

# An Economic Study of the Hop Industry in Oregon



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## SUMMARY

**PRODUCTION.** Hops constitute one of the oldest established agricultural industries in the state of Oregon. In 1930, there were some 14,000 acres of hops harvested in this state, from which a crop valued at \$2,350,000 was realized.

In recent years, Continental Europe has been credited with half of the world's hop crop, while the United Kingdom and United States have contributed approximately one-fourth and one-fifth respectively, leaving a remainder of but 3 percent for the countries of Canada, Australia, and New Zealand. Of the hops that are produced in the United States, Oregon can now claim more than half the total. Washington and California are credited with practically all of the remainder.

World hop production, which declined very materially during the World War, has shown a rapid recovery in the past ten or twelve years, but present production is still appreciably below the high levels of 1905-1914. Prior to 1915, the United States crop of hops increased relative to the production of Great Britain and the world at large, but in more recent years the percentage has declined. Yields per acre in the major producing countries average higher than they did in 1909-1913; therefore, a smaller acreage is required to produce a given quantity of hops for the market than was formerly the case.

Over the past ten or twelve years, hop production in Oregon has trended definitely upward in comparison with a decline in California and a stationary or only slightly increasing tendency in Washington. Oregon's position as the leading state in hop production was regained in 1923, and this state has since then maintained first place. All three states showed a decline in 1930 as compared to the years just preceding.

Aside from a small acreage in Jackson and Josephine counties, the hop industry of Oregon is at present confined entirely to the Willamette Valley area. This district has, in fact, held a position of dominating importance ever since 1879. Marion and Polk counties alone have three-fourths of the state's total acreage.

**MARKETING AND CONSUMPTION.** Foreign markets have for many years provided an important outlet for Pacific Coast hops. Exports of domestic hops from the United States attained very high levels during the years 1919 to 1923, but since then there has been a continual decline. Imports for consumption, which in former years attained considerable proportions, are of minor importance at the present time, although in recent years imports have shown an increase.

Great Britain, Irish Free State, and Canada are the outstanding export markets for our hops at the present time. Exports to the United Kingdom have fallen off because of large surpluses, high import duties, and a decreased consumption of hops in that country. Canada, on the other hand, has been buying increasing quantities of European hops at the expense of the American product. Our exports to the Continent of Europe, which attained large proportions several years ago, are no longer of significance, owing to greatly increased production abroad.

The quantity of hops retained and received for consumption in the United States in the five-year period 1925-1929 was approximately 10 million pounds larger than in 1920-1924, indicating an increase of domestic consumption during the past decade. The 1925-1929 average, however, amounted to scarcely one-half the 1910-1914 figure.

Hop consumption in the United Kingdom during the period 1925-1929 was at somewhat lower levels than in 1919-1924, and at materially lower levels than in 1905-1914. Domestic production in that country is now furnishing a larger pro-

portion of total consumption than was formerly the case. Canadian hop consumption, on the other hand, has apparently been on the increase since 1915-1918. In recent years, imports for consumption into Canada have made up nearly four-fifths of all hops retained and received for consumption.

**PRICES.** Viewed from the standpoint of actual prices paid Oregon growers, hops underwent a general upward trend over the period 1895 to 1919-20, but in the past decade the trend has moved downward. When such prices are adjusted for changes in the general price level, a downward tendency is observed ever since 1909-1913. There have been many violent fluctuations during the long-time trend, however.

A wide variation exists between prices of different growths of hops, and especially between the crops of different countries. High import duties, artificial price manipulations, and demands of individual brewers for certain growths of hops, as well as differences in the kind and quality of hops produced, are some of the reasons for these variations.

The seasonal average price of hops over a long period of years has averaged higher in the fall than at any other time of the year. There are exceptions to this general rule, however, for in 8 out of 41 years from 1890 to 1930, both the winter and spring price averaged higher than the fall price, while in 3 additional years the spring price alone was higher.

**OUTLOOK.** Since the potential acreage for hop production on the Pacific Coast is far in excess of present market demands, the acreage policy of growers should be guided primarily by a consideration of trends in competing areas and of changes in market demand for the product.

From all the facts at hand, it seems rather evident that there is little in the foreign market situation which holds promise of profitable expansion in the forthcoming years. Great Britain, which has been the largest purchaser of American hops, shows a growing tendency to become more self-supporting with regard to hops, and is likely to continue this tendency as long as the present tariff on imported hops is operative. In Canada, even though consumption has apparently increased, the greater importations of European hops together with a small increase in domestic production have brought about a curtailment of imports from the United States.

Turning to the domestic situation, it is found that even though the volume of all hops retained and received for consumption in the United States has been on the increase in recent years, the general feeling in the trade is that there will be no sudden change in the national consumption of hops in the near future.\*

All things considered and barring unforeseen circumstances, the market outlook for the hop industry does not seem to justify any appreciable increase in national hop acreage during the next few years. National hop production in 1930 was sufficiently reduced to bring about an improvement in the price situation. The fact that present prices are favorable as compared to other farm commodities should not blind growers to the need of adopting a conservative and rational program in their future programs of production. In the past, periodic over- and under-production of this and other farm crops has occurred, mainly because producers, in deciding their production programs, have been influenced primarily by prices received for the current crop, rather than by a well-reasoned plan of trying to adjust production to prospective market demands. This is especially important with a crop such as hops, the growing of which requires such a large outlay of capital.

The recent appearance of downy mildew in hop patches of the Pacific Northwest presents a new element in the hop situation, the outcome of which is still

\* Assuming that the prohibition laws of this country will not be modified to permit the legal manufacture of beer.

problematical. Should the disease prove as serious as it has in British Columbia and Europe, its control might necessitate a considerable additional cash outlay. Since rains and humid atmospheric conditions favor spread of the disease, it is possible that the drier sections of Western Oregon will be in a more advantageous position to cope with the problem than are regions of greater humidity.

The fact that hop production in Oregon has made rapid increases over the past decade, in comparison with a decline in California and a stationary or only slightly increasing tendency in Washington, suggests that this state enjoys certain competitive advantages over other Pacific Coast states despite the handicap of lower average yields obtained. It also demonstrates the favor with which the trade has accepted the Oregon product, and augurs well for the future.

The increasing importance of attaining a high standard of market quality cannot be overemphasized, especially at a time when our export markets are being confronted with such keen competition as at present. Even though Oregon hops are of high recognized standing, dealers and brewers in the trade have made frequent complaints of our hops, among which careless picking and baling, improper curing and poor spraying are the most widespread. Fortunately, the 1930 crop of Oregon hops showed improvement over the years just previous in the matter of clean picking and proper handling. It is to be hoped that this improvement will continue in the future.

# An Economic Study of the Hop Industry in Oregon

By GEORGE L. SULERUD

## INTRODUCTION

Hops have been grown commercially in Oregon for the past five decades and therefore constitute one of the oldest established agricultural industries in the state. Statistics assembled by Oregon hop dealers and growers indicate that in 1930 there were some 14,000 acres of hops harvested in Oregon from which 15,600,000 pounds of hops were obtained. When expressed in terms of December 1 farm prices, this crop had a value of \$2,344,500.00, representing 3.4 percent of the value of all crops, and 4.0 percent of the value of the major farm crops in this state.\* Even though these percentage figures are not large, the product here represented is of real importance to those areas and producers concerned. Hops, requiring as they do, such a large amount of hand labor in their production, contribute a proportionately larger cash income to the economic welfare of the community than crops of less intensive culture.

Conditions in selected localities of Oregon, Washington, and California are favorable for the production of hops from the standpoint of large yields of high quality, and there is no doubt that the total acreage suitable for the growing of this crop is greatly in excess of present market demands. Local markets consume a very small percentage of Oregon's hop production. Practically the entire crop is absorbed in Eastern markets or exported to foreign countries. Future acreage expansion or retrenchment, therefore, should be guided primarily by present and prospective market conditions.

Economic success for the hop grower in Oregon is as much contingent upon his ability to adapt himself to shifts in competing areas and to changes in market demands as it is upon individual farm efficiency. The influence of competing areas and changing demand is reflected in the price of the product. With competing areas expanding production, therefore, or with a falling-off in consumer demand, lower prices tend to follow. Conversely, declining production elsewhere or stimulation of consumption tends to enhance values.

There are few agricultural commodities that present so wide a variation in prices from year to year as hops. Prices paid growers in Oregon, for example, have ranged anywhere from a few cents to \$1.00 per pound over the past three decades. Owing to such great fluctuations of prices, hop growing from a business standpoint becomes extremely variable and, in many respects, uncertain. A commodity that can be produced and sold for several times its cost, as has been known to occur in hops, stimulates a lively speculative feeling which may be turned to keen disappointment on the part of those who rush into the enterprise without adequate preparation, experience, or finances. The crop is somewhat susceptible to injury by neglect, mismanagement, and disease, and both yield and market value may be seriously impaired by careless handling.

\* Statistics published by the office of the Federal Statistician, Portland, indicate that the combined value of 75 crops in Oregon in 1930 was \$68,554,000; and of 22 principal crops, \$59,173,000.

No satisfactory substitute has yet been discovered to take the place of hops in the brewing industry; yet no commodity is quite so limited to a single use, hence the violent fluctuations in price, and consequent loss in years of large surplus or in cases of poor quality, or whatever the cause might be.

The hop industry is just recovering from a period of overproduction and low prices. Large surpluses and ruinous prices have been the rule throughout the world, although of late the situation in the United States has shown substantial improvement. During the World War all the major producing countries in Europe abandoned or neglected hop production, the result being that a large demand for American hops arose soon after the peace treaty was signed. It did not take many years for production to make rapid gains abroad, however, with a consequent falling-off in United States exports. The heavy losses which European growers have recently sustained in accepting prices below the cost of production is accentuating the process of retrenchment in the industry abroad, thereby helping to restore once more the balance between production and consumption.

It was with the objective in view of assembling, analyzing, and interpreting, in so far as is possible, all the facts available relating to the present economic status and outlook for the hop industry in Oregon, that this study was undertaken.

While a lack of certain basic statistics has been encountered in some phases of the study, it is felt that in the main the data are sufficiently adequate to reveal trends of significance to growers. There is need for further and more intensive studies of problems connected with standards of hop valuation and of growers' production practices, such as spraying, picking, curing, and baling, as they affect market quality of the product.

## GEOGRAPHIC DISTRIBUTION

**World.** Considering commercial hop production from an international standpoint, Figure 1 shows that in the period 1925-1929, Continental Europe alone produced about half of the world's hop crop.\* The United Kingdom and the United States produced approximately one-fourth and one-fifth, respectively, leaving a remainder of but 3 percent for the countries of Canada, Australia, and New Zealand. For some years prior to 1916 the United States surpassed all other countries in the quantity of hops produced, but in more recent years England's crop has averaged somewhat larger.† The leading producing countries on the Continent of Europe include Czechoslovakia, Germany, France, Yugoslavia, Belgium, and Poland.

**National.** From Figure 2 it will be observed that during the period 1926-1930 Oregon produced more than half the national crop of hops, while California and Washington are credited with nearly all of the remainder.‡ New York, which formerly ranked first in volume (Figure 5, page 19), has very largely abandoned the production of this crop in recent years.

\*The information upon which the accompanying chart is based was taken from Table XIX (Appendix).

†See Table XIX (Appendix).

‡Information based on Table XXII (Appendix). Since no separate estimates are available for the state of New York the difference between United States and Pacific Coast production is here taken as New York's production. It is believed that the 1929-30 production for New York State would average even less than 3 percent of the national crop. See also discussion on page 17.

Hops can be grown generally throughout the United States, but as far as commercial production is concerned the industry has become concentrated into definite and limited areas along the Pacific Coast. Since the hop is a product having high unit value in relation to its bulk, the factor of favorable physical conditions of soil and climate has a greater influence in determining

**PERCENTAGE DISTRIBUTION OF COMMERCIAL HOP PRODUCTION, LEADING COUNTRIES IN THE WORLD, 1925-29 AVE.**

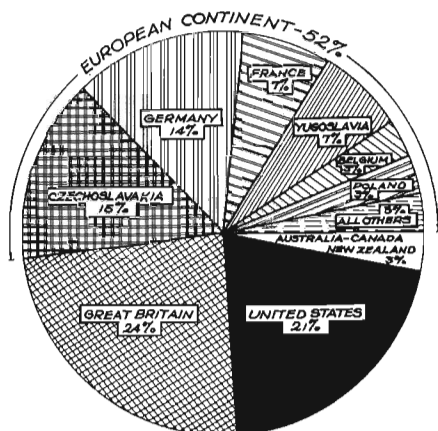


Figure 1.

