworms, cutworms, weevils, loopers and blister beetles are also reported in other states. All of the 18 South Dakota counties reported some spraying, but in several cases only limited amounts. Of the 22 certified producers contacted, 9 reported spraying, at least four using airplane applications. Spraying for harmful insects is recommended by the South Dakota Agricultural Extension Service as a means of promoting high seed yields.⁴

Whereas alfalfa in South Dakota

is often used as part of a rotation, especially in the eastern part of the state, producers of certified seed tend to leave their stands intact for long periods. Eight reported that they left their stands indefinitely or as long as they continued to produce, and one stated that he had stands 20 to 25 years old. Two gave 8 years as the usual life of a stand, one said "5 or 6," and only one gave a figure as low as 3 years.

In California, producers are limited to 6 years as the life of a stand, in order to avoid danger of acclimation. In most cases, however, the stand is left only 3 years, followed by 3 years of cotton. Alternating alfalfa seed and cotton brings the greatest total returns. Rotations of various types are used in most of the other seed producing areas.

Contract-Growing

Contract-growing of alfalfa seed is another feature of the California industry which is not common in South Dakota and most other areas. The extremely large quantities produced (over a million pounds per farm in some areas) make it rather risky for the producer to wait until after harvest to find a buyer, and also for the accumulator to make commitments in either buying or selling. Much of the seed is therefore contracted in advance of harvest, both between the accumulator and the grower and between the former and the wholesaler in the East. Most of the accumulators interviewed indicated that they defi-

⁴John A. Lofgren, *Insect Pests of Alfalfa Seed Production and Their Control*, South Dakota Agricultural Extension Service Circular 533, May 1956.

nately attempted to avoid taking either a "long" or "short" position in the market. With no futures market available for hedging, contracts have come into use to help avoid unnecessary risk.

Some contracts are entered into for the life of the stand. This is true especially for new varieties and those under the control of the contracting firm. The latter includes two certified varieties and the new "private" varieties, which have been developed by the companies. More common, however, is the "refusal" contract, whereby an accumulator contracts to purchase all or a part of a grower's crop, provided no other firm offers a higher price at the time of sale. Should such a price be offered, the accumulator may "refuse" to buy, but the grower has a market for his crop anyway. Contracts of this type usually call for the sale to be made at market price, although there are some firm contracts, and others involve maximum and/or minimum prices. Some contracts cover the entire crop; others involve a definite number of pounds per acre.

The chief advantage of the contract to the grower is that he is assured of a market for his seed. In case of a bumper crop and insufficient demand, contracts are taken care of first, and only afterward is other seed purchased. With the high cash costs involved in production usually exceeding \$100 per acre, a farmer without a market could find himself in financial difficulty. At the same time, the accumulator minimizes his risks, and the movement of seed is facilitated.

In addition to arrangements for the sale of the seed, a contract may also involve such items as furnishing the registered seed for the planting, advising when to spray, and arranging for credit. Three co-operatives and one other corporation operate on a "pool" basis, whereby a producer agrees to sell all of his seed through the company, and all returns from each variety of seed are pooled and prorated to the producers of that variety.

Only in areas of highly concentrated production in Washington, Oregon, Idaho, and central Wyoming, were there reports of any high degree of contract growing or selling outside of California. Mentioned as the most common type of contract in the Pacific Northwest was the "refusal" contract, with a pool operation being used in Wyoming. Three counties in South Dakota, one in North Dakota, one in Kansas, and one in New Mexico indicated small amounts of contracting. Because of the smaller amounts produced and the by-product nature of the crop, however, there has been very little development along this line in these areas. In South Dakota, it has been largely limited to foundation seed production.

South Dakota certified seed growers were asked what they considered the biggest problems in certified production. Weeds were named by 7 of 22 producers, followed by insects, cited by 6. Three mentioned sweet clover, while isolation, pollination, and finding a market were each mentioned twice. Finally, one vote each went to

"cleaning combine," "having to have seed tagged," "lack of advertising," "getting seed clean," "trash," "extra time required," "row stand goes down," "getting a crop," and "getting farmers to grow it."