**PERCENTAGE DISTRIBUTION OF COMMERCIAL HOP PRODUCTION, LEADING STATES IN THE UNITED STATES, 1926-1930 AVE.**

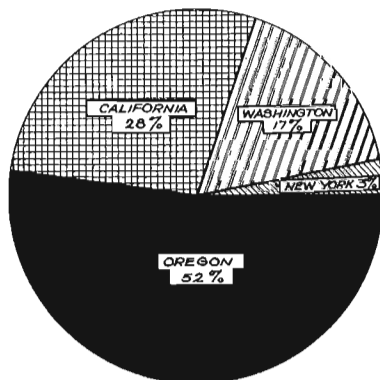


Figure 2.

the location of the industry than accessibility to market. Hops are grown most successfully in the milder regions of the country, where abundant early rainfall is followed by warm, dry weather as the crop approaches maturity. Long and severe winters frequently kill out many of the plants, and continued damp or foggy weather is usually followed by severe attacks of vermin, mold and honey dew, while in very dry seasons the red spider does considerable damage.\* In certain sections where the rainfall is scanty, such as the Yakima Valley, Washington, and the Sacramento Valley, California, irrigation frequently becomes necessary. In general, rich alluvial bottom-lands of good drainage, such as are found along rivers and streams, are preferred for hop raising.

### WORLD, NATIONAL, AND REGIONAL TRENDS IN HOP PRODUCTION

Since the export trade furnishes an important outlet for Oregon hops, cognizance must be taken of the international as well as the national and regional situation in the hop industry. Both the present status and outlook as indicated by the trends of the industry must be considered.

#### TRENDS IN WORLD PRODUCTION

Viewing the trend of world hop production over the past five decades, it is observed from Figure 3† that the general trend was upward from 1880 to 1908, this being followed by a sharp break in 1909 and an irregular recovery to 1914. The war years witnessed a great decline of hop production, the crop of 1918 being scarcely one-fourth that of 1914.‡ All the major producing countries shared in this decline, but the decrease on the European Continent was even greater than in England or America. Naturally, the warring nations had to concentrate on the production of foodstuffs at the expense of non-food crops like hops. From 1919 onward we find a rapid and substantial recovery, although the high mark of 183 million pounds attained in 1929 was still some 37 million pounds under the 1914 figure. Nevertheless, the crops of the past few years have been large enough to cause a distressing world surplus with consequent low prices,§ the effect of this being a curtailed production in 1930.

For many years the United States and Great Britain have led all other nations in the amount of hops produced. (Figure 3 and Table XIX, Appendix.) United States hop production increased as compared to that of Great Britain and the rest of the world from 1880 to 1915, as shown in Figures 3 and 4.|| Our country was credited with 19 percent of world production in the five-year period 1880-1884, while the 1910-1914 average showed that we had nearly 27 percent of the world crop. Great Britain, on the other hand produced 27 percent of the world crop in the period 1880-1884, but only 20 percent in 1910-1914.

\* See U. S. Department of Agriculture Farmers' Bulletin No. 304, "Growing and Curing Hops", pages 3 and 4.

† For sources of information see Table XIX (Appendix). Official statistics on hop production were used in all cases except the following: Germany, Czechoslovakia, Yugoslavia, Poland, and Russia for years 1918 to 1929, which were computed from annual hop reports of Joh. Barth & Sohn, Hop Merchants, Nuremberg, Bavaria. Inaccuracies of the official production estimates for certain of the European countries since 1918 are indicated in these annual reports. The aim in the present discussion has been to use those estimates which appear most reliable.

‡ Figures during war years are exclusive of Belgium and Russia; figures for years 1918 to 1924 are exclusive of Russia.

§ See section on prices, page 51.

|| The information upon which Figure 4 is based was taken from Table XX (Appendix). The 1920-1924 average is exclusive of Russia, for which no data are available.

Post-war conditions altered the situation once more, so that by 1925-1929 the United States could claim only 21 percent and Great Britain 24 percent of the world total.

A remarkable uniformity in percentage distribution of world hop production is noted by comparing the period 1880-1884 with 1925-1929. In these two five-

### HOP PRODUCTION: WORLD TOTAL, EUROPEAN CONTINENT, GREAT BRITAIN AND THE UNITED STATES, 1880-1930

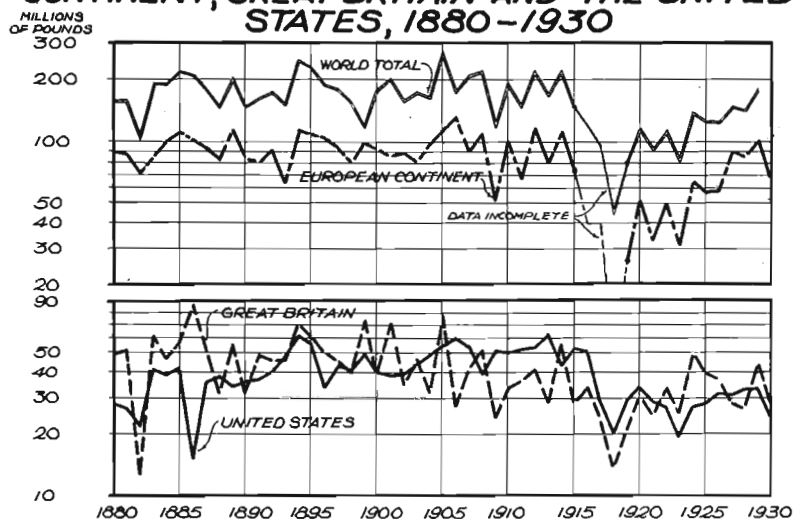


Figure 3.

### PERCENTAGE DISTRIBUTION OF WORLD'S HOP PRODUCTION, LEADING COUNTRIES OF THE WORLD, 1880-1929

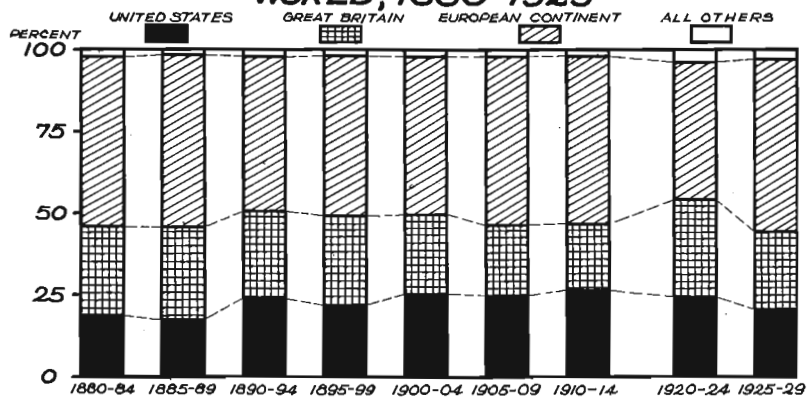


Figure 4.

year periods the countries on the European Continent are credited with a little more than half the world crop, Great Britain with one-fourth, roughly, and the United States, one-fifth. Canada, Australia, and New Zealand, involving the remainder, showed a slight increase in relative importance over the period. There have been shifts within the Continent of Europe, however, as reference to Table XIX (Appendix) will show. Production in Germany, for example, underwent a material decline from 1880-1884 to 1910-1914, while in Austria-Hungary (listed under "all others" in Table XIX) the trend was decidedly upward over the same period. In the past decade all of the major producing countries on the European Continent have increased their production of hops, but this increase has been more rapid in Czechoslovakia and Yugoslavia than elsewhere.

The foregoing production trends have, in many cases, held true for acreage changes also. Table XXI (Appendix) shows that the acreage in Continental European countries increased from 1920-1924 to 1925-1929, but that the levels are still below pre-war. Great Britain's acreage has not changed much during the past decade, while the United States figure has actually decreased. As has already been shown, the production in these two countries increased over the same period. This is to be accounted for by the fact that yields per acre have been on the increase, as will be shown in the section which follows.

#### TRENDS IN YIELDS

Hop yields per acre in leading producing countries of the world are at higher levels than they were in 1909-1913. It is observed that the world average as shown in Table I increased from 683 pounds in 1909-1913 to 939 pounds in 1925-1929, which represents an increase of more than 250 pounds per acre over the period.\* Practically all of the major producing countries have shared in this increase. Continental European countries increased from an average of 510 pounds per acre in 1909-1913 to 710 pounds in 1925-1929.† Most of the European countries have in recent years maintained higher yields than they did in 1909-1913 (See Footnote of Table I). During the same period Great Britain increased from 977 pounds to 1,405 pounds; and the United States, from 1,042 pounds to 1,351 pounds. Australia also showed a substantial increase, but Canada has apparently undergone a decrease, the 1910-1913 average being 1,556 pounds as against 1,367 pounds in the period 1925-1929. Most of the hop-producing countries of the World, therefore, require a smaller acreage to produce a given quantity of hops for the market than was the case prior to 1914.

Yields per acre are influenced by a number of factors such as variety of hops grown, soil, climate, and whether hops are seeded or seedless. For example, the low average yields obtained on the Continent of Europe are due partly at least to the fact that seedless hops are produced, since the seeded product is discriminated against in the market.‡ In other cases the variety grown is important as affecting yields, but the highest-yielding varieties are not always the most desirable from a market standpoint. The United States, England, and Canada averaged nearly the same in yields during 1925-1929, the yield of Great Britain being slightly above that of the United States or Canada.

\*The war years are here omitted owing to the abnormal conditions then existing. World and Continental European estimates were computed from annual hop reports of Joh. Barth & Sohn, hop merchants, Nuremberg, Bavaria.

†For individual countries on the Continent see footnote of Table I.

‡See also discussion on page 51.

TABLE I. HOPS: AVERAGE YIELD PER ACRE, LEADING COUNTRIES OF THE WORLD, 1900-1913; 1919-1930.\*

Year	Continental Europe†	England	United States	Canada	Australia	World
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
Average 1900-1908 .....	‡	1,002	1,062	‡	1,179§	‡
Average 1909-1913 .....	510	977	1,042	1,556	1,281	683
1919 .....	527	1,264	1,189	760	1,056	830
1920 .....	750	1,499	1,224	1,695	1,337	1,039
1921 .....	401	998	1,087	1,705	1,537	683
1922 .....	660	1,274	1,186	1,343	1,383	932
1923 .....	442	1,030	1,071	1,972	1,470	705
1924 .....	937	1,920	1,360	1,604	1,495	1,294
1925 .....	750	1,514	1,404	1,673	1,261	1,048
1926 .....	651	1,452	1,516	1,627	1,449	938
1927 .....	847	1,242	1,246	1,375	1,875	992
1928 .....	590	1,141	1,257	922	1,595	767
1929 .....	714	1,677	1,334	1,240	1,648	941
1930 .....		1,417	1,202	1,280		
Average 1919-1924 .....	619	1,331	1,186	1,513	1,380	914
Average 1925-1929 .....	710	1,405	1,351	1,367	1,565	939

\* Sources of information:

Continental Europe and World figures were taken from annual hop reports of Joh. Barth &amp; Sohn, Nuremberg, Bavaria.

Figures for England, Canada, and Australia, from same sources as indicated in footnote Table XIX (Appendix). United States figures same as in Table IV.

† Averages for leading countries as follows:

Germany: 1909-1913, 447 pounds; 1919-1924, 523 pounds; 1925-1929, 591 pounds.

Austria-Hungary: 1909-1913, 550 pounds.

Czechoslovakia: 1919-1924, 591 pounds; 1925-1929, 712 pounds.

Yugoslavia: 1919-1924, 833 pounds; 1925-1929, 637 pounds.

France: 1909-1913, 988 pounds; 1919-1924, 776 pounds; 1925-1929, 959 pounds.

Belgium: 1909-1913, 1,355 pounds; 1919-1924, 1,173 pounds; 1925-1929, 1,567 pounds.

Poland: 1919-1924, 584 pounds; 1925-1929, 776 pounds.

These averages were computed from official sources with the following exceptions: Germany, Czechoslovakia, Yugoslavia, and Poland—years, 1919-1924 and 1925-1929 from annual reports of Joh. Barth &amp; Sohn.

‡ No data.

§ Eight-year average.

|| Average, 1910-1913.

## NATIONAL AND REGIONAL TRENDS

Oregon's position of relative ascendancy in national hop production is indicated in Figure 5 and Tables II and III, which show that in 1879 Oregon had scarcely 1 percent of the United States crop; whereas by 1929 more than 55 percent of the crop was grown in this state. California, it will be observed, increased in relative importance until 1919, but thereafter its production declined considerably. The trend in Washington was down from 1889 to 1919, but a recovery took place in the following period. Figure 5 shows that a definite and continued shift of the hop industry from New York and Wisconsin to the Pacific Coast states has taken place since 1869. As is noted in Table III, the combined production of Oregon, Washington, and California amounted to only 9 percent of the national crop in 1879, but increased to 96 percent by 1919. Since 1919, New York's crop has declined still further and, at the present time, probably amounts to no more than 1 or 2 percent of the United States' total production. ¶

Those who are familiar with conditions in Wisconsin and New York are of the opinion that competition of the Pacific Coast states was the chief factor

¶ New York production for 1929 is not shown in Figure 5, since the 1929 Federal Census data are not yet available for use at this writing. Estimates obtained from those in the trade indicate that hop production in New York State has declined to the point where only a few hundred thousand pounds are being grown at the present time.

TABLE II. HOPS: ACREAGE AND PRODUCTION BY LEADING STATES IN THE UNITED STATES, 1849-1929.\*

Item	Oregon	Washington	California	New York	Wisconsin	All other states	United States
Acreage:	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
1879.....	304	534	1,119	39,072	4,439	1,332	46,800
1889.....	3,130	5,113	3,974	36,670	967	358	50,212
1899.....	15,433	5,296	6,890	27,532	342	120	55,613
1909.....	21,770	2,433	8,391	12,023	30	46	44,693
1919.....	5,629	1,129	8,118	1,024	.....	54	15,954
1929.....	17,000	2,900	5,000	†	†	†	24,900
Production:	<i>Thousands of pounds</i>	<i>Thousands of pounds</i>	<i>Thousands of pounds</i>	<i>Thousands of pounds</i>	<i>Thousands of pounds</i>	<i>Thousands of pounds</i>	<i>Thousands of pounds</i>
1849.....	.....	.....	.....	2,536	16	945	3,497
1859.....	.....	.....	.....	9,672	136	1,184	10,992
1869.....	10	6	625	17,559	4,630	2,627	25,457
1879.....	244	703	1,444	21,629	1,967	559	26,546
1889.....	3,614	8,313	6,547	20,063	429	205	39,171
1899.....	14,676	6,814	10,125	17,332	165	98	49,210
1909.....	16,583	3,433	11,995	8,677	13	18	40,719
1919.....	4,788	1,616	12,610	724	.....	23	19,761
1929.....	18,445	5,075	9,700	†	†	†	33,220

\* Sources of data: 1879-10th Census of the United States, Vol. III, page 251; 1889-11th Census of the United States, House Miscellaneous Documents, Vol. 50, Part 10, pages 91, 97, 107, 115; 1899-12th Census of the United States, Vol. VI, Part II, page 594; 1909-13th Census of the United States, Vol. V, page 699; 1919-14th Census of the United States, Vol. V, page 850. Hop Production: 1849, 1859, 1869-U. S. Department of Agriculture, Bureau of Statistics, Bulletin No. 50, "Hops in Principal Countries". For 1929, data from same source as in Table XXII (Appendix).

† No definite estimates available for these states at the present writing. The crop of these states, however, probably amounted to no more than 1 or 2 percent of United States total production in 1929.

TABLE III. HOPS: PERCENTAGE DISTRIBUTION OF ACREAGE AND PRODUCTION BY LEADING STATES IN THE UNITED STATES, 1849-1929.†

Item	Oregon	Washington	California	New York	Wisconsin	All other states	United States
Acreage:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
1879.....	.6	1.1	2.4	83.5	9.5	2.9	100.0
1889.....	6.2	10.2	7.9	73.0	1.9	.8	100.0
1899.....	27.8	9.5	12.4	49.5	.6	.2	100.0
1909.....	48.7	5.4	18.8	26.9	.1	.1	100.0
1919.....	35.3	7.1	50.9	6.4	0.0	.3	100.0
1929.....	68.3	11.6	20.1	\$	\$	\$	100.0
Production:	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
1849.....	0.0	0.0	0.0	72.5	.5	27.0	100.0
1859.....	0.0	0.0	0.0	88.0	1.2	10.8	100.0
1869.....	0.0	0.0	2.5	69.0	18.2	10.3	100.0
1879.....	.9	2.7	5.4	81.5	7.4	2.1	100.0
1889.....	9.3	21.2	16.7	51.2	1.1	.5	100.0
1899.....	29.8	13.0	20.6	35.2	.3	.2	100.0
1909.....	40.7	8.4	29.5	21.3		.1	100.0
1919.....	24.2	8.2	63.8	3.7	0.0	.1	100.0
1929.....	55.5	15.3	29.2	\$	\$	\$	100.0

† Computed from Table II.

\$ See footnote, Table II.

|| Included in "All other states".

in putting the Eastern growers out of the hop business. This, coupled with the advent of national prohibition and consequent falling-off in hop consumption, caused a lowering of prices to such an extent that growers could not continue to produce hops at a profit. The lower average yields obtained,<sup>†</sup> together with the struggle against diseases and insect pests which became more and more difficult to control, increased the cost of production and thereby enabled Pacific Coast growers to produce hops cheaper than could growers in New York.

<sup>†</sup> See Table IV and discussion on page 21.

**PERCENTAGE DISTRIBUTION OF HOP PRODUCTION,  
BY LEADING STATES IN THE UNITED STATES  
1849-1929**

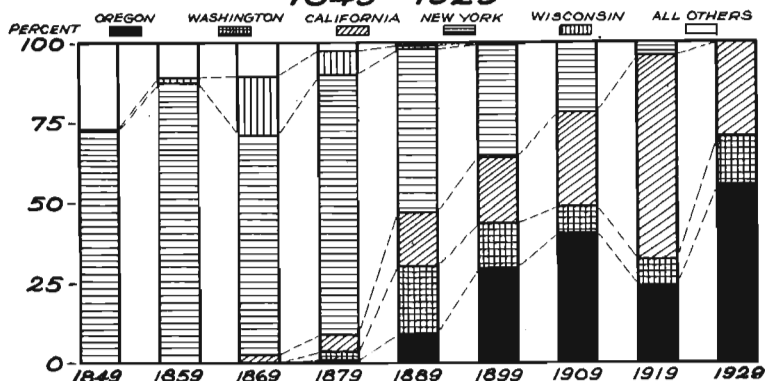


Figure 5.

**Yearly production trends.** The foregoing Federal Census figures, while suitable for revealing long-time shifts in geographic location of hop production, are inadequate for showing the growth of the industry either for the country at large or for individual states. In Figure 6 and Table XXII (Appendix) are presented annual production estimates for leading states and the United States from 1889 to 1930.\* The national trend, it will be observed, was upward from 1889 to 1913, after which a sharp decline was registered, reaching a low level in 1918.† Production since 1918 has shown a moderate upward tendency, although the 1930 crop was smaller than in any year since 1923.

Oregon's production, which was less than that of either California or Washington in 1889-1891, increased very rapidly in the years following, and by 1895 exceeded in amount the product of either of these states. Oregon's position as the leading state in hop production was maintained until 1915, after which a precipitous decline took place, leaving California in the lead for several years. Growers in Oregon apparently found it profitable to restore their production after 1918, for while California continued to decline, Oregon's crop was distinctly on the increase. Production in the state of Washington has been maintained on about the same level over the entire period under consideration. In harmony with Oregon and California, Washington's crop reached a low level in 1918. Some recovery is noted after 1918, but a falling-off again took place in 1929-30. All three states showed a decline in 1930 compared to 1929.

The general decline of production in New York State after 1894 is clearly indicated in Figure 6. While New York's crop equalled or exceeded the combined crops of Oregon, Washington, and California from 1889 to 1892, production soon fell so rapidly that by 1897 the Oregon crop alone exceeded that of New York. It will be noted from Figure 6 that the aggregate production of the Pacific Coast states trended definitely upward from 1889-1891 to 1915-16, but since the sharp decline of 1917-18, Pacific Coast production has been maintained on about the same level.

\* For acreage figures in leading states from 1915 to 1930, see Table XXIII (Appendix).

† It is believed that the United States hop crop during the years 1915 to 1919 was somewhat underestimated. See footnote, Table XII, page 42.

# **PRODUCTION OF HOPS IN THE UNITED STATES AND LEADING PRODUCING STATES, 1889-1930**

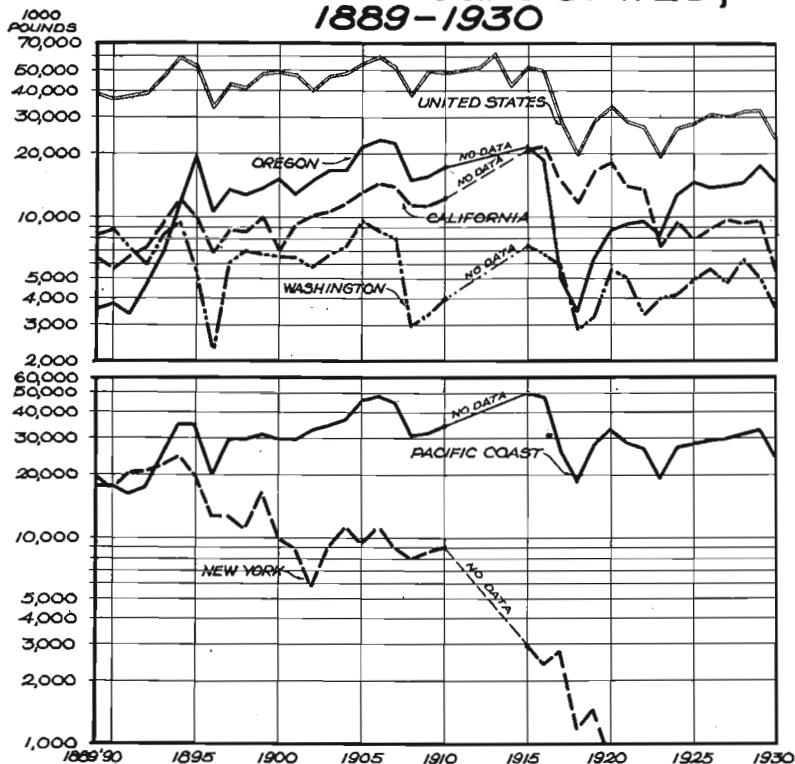


Figure 6.

The rapid increase in beer output both at home and abroad was, no doubt, responsible for the upward trend in United States hop production from 1890 to 1913.\* With the advent of prohibition in America, the demand for hops fell off sharply and prices declined to the point where hop growing became unprofitable. Oregon growers curtailed their production much more than did growers in California or Washington, but made rapid recovery in the years following. After the War, foreign trade in hops was greatly stimulated† and a partial recovery of national production is noted, although Table XXII (Appendix) indicates that the 1925-1929 average crop of hops amounted to only three-fifths of the 1910-1914 average. The sharp decline of production in 1930 was due to a curtailed acreage, coupled with lower yields per acre in Washington and California.‡

**Comparative yields, Oregon and other states.** According to the statistics presented in Figure 7 and Table IV, Oregon hop yields, when viewed from the

\* See Table XII and discussion on page 42.

† Figure 15 and discussion on page 35.

‡ See Table IV, page 21, and Table XXIII (Appendix).

standpoint of state averages, have not measured up to the yields of Washington or California. The 1924-1930 average indicates that yields in both Washington and California run considerably higher than in Oregon. This places the United States average yield above that of Oregon also, since almost the entire national production is now confined to the Pacific Coast States. New York yields, on the other hand, averaged appreciably lower than yields in Oregon during the years in which yield estimates were made for that state. The reason generally attributed to the higher average yields in Washington and California

### HOPS: AVERAGE YIELD PER ACRE, LEADING PRODUCING STATES AND THE UNITED STATES 1899-1930

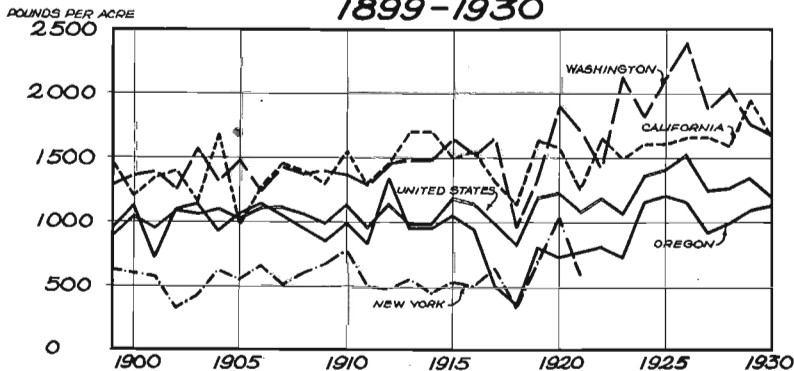


TABLE IV. HOPS: AVERAGE YIELD PER ACRE IN LEADING STATES AND THE UNITED STATES, 1899-1930.\*

Year	Oregon	Washington	California	New York	United States
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
Average, 1899-1904.....	992	1,366	1,376	529	1,023
Average, 1905-1910.....	1,010	1,382	1,326	624	1,072
Average, 1911-1916.....	1,013	1,479	1,532	502	1,069
Average, 1917-1923.....	667	1,584	1,432	656†	1,081
1919.....	800	1,340	1,625	690	1,189
1920.....	725	1,910	1,575	1,040	1,224
1921.....	770	1,700	1,250	580	1,087
1922.....	800	1,410	1,640	.....	1,186
1923.....	722	2,123	1,480	.....	1,071
1924.....	1,150	1,817	1,600	.....	1,360
1925.....	1,200	2,116	1,800	.....	1,404
1926.....	1,150	2,380	1,650	.....	1,516
1927.....	907	1,867	1,650	.....	1,246
1928.....	982	2,020	1,580	.....	1,257
1929.....	1,084	1,750	1,940	.....	1,334
1930.....	1,117	1,660	1,650	.....	1,202
Average, 1924-1930.....	1,084	1,944	1,667	.....	1,331

\* Sources of data: 1879, 1889, and 1899 from the 10th, 11th and 12th Census of the United States; 1900 through 1912 from October issues of the U. S. Department of Agriculture "Crop Reporter"; year 1913 from the U. S. Department of Agriculture "Agricultural Outlook", October 16, 1914; 1914 from U. S. Department of Agriculture "Monthly Crop Reporter", October, 1925; Oregon and California for 1915, 1916, and 1917 from December issue of "Monthly Crop Reporter", 1917; other statistics for 1915 through 1928 from "A Compendium of Hop Statistics", compiled by Wm. A. Schoenfeld, Regional Representative, and John Marshall, Jr., Federal Farm Board. Oregon figures for 1929 and 1930 from Oregon hop dealers' special reports. Washington and California yields for 1929 and 1930 from December, 1930, issue of U. S. Department of Agriculture "Crops and Markets".