Future Production

What can be expected of the various areas as far as future production is concerned? While there can be no definite answer to this question, an attempt has been made to secure qualified opinions as to future developments.

California-Arizona. Central California, the northern half of the California-Arizona production area and the nation's leading source of certified seed, will no doubt continue as the leading source of certified seed of hardy alfalfa varieties. It is believed, however, that most of the increase has already occurred. Fresno and Kings counties in the San Joaquin Valley, where the greatest recent increases have taken place, report that still further increases are expected. No increases are expected in two counties unless the price rises. In five, decreases are anticipated.

Three county farm advisors gave low prices as the leading reason for anticipating decreases. Other reasons given were "low yields and water limitations," "weedy land," "isolation is difficult," "high costs of production," and "saturated market." In spite of the fact that yields of 700 pounds and over per acre are quite common, high land values and costs for irrigation, spraying, weed control and other operations lead to total production costs of 27c or

more per pound, and some years the price falls below this figure.

There probably will be some shift from Ranger to Vernal and Narragansett, as increased demand for the latter varieties is translated into higher prices. Some price differential is almost essential because their seed yields are generally lower than that of Ranger. Some replacement of certified seed by new private varieties developed and propagated by the seed companies is also occurring. At least two companies were employing full-time research scientists in 1958 for the purpose of developing these varieties, and four other firms were beginning or contemplating similar action. The seed companies have begun this type of activity in order to have the advantage of product differentiation in promoting the sale of their seed in competition with that of others. It has been one of their common complaints that it is difficult to increase sales without cutting prices when competitors are offering the same product—certified seed of a recommended variety.

One goal of the research carried on by the seed companies, as well as that of the state experiment stations, is the development of a practical hybrid alfalfa. In the meantime, some of the private brands are labeled "with hybrid vigor," in reference to the fact that the seed involves some degree of hybridization. With extensive advertising their use may increase rapidly.

A large part of the increase in alfalfa seed production in the central valley came about as a result of government limitations on the acre-

age of cotton, the area's most profitable crop. Alfalfa seed was found to be the next most profitable alternative. It also serves to build up the soil so as to obtain greater production of cotton. Abolition of cotton acreage limitations would undoubtedly cause an increase in cotton acreage and a decrease in alfalfa seed production, but because of the complementary relationship and the fact that alfalfa can be irrigated during the off-season for cotton there would not be a complete switchover to cotton.

Southern California (mainly the Imperial Valley) and southwestern Arizona, the other half of the great southwest production area, should continue to offer practically no competition for northern-grown seed. Their production consists almost entirely of non-hardy varieties, such as African, Moapa, and Chilean 21-5, with seed harvested following two or three crops of hay. No interest has been shown in this area in getting into the production of the hardy varieties, since conditions seem best for the hay-seed combination, and the southern varieties are best adapted. Even in these varieties, no increase is expected. In fact, total production and yields per acre have been declining for several years.

Central Great Plains. County agents in the Central Great Plains states were equally divided as to the possibility of increases in total production, with 12 expecting increases, 12 expecting none, and four undecided. Most of the predictions for increases were based on the unusually small 1957 crops, especially in Oklahoma.

Three county agents in Nebraska expected increases in certified Ranger, and nine agents in the area expected some shifts from common to Buffalo. Reasons given were surplus of forage, price differentials, marketability, and aphid resistance.

Fourteen expected little or no increases in certified seed production, while one said it would depend on price. Lack of extra return, difficulty of isolation, adequate demand for common seed, non-adaptation of northern varieties, lack of interest, and the by-product nature of seed production were given as reasons.

State certification agencies in this area predict no increase in Ranger, Vernal, or other northern varieties.

Northern Great Plains. In the Northern Great Plains area, fourteen county agents, mostly in South Dakota, predicted increases in total seed production. Improved management practices, including row planting, insect control, fertilization, irrigation, and the use of honeybees as pollinizers, were given as the reasons. Four others qualified their answers, stating that increases would depend upon price and a well managed program to encourage the production of certified seed. Fourteen agents predicted no increases, giving low prices, uncertainty of crops, the secondary nature of seed production, and competition from the West as the principal reasons. Montana agents were especially pessimistic concerning future production.