† Average for years 1917-1921.

is the fact that most of the hops in those states are grown under irrigation or on moist bottom-lands, while in Oregon a third or more of the acreage is located on main Valley floor and hill lands.\* Hops that are grown on rich bottom-lands in Oregon return yields that are virtually on a par with those of Washington and California.

Figure 7 and Table IV indicate that Oregon hop yields were maintained on about the same level over the period 1899 to 1916, averaging approximately 1,000 pounds per acre. In the years following, the yards were neglected owing to poor prices and yields accordingly declined. Recovery is noted in the years after 1918, however, with average yields in 1924-1930 above the pre-war level by some seventy pounds per acre. The location of hop yards on better soil types is believed to be the main reason for the present higher average yields in Oregon as compared to former years.

In contrast to the Oregon situation, yields in both Washington and California showed a general upward tendency over the whole period, 1899-1930. Yields in these states declined temporarily during the War, but recovered quickly and attained even higher levels than before. Washington yields increased faster than yields of California.

The trend for the United States as a whole is seen to have been but slightly upward from 1899 to 1923. In the five-year period 1899-1904, the national average was 1,023 pounds per acre in comparison with 1,081 pounds during 1917-1923. This figure increased to 1,331 pounds in 1924-1930, which is 247 pounds above the Oregon average for the same period.

\*See discussion on page 31.

#### **DISTRIBUTION OF HARVESTED HOP ACREAGE IN OREGON, 1930**

*Legend—One Dot Represents 20 Acres*

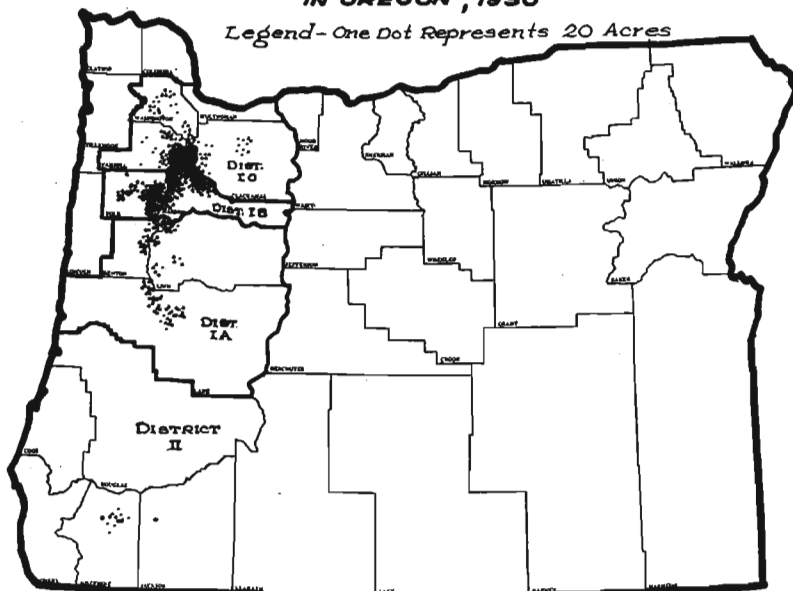


Figure 8.

## THE SITUATION IN OREGON

### GEOGRAPHIC LOCATION

Reference to Figure 8 shows that, aside from a small acreage in Jackson and Josephine counties, Oregon's hop industry is at present confined entirely to the Willamette Valley area. Of the counties in which hops are grown, Marion county easily takes the lead, this county having been credited with fully half the state hop acreage in 1930, while Polk county, adjoining, ranks second (Figure 9 and Table V). In fact, these two counties had three-fourths of the state's total acreage in 1930. Other counties in their order of rank are as follows: Lane, Clackamas, Yamhill, Washington, Linn, Benton, Josephine, and Jackson. Variations of soil and climate, differences in systems of farming practiced, and the availability of labor at harvest time are no doubt the principal factors which have determined the geographic location of the hop industry in Oregon.

### *HOPS: HARVESTED ACREAGE BY COUNTIES IN OREGON, 1930*

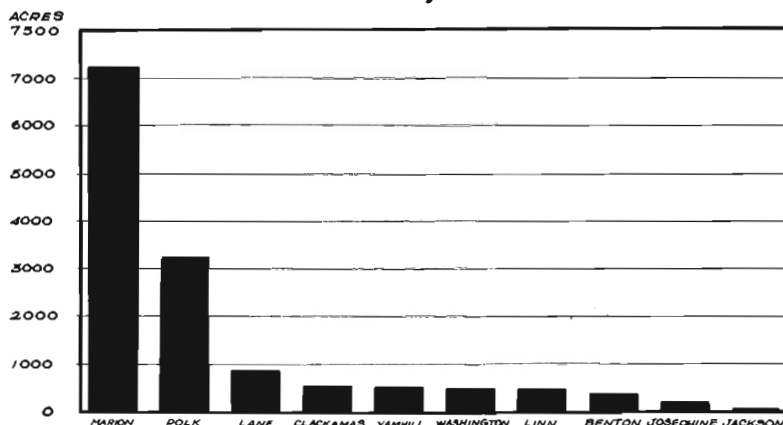


Figure 9.

### STATE ACREAGE AND PRODUCTION TRENDS

A discussion of production trends for the state as a whole has already been presented.\* Statistics are lacking to show annually, over a period of years, the extent of non-bearing and idle hop acreages as compared to harvested acreage in Oregon. It normally requires one year after planting for hops to come into bearing, but, on the other hand, it is not at all uncommon for growers to harvest so-called "baby crops" from their patches the same year as planted, which would then be included as bearing acreage. Also, when prices are unfavorable some growers may leave a part of their acreage idle for a year or two, with the intention of restoring it when market prospects appear brighter.

\* See discussion on pages 19-20.

It is estimated that in 1930 there were more than 2,100 idle acres of hops in Oregon,\* that is, mature yards from which no hops were harvested. In the same year approximately 1,300 acres were plowed out; but very few new yards were planted, hence the lower harvested acreage in 1930 as compared to 1929. Stated in percentage terms, about 12 percent of the 1929 hop acreage in Oregon remained idle during 1930, while  $7\frac{1}{2}$  percent of the acreage was plowed out.

With more favorable prices ruling this year (1931), the situation is apparently being reversed. Few old yards have been plowed out, while a fair acreage of new plantings is reported. It is also probable that a good part of the 1930 idle acreage is being restored to production.

### DISTRICT AND COUNTY TRENDS IN OREGON

For convenience in study the state has been divided into geographic districts as outlined in Figure 8. District I embraces all the Willamette Valley counties and is further subdivided into District I(a), which includes Lane, Linn, and Benton counties; District I(b), which includes Marion and Polk counties; and District I(c), which takes in Yamhill, Washington, Clackamas, and Multnomah counties. In District II are included Douglas, Jackson, Josephine, and all other counties that have raised hops at any time in the past.

**District trends.** From Figure 10 and Tables V and VI it is seen that District I (the Willamette Valley counties) has held a position of dominating importance ever since 1879. Over the entire period from 1879-1930, this area has never had below 95 percent of the total hop acreage in Oregon. There have been shifts within the district, however, as reference to Figure 10 shows. It is observed that District I(b) (Marion and Polk counties) increased in importance relative to other districts from 1879 onward, and by 1919 had three-fourths of the state acreage. Since 1919 the percentage has remained about the same. District I(a) declined from three-fifths of the state total

\* Information obtained from confidential records of Oregon hop dealers.

### PERCENTAGE DISTRIBUTION OF HOP ACREAGE BY DISTRICTS IN OREGON, 1879-1929

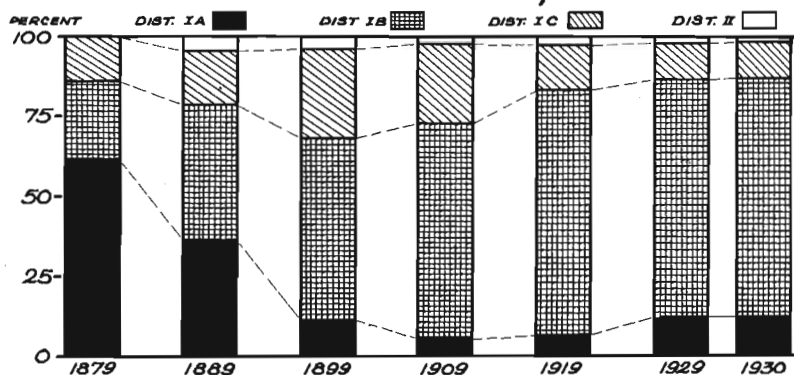


Figure 10.

acreage in 1879 to less than 6 percent in 1909, but recovered somewhat after that, and now has approximately one-eighth of the total. The third sub-division under District I; namely, District I(c), is shown to have increased in relative importance until 1899, after which a declining tendency is noted. In 1930 it held nearly the same relative position as District I(a).

From the foregoing it is obvious that hop production has never attained any considerable importance outside of the Willamette Valley counties.

TABLE V. ACREAGE OF HOPS BY COUNTIES IN OREGON, 1879-1930.\*

County and district	1879	1889	1899	1909	1919	1929	1930
<i>District Ia.</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Lane.....	143	733	879	716	122	917	853
Linn.....	30	401	589	279	42	575	483
Benton.....	17	27	328	204	213	651	374
Total.....	190	1,161	1,796	1,199	377	2,143	1,710
<i>District Ib.</i>							
Polk.....	35	340	2,568	4,497	1,576	3,952	3,233
Marion.....	37	974	6,236	10,223	2,752	8,856	7,236
Total.....	72	1,314	8,804	14,720	4,328	12,808	10,469
<i>District Ic.</i>							
Yamhill.....	8	156	1,801	2,292	246	602	540
Washington.....	6	54	720	1,675	392	644	503
Clackamas.....	26	306	1,651	1,472	141	799	557
Multnomah.....	2	4	94				
Total.....	42	520	4,266	5,439	779	2,045	1,600
Total District I.....	304	2,995	14,866	21,358	5,484	16,996	13,779
<i>District II.</i>							
Douglas.....		49	283	82	11		
Jackson.....		6	93	61	25	23	25
Josephine.....		65	160	248	109	274	194
All others.....		15	31	21			
Total District II.....		135	567	412	145	297	219
State Total.....	304	3,130	15,433	21,770	5,629	17,293	13,998

\* Sources of data: 1879, from the 10th Census of the United States, Vol. III, pages 305 and 307; 1889, from the 11th Census of the United States, House Miscellaneous Documents, Vol. 50, Part 10, page 447; 1899, from the 12th Census of the United States, Vol. VI, Part II, page 586; 1909, from the 13th Census of the United States, Vol. VII, pages 418, 149, 420, 421; 1919, from the 14th Census of the United States, Vol. VI, Part 3, pages 327, 328, 329, 330; 1929 and 1930, from Oregon hop dealers, special reports.

TABLE VI. HOPS: PERCENTAGE DISTRIBUTION OF ACREAGE BY COUNTIES IN OREGON, 1879-1930.\*

County and district	1879	1889	1899	1909	1919	1929	1930
<i>District Ia.</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Lane.....	47.0	23.4	5.7	3.3	2.2	5.3	6.1
Linn.....	9.9	12.8	3.8	1.3	.7	3.3	3.4
Benton.....	5.6	.9	2.1	.9	3.8	3.8	2.7
Total.....	62.5	37.1	11.6	5.5	6.7	12.4	12.2
<i>District Ib.</i>							
Polk.....	11.5	10.9	16.7	20.7	28.0	22.8	23.1
Marion.....	12.2	31.1	40.4	47.0	48.9	51.3	51.7
Total.....	23.7	42.0	57.1	67.7	76.9	74.1	74.8
<i>District Ic.</i>							
Yamhill.....	2.6	5.0	11.7	10.5	4.4	3.5	3.8
Washington.....	2.0	1.7	4.7	7.7	7.0	3.7	3.6
Clackamas.....	8.6	9.8	10.7	6.8	2.5	4.6	4.0
Multnomah.....	.6	.1	.6	0.0	0.0	0.0	0.0
Total.....	13.8	16.6	27.7	25.0	13.9	11.8	11.4
Total District I.....	100.0	95.7	96.4	98.2	97.5	98.3	98.4
<i>District II.</i>							
Douglas.....		1.6	1.8	.4	.2	0.0	0.0
Jackson.....		.1	.6	.3	.4	.1	.2
Josephine.....		2.1	1.0	1.1	1.9	1.6	1.4
All others.....		.5	.2	0.0	0.0	0.0	0.0
Total District II.....		4.3	3.6	1.8	2.5	1.7	1.6
State Total.....	100.0	100.0	100.0	100.0	100.0	100.0	100.0

\* Computed from Table V.

Douglas, Jackson, and Josephine counties are credited with practically all the remainder, which in the past five decades has ranged from 1.6 to 4.3 per cent of the state total.

**County trends.** Figure 11 shows that Marion and Polk counties attained a lead over all others at an early date, and have held the same relative position ever since. There was a pronounced acreage expansion in Marion, Polk, Yamhill, Washington, and Clackamas counties from 1879 to 1909, this being followed by a rapid decline in the next decade, but with a substantial recovery by 1929. All counties showed a decrease in 1930 as compared to 1929. As regards all other counties below Marion and Polk, there has been considerable shifting in order of rank over the past five decades. It will be observed, however, that the difference in acreage between these other counties since 1919 has not been great.

### HOPS: ACREAGE IN LEADING PRODUCING COUNTIES OF OREGON, 1879-1930

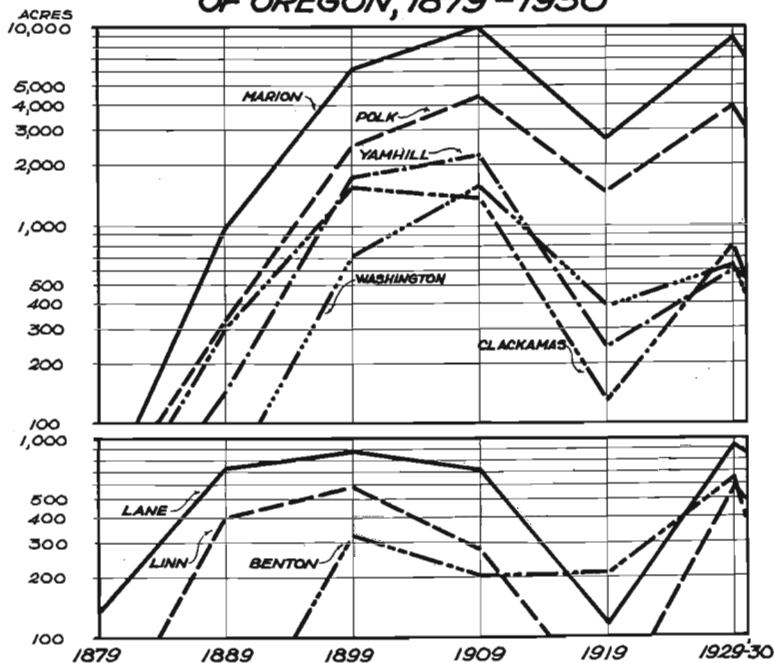


Figure 11.

### ACREAGE DISTRIBUTION ON FARMS

A high degree of specialization characterizes the hop industry in Oregon, as is shown in Figures 12(a) and 12(b) and Table VII. The entire hop acreage in this state is confined to some 535 farms,\* which represent only 1 per cent of

\* Distinction should be made between number of hop farms and number of hop growers. There are some growers who operate two or more hop ranches. The actual number of hop growers in Oregon is, therefore, slightly under the foregoing figure.

all farms in the state and scarcely 2 percent of the farms in those counties where hops are grown commercially.\*

In Figures 12a and 12b and Table VII it is seen that only 4.3 percent of the hop farms in 1929 had more than 100 acres of hops but that these farms could actually claim 27.4 percent of the state acreage in that year. Less than 14 percent of the hop farms reported more than 50 acres of hops, but nearly half the total acreage was grown on these farms in 1929. By going farther down the scale it is observed that farms having from 11 to 20 acres of hops made up almost one-third of the total number, but these same farms had less than 15 percent of the total acreage. The small farms at the bottom of the scale, numbering nearly one-fourth of all farms growing hops, actually had less than 6 percent of the acreage.

\*The 1930 Federal Census places the number of farms in Oregon at 55,153 and the number in Lane, Linn, Benton, Polk, Marion, Yamhill, Washington, Clackamas, Jackson, and Josephine counties at 29,918.

### PERCENTAGE DISTRIBUTION OF HOP FARMS IN OREGON ACCORDING TO HOP ACREAGE PER FARM, 1929

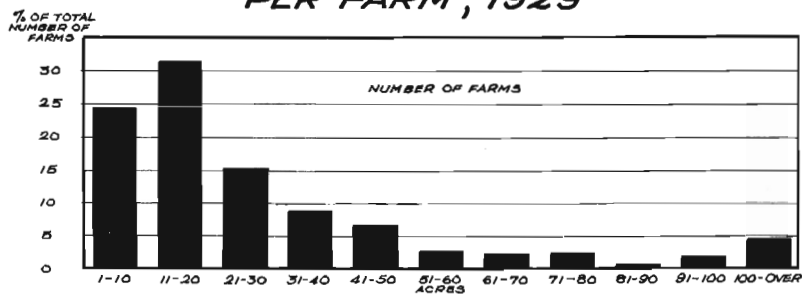


Figure 12a.

### PERCENTAGE DISTRIBUTION OF TOTAL HOP ACREAGE BY FARMS HAVING VARIOUS ACREAGES OF HOPS, OREGON, 1929

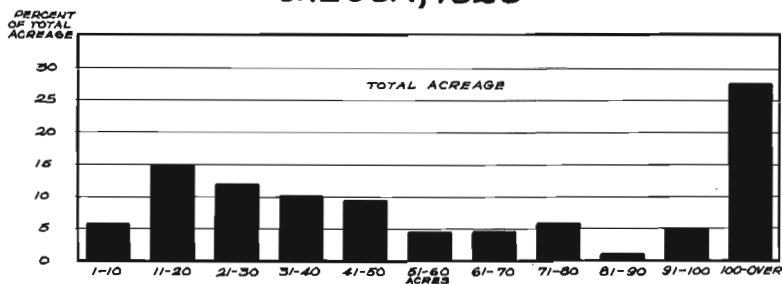


Figure 12b.

TABLE VII. CLASSIFICATION OF HOP FARMS IN OREGON ACCORDING TO HOP ACREAGE PER FARM, 1929.\*

Class interval	Number of farms	Total acreage	Average acreage per farm	Percentage of total	
				Number of farms	Acreage
<i>Acres</i>		<i>Acres</i>	<i>Acres</i>	<i>Percent</i>	<i>Percent</i>
1-10.....	130	985	7.6	24.3	5.7
11-20.....	168	2,553	15.2	31.4	14.7
21-30.....	82	2,052	25.0	15.3	11.8
31-40.....	47	1,724	36.7	8.8	10.0
41-50.....	35	1,624	46.4	6.6	9.4
51-60.....	14	781	55.8	2.6	4.5
61-70.....	12	802	66.8	2.2	4.6
71-80.....	13	1,003	77.2	2.4	5.8
81-90.....	2	180	90.0	.4	1.0
91-100.....	9	878	97.6	1.7	5.1
101 and over.....	23	4,749	206.5	4.3	27.4
Total.....	535	17,331	32.4	100.0	100.0

\* These data were computed from special reports of Oregon hop dealers, 1929 acreage.

On some farms hops are grown to the exclusion of all other farm enterprises. This enables the grower to devote his entire attention to the one enterprise, hops. There are many growers, however, who feel that, owing to the hazards of price change, insects and other pests frequently attending the hop business, a balancing of farm enterprises is desirable; and therefore the inclusion of one or more minor enterprises on these ranches is frequently encountered. Some growers include fruits and nuts in their farming scheme, while others grow their own grain and hay for the stock. The practice of turning stock into the hop yards during certain seasons of the year has led a number of growers to retain a band of sheep for this purpose. Generally speaking, however, hops furnish the major source of cash income on farms where grown, and in many cases this crop is practically the sole source of cash income.

### VARIETIES AND YIELDS

**Varieties.** Three main varieties of hops are being grown in Oregon at the present time: namely, the English or Late Cluster, the Early Cluster and Fuggles. Table VIII indicates that the Late Cluster variety is of outstanding importance, involving as it does, more than three-fourths of the state total hop acreage. This variety has been grown in Oregon for many years, is a hop that is rich in lupulin content, and has a well established reputation in the trade. Yields of Late Cluster average higher for the state as a whole than do either of the other two varieties. (See Table IX.)

Often found with the Late Cluster is the Canadian Red Vine, which is also classed as a late variety. It is said to have been one of the earliest varieties introduced into the state of Oregon. There are now very few exclusive Red Vine yards in the state, but quite a number of hills are found growing in Late Cluster yards. They mature at about the same time as the Late Cluster, but are harder to pick and do not yield so well. Another objection to the Canadian Red Vine is its great susceptibility to red spider. Some think that a few Red Vine hops mixed in with the Late Cluster are beneficial from the standpoint of market quality of the product.

TABLE VIII. HOPS: ACREAGE BY VARIETIES IN OREGON, 1928, 1929 and 1930.\*

Year	Acreage				Percentages of total			
	Fuggles	Early cluster	Late cluster	Total	Fuggles	Early cluster	Late cluster	Total
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
1928.....	1,989	1,521	13,006	16,516	12	9	79	100
1929.....	1,953	2,025	13,315	17,293	11	12	77	100
1930.....	1,349	1,868	10,781	13,998	10	13	77	100
Average, 1928-1930.....	1,764	1,805	12,367	15,936	11	11	78	100

\* Data computed from Oregon hop dealers' special reports. It will be noted that the total hop acreage here recorded in 1928 and 1929 is slightly lower than the figures given in Table XXIII (Appendix).

TABLE IX. HOPS: AVERAGE YIELD PER ACRE BY VARIETY, OREGON, 1928, 1929 AND 1930.\*

Year	In bales of 195 pounds net			In pounds		
	Fuggles	Early cluster	Late cluster	Fuggles	Early cluster	Late cluster
	<i>Bales</i>	<i>Bales</i>	<i>Bales</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
1928.....	4.31	3.59	5.33	841	700	1,039
1929.....	4.35	4.89	5.85	848	954	1,141
1930.....	4.65	5.30	5.93	907	1,034	1,156
Average, 1928-1930.....	4.44	4.59	5.70	865	896	1,112

\* Computed from Oregon hop dealers' special reports.

Hops are of such a nature that they must be harvested within a limited period of time in order that the quality of the product is not impaired. Therefore, in order to grow a certain acreage of hops with a minimum of investment in drying kilns and other equipment, many growers aim to have a certain percentage of their hop acreage devoted to early-maturing varieties. There is also the additional factor of labor shortage at harvest time that induces growers to distribute the labor load as much as possible. Early Cluster and Fuggles are the two varieties used for this purpose at the present time. These varieties mature from ten days to two weeks earlier than Late Cluster, so that their harvest is out of the way by the time the main crop is ripe. In 1930, Early Cluster made up 13 percent of the state acreage, while Fuggles made up 10 percent (Table VIII).

The Early Cluster was started in Oregon several years ago and is said to have been propagated from early-maturing hills of the Late Cluster. There is usually no distinction made between these two varieties on the market, although they differ somewhat in their growth. Early Cluster yields the same as Late Cluster if planted on adapted soil, and in some cases actually yields more, but the state average yield is in favor of Late Cluster, as Table IX shows.\* Growers state that the Early Cluster is more subject to downy mildew, does not hold up so well at harvest time, and, in general, requires more careful cultural methods than the Late Cluster. Since this variety tends to go to pieces so quickly at harvest time, growers do not want too large an acreage.

\* The 1930 figures probably afford a fairer comparison of yields than the previous years, as many of the Early Cluster yards had not attained full bearing prior to 1930.

Fuggles, an English variety, has been grown in Oregon for a long time and is produced primarily for the English and Canadian markets. The Fuggles acreage declined in relative importance from 1928 to 1930, as Table VIII shows. This variety averages lower in yield than Clusters (Table IX) and requires a rich, sandy river-bottom soil to obtain good results. It has the advantage of being immune to downy mildew, particularly on the cone, and does not require as much spraying for spider and aphid as the cluster varieties. Formerly a premium of 2 cents or more per pound was obtained for Fuggles over the other varieties, but in the past two or three years this price advantage seems to have largely disappeared, due, no doubt, to the falling-off in exports to England and Canada.\* This, in turn, has influenced growers in Oregon to curtail their Fuggles acreage somewhat and to grow more Early Clusters in their stead. The mildew situation, however, is again increasing the interest in this variety.

**Yields.** A discussion of comparative hop yields in Oregon and other states has already been presented.† It was shown (1) that yields per acre in this state have averaged considerably under the yields of Washington or California, and (2) that while the Oregon yields declined greatly during the War, they have since recovered to such an extent that they are now above pre-war levels, the 1924-1930 average being 1,084 pounds in comparison with the 1911-1916 average of 1,013 pounds.‡ Two chief reasons may be attributed to the increased yield of recent years: (1) the replanting of yards on more favorable soil types, and (2) the adoption of improved production methods and practices on the part of growers.

Crop yields vary greatly from farm to farm, even in the same locality. Figure 13 shows the distribution of Late Cluster yields on 388 farms in Oregon in 1930.§ Nearly 6 percent of the growers reported under two bales of hops per acre in that year, while more than one-third had yields of from 4.0 to 5.9

\* See Figure 16, page 37.

† See pages 20-22.

‡ Table IV, page 21.

§ Data computed from Oregon hop dealers' special reports. Bales will net about 195 pounds of hops each.