Fourteen county agents also expected to see increases in certified seed on the basis of price differentials and current increased interest

in new varieties, as stimulated by crop improvement associations. The South Dakota, Wyoming, and North Dakota certification agencies agreed, although the latter predicted a slow rate of increase in its state.

Seventeen agents and the Montana certifying agency did not expect to see increases. Most commonly given as a reason was a lack of price differential, with the by-product nature of the seed crop second, followed by outside competition and the difficulty of establishing isolation.

Ten of the 22 South Dakota certified seed producers expected to see other farmers in their areas go into certified production, ten said that they did not, and two had no opinion. Ten planned to increase their own production, nine planned to continue at the same level, and only one planned to decrease. Seven expressed interest in producing new varieties, such as Teton.

It would seem, then, that there will be some increase in certified seed production in the NGP area, especially in South Dakota, with some also in North Dakota and Wyoming. Some of this should replace common seed, with some row production as a cash crop in addition, replacing other crops.

Utah-West Colorado. In this area, two of the five agents reporting expected to see increases in total acreage, while three agents and the Utah certification agency predicted more certified production. Increased demand for new and improved varieties, new clean land coming into production, and im-

proved practices were given as reasons. Low prices were given as a hindrance by those who predicted no increases. Lack of irrigation water and trouble with dodder were also named.

It would seem safe to predict some increases in total production and more in certified, including hardy varieties.

Southern Washington. In the Yakima Valley of Washington, both of the agents reporting stated that they expected increases in total production, due partly to the advantage of seed over hay and partly to the migration of alkali bees into additional counties, where they should cause increased seed yields.

In regard to certification, one said that "any increase will be slow," largely because of the isolation problem. The other county agent predicted an increase on the basis of a planned "community one-variety program."

Oregon-Idaho. In this area, one agent expected an increase in total seed production, because of the "low price of hay and the distance that hay has to be hauled." Another said, "Yes, if alkali bee numbers can be increased." Two, on the other hand, said that because of low prices they expected no increase.

Three out of four said that they expected increases in certified production, however, due to low hay prices, good price and demand for certified seed, new plantings of registered seed, and reduction of wheat allotments. The fourth expected "very little" increase, but added that "much depends on

price.” The Oregon certifying agency expected “a slow increase, particularly in Vernal;” the Idaho agency said “no increase in Ranger, some in Vernal.”

In this area, some increase in total production is expected, with the greatest proportionate increase in certified Vernal.

New Mexico-West Texas. No expansion of seed production, either total or certified hardy varieties (which are not grown there), was forecast by any of the agents in this area. It can be safely disregarded as far as competition with South Dakota seed is concerned. Reasons given were low prices and high costs, aphids, and non-adaptation. One county agent in Texas stated “the alfalfa aphid put us out of the seed business.”

Central Wyoming. No further increases were predicted for central Wyoming, because of too high expenses, low prices and yields, and the fact that practically all of the present production is already in certified seed.

Nevada. While thus far Nevada has been only a relatively minor producer, the certification agency reported that 1,100 new acres, mostly of Ranger and Vernal, were to be seeded in 1959, as compared with 50 acres of Vernal harvested in 1957

and 97 acres in 1958. There is a distinct possibility of irrigated areas in this state becoming important sources of certified seed.

Eastern States. None of the states east of those already discussed show any signs of increasing total or certified alfalfa seed production to any extent. The recent trend has been downward, and any increase in certified would be difficult because of isolation problems.

SUMMARY

In viewing the over-all picture, indications are that the total production of certified hardy seed will continue to increase. Much of this will be in Vernal, which is replacing Ranger. Other varieties, including Teton, will also make up part of the increase. Largest increases should occur in the Northern Great Plains, Utah, Oregon, Idaho, and Washington. Some further increase is expected in the San Joaquin Valley in California, but counterbalancing decreases are predicted for other areas of the state. There will be some replacement of certified seed by the new private brands, some of which are already on the market. There may be increases also in total production, so that there will continue to be a large amount of common seed on the market.