### PERCENTAGE DISTRIBUTION OF LATE CLUSTER YIELDS ON FARMS IN OREGON, 1930

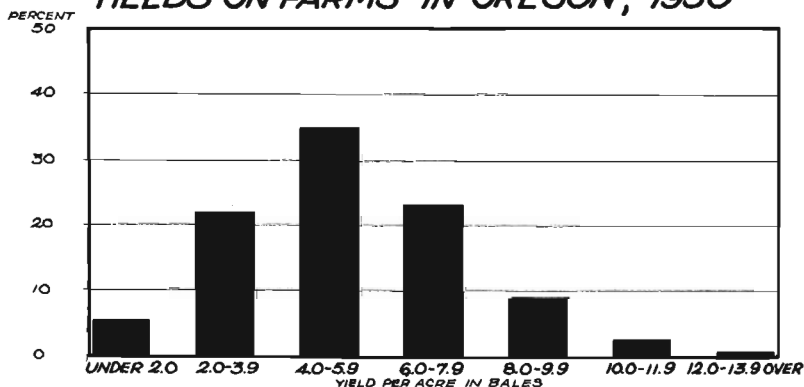


Figure 13.

bales per acre. At the other extreme, only 1.3 percent of the growers obtained an average of 12 or more bales of Late Clusters per acre. Differences of soil type are no doubt partly responsible for much of this variation. Perhaps of equal or even greater importance, however, is the fact that some producers have adopted better production practices than others, and by so doing have increased their yields accordingly.

### SOIL TYPES

Soil type is an important factor in determining the yield of hops and also has an effect on the market type of hop produced. The types of soil on which Oregon hops are grown fall into three main groups—namely, the river and stream bottom-lands, the main Valley floor, and the hill lands. It will be observed from Table X\* that nearly two-thirds of the state hop acreage is located on river and stream bottom-lands, while most of the remainder is found on main Valley floor soils. The strictly hill-land hops make up only a small percentage of the total. There is, of course, a great deal of variation within each of these three general classifications.

Turning first to the river and stream bottom-lands: As would naturally be expected, yields per acre on these lands average appreciably higher than on the Valley floor or hill lands. Hops grown on the bottom-lands are generally larger and greener than Valley floor or hill-land hops. Soils of this group may or may not be subject to overflow. Most of the bottom-land yards are included in the Chehalis and Newberg soil series (Table X). Chehalis soil series occupy the second bottoms while the Newberg series includes soils of the first bottom.†

\*The writer is indebted to Mr. C. F. Noakes, Salem, Oregon, for his valued assistance in plotting the hop yards onto soils maps, which were used as a basis for making the computations in Table X.  
†See Oregon Agricultural Experiment Station Circular 90, Meaning and Use of Willamette Soil Survey, pp. 9-11. There is, of course, considerable range in type within each series.

TABLE X. HOPS: ACREAGE AND YIELD IN OREGON, CLASSIFIED ON THE BASIS OF SOIL TYPE, 1929-1930.\*

Soil type	Acreage 1929	Percentage of state total	Yield per acre† Late clusters, 1930	
	<i>Acres</i>	<i>Percent</i>	<i>Bales</i>	<i>Pounds</i>
<i>Recent alluvial soils (Bottom lands)—</i>				
Chehalis.....	5,691	35.9	6.32	1,232
Newberg.....	3,482	22.0	6.21	1,211
All others‡.....	1,036	6.5	\$	\$
Total.....	10,209	64.4	6.09	1,188
<i>Old Valley filling soils (Main Valley floor)—</i>				
Willamette.....	1,732	10.9	5.46	1,065
Amity.....	2,246	14.2	4.76	928
All others  .....	1,113	7.0	\$	\$
Total.....	5,091	32.1	5.00	975
<i>Residual soils (Hill lands)—</i>				
Olympia.....	347	2.2	4.33	844
Melbourne.....	195	1.2	4.24	827
All others¶.....	21	.1	\$	\$
Total.....	563	3.5	4.25	829
Total.....	15,863	100.0	5.93	1,156

\* Data on acreages and yields of individual farms were obtained from Oregon hop dealers' special reports. Computed by plotting, in so far as possible, the 1929 hop acreages of individual growers on to county soils maps.

† Arrived at by averaging the Late Cluster yields of all growers whose yards consisted of 85 percent or more of the specified soil type.

‡ Primarily Wapato series; small amounts of Cove and Camas in addition.

§ Not computed.

|| Mostly Concord series; small amounts of Salem, Holcomb, Dayton, and Sifton.

¶ Practically all Aiken series.

Both types have good natural drainage, which is so essential in hop growing. As Table X shows, Late Cluster yields in 1930 averaged higher for these series than any of the other types shown.

Under the main Valley-floor group, the Willamette and Amity series are the most important. The Willamette series has good natural drainage and yields average somewhat higher here than they do on the Amity series, the drainage of which is more restricted. The hill land soils listed in Table X have good drainage, but owing to the lower availability of moisture during the growing season, yields average much lower than on the bottom-lands. The quality of hop produced, however, is good.

### CAPITAL OUTLAY AND COSTS

**Capital outlay.** Commercial hop production requires a large outlay of capital, a fact which should always be taken into account by those who plan to enter the business. Growers report a wide variation in investment per acre for buildings, implements, trellis, land, and miscellaneous items. Some are in a position to economize more than others, and thereby keep their investment down to a minimum. The averages which follow are based on estimates obtained from representative hop growers in Oregon, and should give a fair indication of average investment requirements under conditions that have existed during the past six or eight years.\*

ITEM	Investment per acre†
Land alone.....	\$175.00‡
Trellis, plants, planting, etc.....	85.00§
Buildings:	
Drying kilns, press, and store rooms.....	\$31.68
Picker shacks and tents.....	16.74
Total.....	\$98.42
Implements and machinery:	
Sprayers.....	\$11.84
Plows, disks, harrows, etc.....	7.25
Tractors.....	18.23
Trucks.....	6.30
Wagons, hop racks.....	2.54
Total.....	\$46.16
Other items:	
Sacks and baskets.....	\$8.58
Tools and miscellaneous.....	5.21
Horses.....	4.12
	\$17.91
GRAND TOTAL.....	\$422.49

\* Averaged from estimates of growers representing approximately 3,000 acres of hops. With the generally lower level of prices existing at the present time, it is likely that under the new scale of prices, capital investment will average somewhat lower than in the preceding years.

† The term "Investment" here does not necessarily mean cash investment. It is a frequent occurrence to find small growers who do most of the trellis and other construction work themselves, and in that way keep their cash expenditures to a minimum.

‡ Includes also irrigation systems where established. Lands suitable for hop production range in value from \$100 to \$450 per acre.

§ Ranges anywhere from \$70 to \$120 per acre. Includes cost of trellis construction, preparation of soil, plants, planting, etc.

|| Does not include buildings for tools and repairs, boarding house, barns, etc., that may be needed where hops are produced on a large scale.

As the foregoing figures indicate, the average investment in drying kilns, store rooms, picker shacks, and tents alone amounts to nearly \$100 per acre. Added to this it is found that implements and machinery, sacks, baskets, tools, etc., amount to at least \$60; the cost of establishing a yard, \$85, and land values, \$175; thus making a grand total of more than \$420 per acre for all items of capital investment. It should be borne in mind, of course, that a number of the items here included may be used for other farming operations as well as for hops, such, for example, as trucks, tractors, horses, plows, and wagons; so that in reality the entire amount represented in machinery and equipment cannot properly be counted as an outlay for hops. The extent to which this equipment is used for other crops depends entirely upon the type of farming practiced—on some farms it would be very little; on other farms, considerable. In any event, however, this equipment is considered essential for hop production, and in many cases it is used solely for that purpose.

**Costs.** The task of estimating the cost of producing hops in Oregon is complicated by the varied conditions under which the crop is grown. Without undertaking a detailed study of costs, one is likely to be misled by the estimates which various growers give as their costs. For example, some have in mind only the actual cash expense involved in growing and harvesting the crop, such as labor, supplies, and upkeep from year to year, while others include also a remuneration for unpaid family labor, depreciation, and interest on the investment. It is also a fact that the small growers (those having anywhere from 10 to 50 acres of hops) almost invariably report lower cash costs than the large growers. This is only to be expected since those having a small acreage are in a position to do a large part of the work themselves.

From the information at hand it appears that, under conditions of the past six or eight years, the cash expense for the average large grower having 100 acres or more of hops would be about 14c per pound,\* but ranging from as low as 11c up to as high as 17c with individual growers. This figure will cover all the items of cash expense, such as labor, taxes, interest on borrowed capital, supplies purchased, and repairs. Expenses connected with picking, drying, and baling usually run higher than the expense up until harvest time. To include full depreciation, interest on the net investment, and payment for own time it is likely that the total cost will average nearly 17c per pound. This figure, too, will vary with the individual circumstances.

In contrast with the foregoing, the growers with a smaller acreage will average about 12c per pound in cash outlay, ranging anywhere from 8c to 15c per pound with different producers. When allowing sufficient compensation for unpaid family labor and all other costs not recorded as cash expense, however, the total cost figure might not be much different from that indicated for the larger grower. There is no doubt that the farmer with a small acreage is in a position to pay more attention to details and can economize in more ways than the grower having a large acreage. These advantages, however, are frequently offset by the more skilled management and labor, and by better equipment which the large producers are in a position to use. It would be a difficult matter, therefore, to support the conclusion that one group enjoys a net competitive advantage over the other. Examples of successful operating units, both large and small, are to be found in Oregon.

\* Based on personal interview with a number of leading growers. Since the general level of prices has fallen so materially during the past year, it seems likely that, under the new scale of prices, cash expenses will average somewhat lower than in the preceding years, that is, provided other factors remain the same.

## TRENDS IN FOREIGN TRADE AND CONSUMPTION

### UNITED STATES FOREIGN TRADE IN HOPS

Foreign markets have for many years provided an important outlet for Pacific Coast hops. Figure 14\* indicates that, during the past five decades, domestic exports of hops from the United States have averaged anywhere from one-fourth to two-thirds of the total national production.† The percentage of exports to the United States' total production is shown to have increased from 1880-1884 to 1895-1899; then to have decreased during the period 1900-1904; but to have increased thereafter until 1920-1924, when, on the average, two-thirds of the national crop was exported. In the last period shown, 1925-1929, exports showed a decided falling-off, averaging 36 percent of production for the five-year period, but only 20 percent for the crop year 1929-30.

**HOPS: PERCENTAGE OF UNITED STATES PRODUCTION EXPORTED, BY CROP YEARS, 1880-'1929**

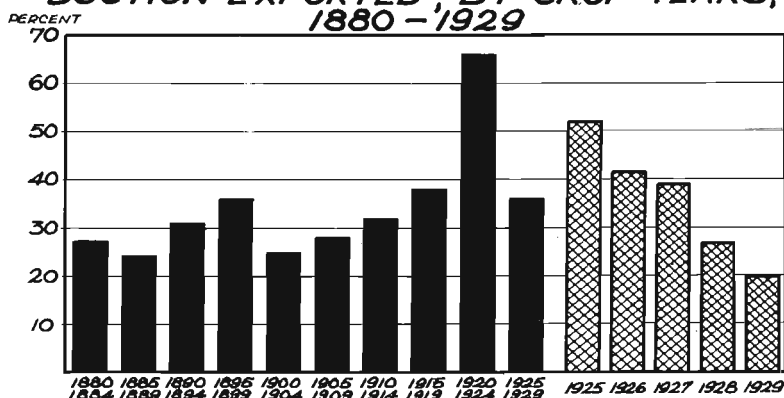


Figure 14.

A comparison of domestic exports, imports for consumption, and total production is presented in Figure 15.‡ It is observed from this figure that while exports fluctuated in cycles during the period 1890-1915, the long-time trend over this period was maintained on about the same level. War conditions in Europe brought about a great decline of exports from 1914-15 to 1917-18. After the War, however, exports increased very rapidly and by 1919-20 exceeded in volume the exports of any year since 1890. It will be noted that exports were actually a little larger than total national production in 1919 and 1923, owing no doubt to large carryover from previous years. A decided

\*The information upon which this figure is based was taken from Table XII.

†That is, when averaged by five-year periods as shown in Figure 14. Percentages in individual years will, of course, vary much more than in five-year periods.

‡Data taken from Table XII.

falling-off in the actual volume of exports during recent years is apparent from Figure 15.\*

The precipitous drop in hop exports after 1914 was due largely to war conditions in Europe. With the War ended it took several years to restore and replant the yards that had been abandoned; therefore Europe provided an excellent market for America's surplus hops which had been accumulating for some time. With the greatly increased production that has taken place in Europe since 1924, however, exports have again declined materially.

**IMPORTS FOR CONSUMPTION, DOMESTIC EXPORTS,  
AND PRODUCTION OF HOPS IN THE UNITED STATES,  
1890-1930**  
(YEARS BEGINNING JULY 1)

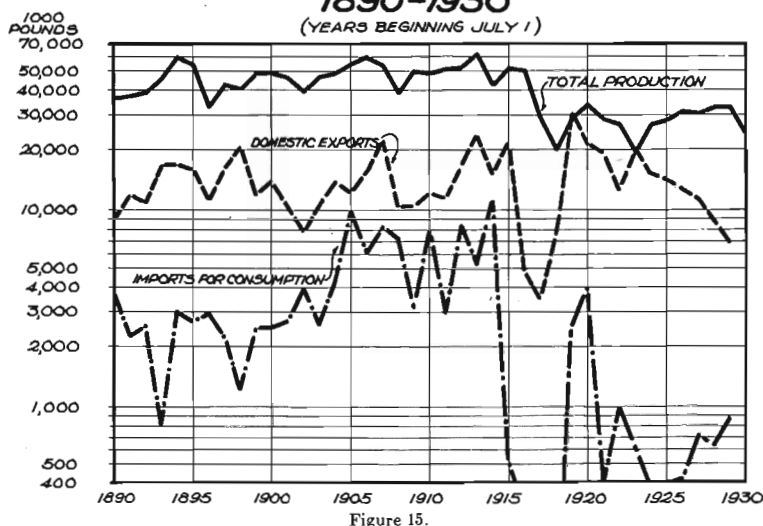


Figure 15.

As Figure 15 indicates, hop imports for consumption have, in years past, attained considerable importance despite the fact that the United States has been a large exporter of this product. There was a substantial increase in imports for consumption from 1898-99 to 1914-15, the volume in the decade 1905-1914 amounting to more than 45 percent of domestic exports.† The enormous drop after 1914 was due, no doubt, to greatly curtailed production abroad, coupled with the decreased demand for hops in America. A partial recovery of hop imports is noted in 1919 and 1920, but a decline took place again in the years following. It will be observed that despite our present high tariff of 24c per pound, imports have recently been on the increase, reaching 877,000 pounds in 1929-30,‡ in comparison with 385,000 pounds in 1924-25. Even the 1929-30 imports, however, amounted to scarcely more than 3 percent

\* Domestic exports of hops for the eight months beginning July 1, 1930, amounted to 5,208,584 pounds, in comparison with 6,110,662 pounds for the eight months beginning July 1, 1929. (As taken from the U. S. Dept. of Commerce "Monthly Summary of Foreign Commerce of the United States.")

† See Table XIII.

‡ Imports for consumption during the eight months beginning July 1, 1930, amounted to 728,914 pounds, as compared to 669,394 pounds for the same period in 1929-30. (From the U. S. Dept. of Commerce "Monthly Summary of Foreign Commerce of the United States.")

of all hops retained and received for consumption in the United States in that year, which compares to about 16½ percent in the decade preceding the World War.\*

**Exports and imports: Destination and origin.** As shown in Figures 16 and 17 the United Kingdom† and Canada are the primary export markets for United States hops at the present time. In 1930, three-fifths of the national hop exports went directly to the United Kingdom, while Canada was credited with one-third, leaving a remainder of but 5 percent for all other countries.‡ Viewed from the standpoint of actual volume exported to these countries during the past several years, however, there has been a substantial decline. These data as published by the United States Bureau of Foreign and Domestic Commerce are somewhat misleading owing to the fact that considerable quantities of hops have been shipped in transit through Canada to overseas countries, being destined primarily for the United Kingdom.§ The figures also show that large quantities of American hops were shipped to Continental European countries during the years 1922-1927, but since then the volume exported to those countries has been insignificant. Here again the data do not tell the whole story, as an appreciable part of the hops shipped from the United States to Belgium were later imported into England.|| In reality, therefore, England has taken a larger percentage of our exports during the past decade than Figure 17 indicates, although this percentage would not, of course, be as high as it was from 1910 to 1916.

Oregon hops, which are generally considered among the finest grown on the Pacific Coast, are particularly favored by English brewers for their high preservative value and richness of flavor, and for the fact that both of these properties are retained very well in storage. English brewers, however, maintain that Oregon hops can never be used alone in English beers, as the flavor and aroma are considered too strong.

During the years 1923-1926, when European prices were excessively high¶ as a result of insufficient crops, many of the Continental brewers used American hops to substitute for the home-grown product. As their production attained higher levels, the use of American hops was largely discontinued and exports to the Continent fell off accordingly. Brewers abroad contend that our hops are not suitable for the type of beverage to which consumers on the Continent have become accustomed.\*\* Figure 17 shows that almost no hops were exported to the Continent of Europe prior to the War; hence our trade with those countries was largely a temporary situation which we could not hope to make permanent. Importations of hops into the United States have, in

\* See Table XII, page 42. In this connection should be mentioned the fact that imports of lupulin (derivative of hops used for medicinal and chemical purposes) have increased since 1923, the annual figures being as follows:

1923 . . . . . 7,747 pounds	1926 . . . . . 11,150 pounds	1929 . . . . . 23,403 pounds
1924 . . . . . 8,990 pounds	1927 . . . . . 19,439 pounds	1930 . . . . . 27,664 pounds
1925 . . . . . 13,247 pounds	1928 . . . . . 37,213 pounds	

The import duty of 75c per pound is not in proportion to the 24c per pound for hops, since one pound of lupulin is equivalent to approximately 12 pounds of hops. The 1909-1914 average value of lupulin imports into the United States was \$33,740, in comparison with the 1925-1930 average of \$33,441, which indicates that imports of recent years have been about the same as they were before the War. (Data as computed from U. S. Bureau of Foreign and Domestic Commerce Reports. See footnote Table XXVI of the Appendix.)

† Including also Irish Free State in the present discussion.

‡ Based on data in Tables XXIV and XXV.

§ For instance, hop imports from the United States into Canada for consumption averaged 1,932,000 pounds in the twelve-year period 1920-1931; while United States exports to Canada averaged 2,818,000 pounds in 1919-1930. (Canada figures are for years ending March 31; United States figures are for calendar years.) This average annual difference of 886,000 pounds represents mostly in-transit shipments to Europe. See also discussion, page 39, and Table XXVIII of the Appendix.

|| Hop Report of Joh. Barth & Sohn, Nuremberg, Bavaria, dated August 6, 1925.

¶ Figure 23, page 51.

\*\* See Hop Report of Joh. Barth & Sohn, August, 1925, page 8.

recent years, come very largely from Czechoslovakia and Germany (see Table XXVI of the Appendix). Shipments from these two countries account for more than nine-tenths of all hops imported into the United States.

**HOPS: TOTAL UNITED STATES EXPORTS TO UNITED KINGDOM, CONTINENTAL EUROPE AND CANADA, 1910-1930**

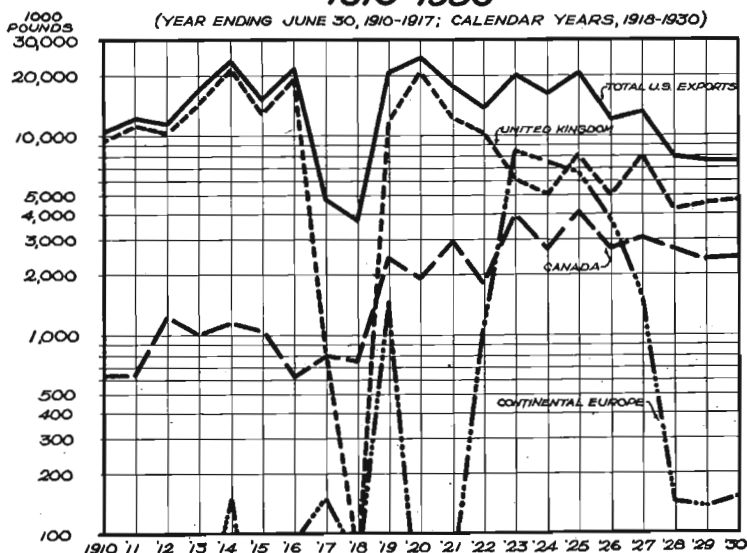


Figure 16.

**PERCENTAGE DISTRIBUTION OF UNITED STATES HOP EXPORTS TO LEADING COUNTRIES, 1910-1930**

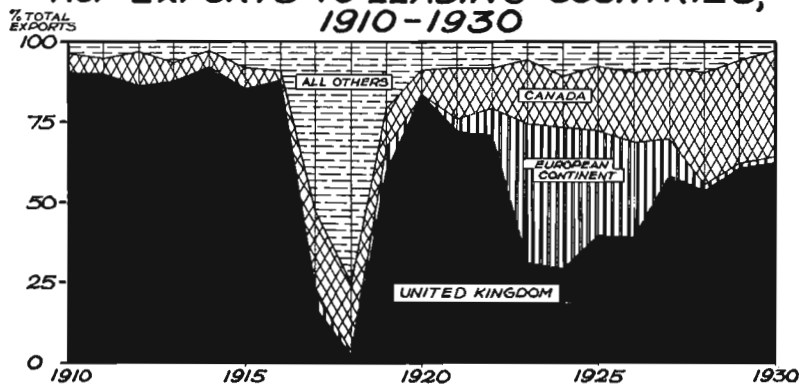


Figure 17.

## INTERNATIONAL TRADE IN HOPS

Something of the competitive position of the United States in the international hop trade is indicated in Figure 18, and Table XXVII (Appendix), which show the comparative importance of leading countries in world trade.\* As the figure shows, Czechoslovakia, United States, and Yugoslavia are now the outstanding hop-exporting nations of the world. In the five-year period, 1925-1929, Czechoslovakia exported, on an average, nearly 16 million pounds of hops, while the United States average was approximately 12½ million, and Yugoslavia, 9½ million pounds. Imports into these countries, on the other hand, were unimportant during this period. France, which ranked fourth, exported more than 5½ million pounds, but imported nearly 4½ millions. Following France in their consecutive order of domestic exports are the United Kingdom,† Poland, Germany, Belgium, Australia, and New Zealand, and miscellaneous countries. Excepting Poland and Australia, all of the countries below France showed imports considerably in excess of exports in 1925-1929.

**HOPS: INTERNATIONAL TRADE, PRINCIPAL EXPORTING  
AND IMPORTING COUNTRIES, AVERAGE 1909-13 & 1925-29**

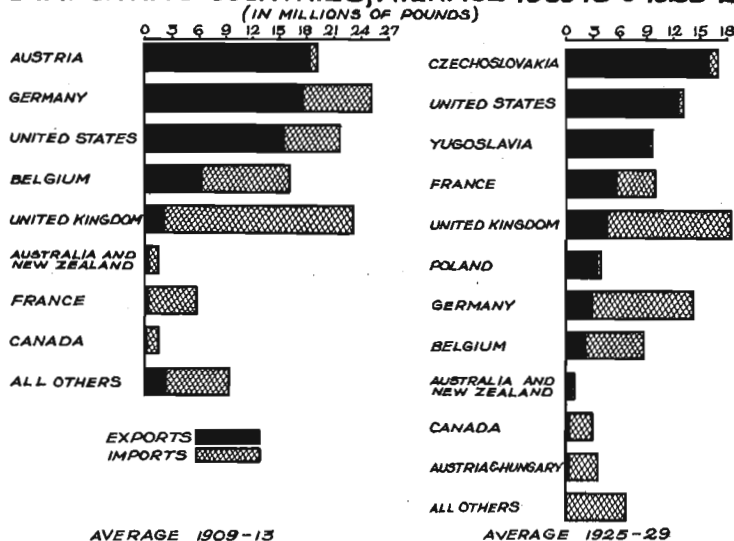


Figure 18.

Abnormal conditions prevailed during the period 1920-1924. In point of actual exports the United States, for several years, exceeded all other nations, averaging more than 19 million pounds, while Czechoslovakia, its nearest rival, exported a little more than 11½ million pounds (Table XXVII, Appendix). With production abroad regaining so rapidly after 1924, however, the natural tendency was for United States exports to become curtailed.

\* General Note: The exports given are domestic exports. While there are some inevitable omissions, on the other hand, there are some duplications also, owing to reshipments that do not appear as such in official reports. The imports shown are for consumption in so far as it is possible to give them. See also footnote of Table XXVII of the Appendix.

† Including also Irish Free State, 1925-1929.

By way of comparison with pre-war years, it is observed that Austria-Hungary led all other countries in volume of hop exports in the period 1909-1913, with an average of more than 18 million pounds. Germany was a close second, averaging  $17\frac{1}{2}$  million pounds, and the United States, third, with  $15\frac{1}{2}$  million pounds. In the other countries shown, imports were greatly in excess of exports.

The changing of international boundary lines in Europe as a result of the War included many of the areas where hops were grown. Thus Czechoslovakia and Yugoslavia are now leading exporting countries, while Austria and Hungary must import hops. France, which formerly produced less than domestic requirements, in recent years has produced a surplus of this commodity in the provinces of Alsace and Lorraine.\* Germany, on the other hand, has found it necessary to import more hops than it has exported.

From the standpoint of world totals, international trade in hops has not yet reached pre-war levels. As shown in Table XXVII (Appendix), exports in twenty-five countries of the world averaged almost 63 million pounds in 1909-1913, as compared to 58 million pounds in 1925-1929. Even this latter figure is larger than it would have been had the international boundary lines remained the same as they were before the War.†

#### IMPORTS INTO CANADA AND THE UNITED KINGDOM, BY COUNTRIES

Since Canada and the United Kingdom are the outstanding export markets for United States hops, it is of interest to observe the trends in imports into those countries and to determine the extent of competition represented by the product of other countries.

**Canada.** Figure 19 shows that Canadian imports for consumption‡ have been coming more and more from European countries, and that the use of United States hops has been declining relative to other countries. In 1921-22, for example, 96 percent of all hops entered into Canada for consumption came from the United States, while by 1930-31 this figure had declined to 37 percent. The increasing relative importance of Germany, Czechoslovakia, and the United Kingdom, on the other hand, is readily apparent from the figure. Changes in tariff rate structure and greatly increased production in European countries no doubt account in large part for this shift of recent years.§ As Table XXVIII (Appendix) shows, total imports for consumption into Canada have been maintained practically on the same level since 1921-22.

\* Table XXVII shows, however, that in 1928-29, French imports somewhat exceeded exports.

† For example, exports of British hops to the Irish Free State in 1925-1929 would not appear as such in 1909-1913.

‡ For data upon which Figure 19 is based see Tables XXVIII and XXIX of the Appendix. Canadian imports for consumption, originating in the United States, average smaller than the figures on exports from the United States to Canada. As has already been mentioned, this is evidently due to the fact that considerable quantities of United States hops have been shipped intransit through Canada to foreign countries being destined primarily for Great Britain. Such shipments do not appear in the import or export trade of Canada. The ultimate destination of United States exports is recorded only when stated on the export declaration.

§ Tariff rates effective in Canada since September 17, 1930, as follows:

British Preferential Tariff	8c per pound.
Intermediate Tariff	12c per pound.
General Tariff	14c per pound.

Prior to the above date, the rates were 4c, 6c, and 7c per pound respectively. The general tariff rate applies to importations from the United States. (Data from the Department of National Revenue Customs Division, Ottawa.) It is also known to be a fact that many German brew-masters in Canada are partial to the use of Continental European hops, particularly when they can get them at so little difference in price over the Canadian or the United States product.

# **HOPS: PERCENTAGE DISTRIBUTION OF CANADIAN IMPORTS FOR CONSUMPTION BY COUNTRIES OF ORIGIN, 1916-1931** (YEARS ENDING MARCH 31)

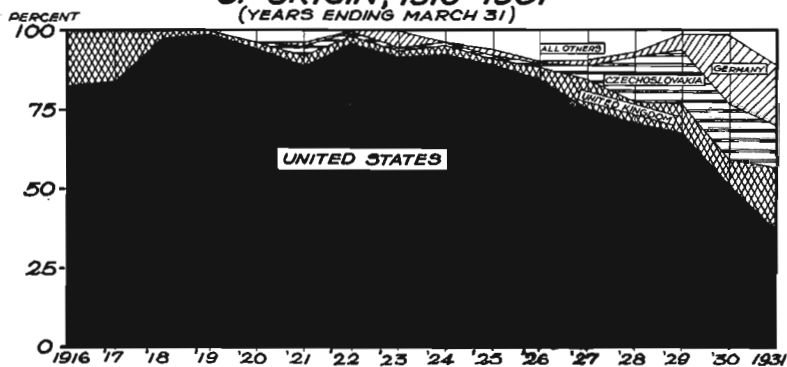


Figure 19.

TABLE XI. HOPS: IMPORTS INTO THE UNITED KINGDOM AND IRISH FREE STATE FROM THE UNITED STATES AND OTHER COUNTRIES, 1915-1930.\*

Year ending December 31	United States	All others†	Total	Percentages of total		
				United States	All others	Total
	Thousands of pounds	Thousands of pounds	Thousands of pounds	Percent	Percent	Percent
1915.....	15,101	7,337	22,438	67	33	100
1916.....	12,039	4,583	16,622	72	28	100
1917.....	138	879	1,017	14	86	100
1918.....	2	4	6	33	67	100
1919.....	9,341	7,958	17,299	54	46	100
1920.....	19,121	32,360	51,471	37	63	100
1921.....	14,684	9,970	24,654	60	40	100
1922.....	12,998	1,602	14,600	89	11	100
1923.....	191	1,315	1,506	13	87	100
1924‡	10,786	3,126	13,912	78	22	100
1925‡	10,091	3,229	13,320	76	24	100
1926‡	7,359	1,057	8,416	87	13	100
1927‡	10,480	4,353	14,833	71	29	100
1928‡	6,726	5,666	12,392	54	46	100
1929‡	6,424	5,335	11,759	55	45	100
1930‡	5,067	3,887	8,954	57	43	100
Average, 1919-1924.....	11,187	9,387	20,574	55	45	100
Average, 1925-1930.....	7,691	3,921	11,612	66	34	100

\* Sources of data: For the United Kingdom: 1915-1924, from U. S. Department of Agriculture Bureau of Agricultural Economics "Foreign News on Hops", October 17, 1925. Year 1925, "Foreign News on Hops", July 9, 1927, and U. S. Department of Agriculture Yearbook 1928, p. 870 on total imports figure for 1925; for years 1926-1930, from the office of Agricultural Attache, Embassy of the United States in London, England. For Irish Free State—Statistics obtained by correspondence with Director of Statistics, Department of Industry and Commerce, Dublin, Ireland.

† Does not include imports from Great Britain into Irish Free State, which were as follows:  
 1924—5,085,000 pounds      1926—3,149,000 pounds      1929—1,474,000 pounds  
 1925—3,680,000 pounds      1927—1,883,000 pounds      1930—2,426,000 pounds  
 1928—2,327,000 pounds

‡ United Kingdom and Irish Free State. The purpose of combining the statistics of these countries in the foregoing manner is to make the figures from 1924 onward directly comparable with the data prior to 1924. Information is not at hand to determine whether Irish Free State was included in United Kingdom imports in 1923.

**United Kingdom.** As has already been indicated, Great Britain is the most important consumer of our exportable surplus of hops. From Table XI it is observed that imports into the United Kingdom\* have declined appreciably during the past few years. Imports reached excessively high levels in 1919-1921, but were drastically reduced in 1922-23 through the activities of the Hop Controller.† In 1925, a duty was placed on importation of foreign hops into Great Britain amounting to more than 17c per pound at par of exchange, effective in the fall of 1925.‡ British importations of hops from the United States and other countries decreased greatly in the year following the imposition of this duty. Large stocks on hand in Great Britain also contributed to this decline. A substantial recovery of imports is noted in 1927, but thereafter a continual decline took place through 1930, when less than 9 million pounds were imported into the United Kingdom and Irish Free State.

According to the data presented in Table XI, the United States was credited with 66 percent of all hop importations into the United Kingdom and Irish Free State during 1925-1930, in comparison with 55 percent for 1919-1924.§ These figures, however, have reference only to countries from whence the British importations were consigned and are therefore not entirely reliable for showing the countries of origin of these hops. As has already been pointed out, considerable quantities of United States hops have been shipped through Canada that later are destined for British markets and it appears that some of these shipments have been recorded in the British figures as importations from Canada.|| Similarly, a part of the shipments from United States to Belgium during 1923-1926 were later imported into England.¶ It is probable, therefore, that the percentages shown in Table XI are too low to reflect the actual quantity of British hop importations originating in the United States, although data are lacking to show this in any concrete way. At all events, the percentage of British importations coming from the United States has been well sustained in recent years, even though a decline in actual quantity is registered.

### TRENDS OF HOP CONSUMPTION

Information on year-to-year carryover and consumption of hops in the United States during recent years is lacking. About the only thing that can be presented along this line is the quantity of hops retained and received for consumption, which in a single year might be quite different from the actual quantity of hops consumed, owing to variations in carryover for which no

\* For convenience, the United Kingdom and Irish Free State are here considered together. This renders the data for recent years more comparable with figures prior to the separation of the two countries.

† Control of hops which began in 1917 with the Hops (Restriction) Order was finally enacted for a period of five years from 1920 by the Ministry of Food (Continuance) Act, 1920. The control involved the prohibition of imports of hops, except under license from the Hop Controller.

‡ A duty of four pounds sterling per cwt. of 112 lbs. on imported hops, with a preference of one-third on Dominion hops, was effected. This tariff was imposed for four years in order to tide the hop industry over a difficult period at the end of Hop Control, and in 1929 the duty was reimposed for a further like period.

§ Importations of British hops into Irish Free State are not included in these statistics.

|| By comparing Canadian exports with imports into United Kingdom from Canada over a period of years, the evidence seems to point in this direction. For example, in the period 1919-1924, imports of hops into Great Britain from Canada averaged 1,664,000 pounds, whereas domestic exports from Canada averaged only 402,000 pounds in the same period. A similar situation existed during the years 1926-1929 when an average of 662,000 pounds of hops entered the United Kingdom from Canada, while on the average only 421,000 pounds of domestic hops were shipped from Canada. It is not to be expected that these figures will check in any one year, but an average of several years should check approximately, at least.

¶ See discussion on page 36.

data can be obtained. Table XII summarizes, by five-year periods since 1880, the national production and domestic exports and imports for consumption. The figures on quantity of hops consumed by brewers (Column X of Table XII) afforded a good index to the amount of hops consumed prior to prohibition, but from 1919 onward the data have reference only to the use of hops in

TABLE XII. HOPS: PRODUCTION, EXPORTS, IMPORTS, QUANTITY RETAINED FOR CONSUMPTION, AND CONSUMPTION BY BREWERS, UNITED STATES, 1880-1929.

Year beginning July 1	Pro- duction	Domestic exports		Total im- ports	For- eign ex- ports	Imports for consumption		Retained and received for consumption			Con- sumed by brew- ers
		Quan- tity	Per- cent- age of U. S. pro- duction III			Quan- tity	Per- cent- age of figures in Col- umn VII	Quan- tity	Per capita	Per- cent- age of U. S. pro- duction IX	
I	II	III	IV	V	VI	VII	VIII	IX	X		
	Thou- sands of pounds	Thou- sands of pounds	Percent	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds	Percent	Thou- sands of pounds	Pounds	Percent	Thou- sands of pounds
Average—											
1880-1884.	31,660	8,649	27	1,184	62	1,122	4.6	24,133	.46	76	
1885-1889.	34,594	8,170	24	7,502	319	7,182	21.4	33,607	.57	97	
1890-1894.	44,307	13,541	31	2,636	122	2,514	7.6	33,280	.51	75	
1895-1899.	44,391	15,828	36	2,415	37	2,378	7.7	30,941	.43	70	
1900-1904.	46,844	11,864	25	3,704	33	3,671	9.5	38,651	.49	83	38,654
1905-1909.	51,904	14,759	28	7,081	35	7,046	15.9	44,191	.51	85	42,602
1910-1914.	52,198	16,672	32	7,413	27	7,386	17.2	42,912	.45	82	42,914
1915-1919.	36,502	13,805	38	746	61	685	2.9	23,382*	.23	64	26,650
1919.	29,346	30,780	105†	2,696	104	2,592		1,158			6,441
1920.	34,280	22,206	65	4,808	828	3,980		16,054	.15	47	5,989
1921.	29,340	13,522	67	893	488	405		10,223	.09	35	4,453
1922.	27,744	13,497	49	1,295	198	1,097		15,344	.14	55	4,556
1923.	19,751	20,461	104†	761	133	628		—82			3,815
1924.	27,670	16,122	58	439	54	385	3.2	11,933	.10	43	3,256
1925.	28,573	14,998	52	581	175	406	2.9	13,981	.12	49	3,426
1926.	31,522	13,369	42	470	37	433	2.3	18,586	.16	59	3,149
1927.	30,658	11,812	39	753	28	725	3.7	19,571	.16	64	3,071
1928.	32,944	8,836	27	650	11	639	2.6	24,747	.21	75	2,734
1929.	33,220	6,792	20	911	34	877	3.2	27,305	.23	82	2,627
Average—											
1920-1924.	27,757	18,362	66	1,639	340	1,299	12.1	10,694	.10	39	4,414
1925-1929.	31,383	11,161	36	673	57	616	3.0	20,838	.18	66	3,001

I. Data for years 1880-1888 from compilation of E. Clemens Horst Co., San Francisco, entitled "World's Production Hops and Beer, 1880 to 1913, Inc." (as obtained from the U. S. Bureau of Agricultural Economics Library). For years 1889-1898, from U. S. Bureau of Statistics Bulletin No. 50; for 1899-1904, figures taken from U. S. Bureau of Statistics Circular 35 entitled "Hop Crop of the United States, 1790-1911". For sources of information from 1905 onward, see footnote, Table XXII.

II. Information for years 1880 through 1905 was taken from U. S. Bureau of Statistics Bulletin No. 50; 1906 through 1915 from "A Compendium of Hop Statistics", compiled by Wm. A. Schoenfeld, John Marshall, Jr., Federal Farm Board, in collaboration with Paul C. Newman, Federal Agricultural Statistician, Portland; year 1929 from the monthly summaries of foreign commerce of the United States, issued by the Bureau of Foreign and Domestic Commerce.

III. Figures in Column II as a percentage of the figures in Column I.

IV and V. Information from same sources as in II.

VI. Total imports (Column IV) minus foreign exports (Column V).

VII. Production (Column I) minus domestic exports (Column II) plus imports for consumption (Column VI).

VIII. Column VII converted to a per-capita basis, using Continental United States population for the corresponding years.

IX. Column VII as a percentage of Column I.

X. These data were obtained from same sources as listed under II, with the exception of years 1926 through 1930, which were obtained by special correspondence with the U. S. Department of Justice, Bureau of Prohibition, Washington, D. C. Figures from 1919 onward represent the quantity of hops used in the manufacture of cereal beverages.

\* By comparing this average with the corresponding figure in Column X, the conclusion is drawn that the United States hop production in 1915-1919 was underestimated.

† This situation is undoubtedly due to large carry-over from previous years.

the manufacture of cereal beverages. The data on amount of hops retained and received for consumption (Column VII of Table XII), however, when averaged by five-year periods, should at least give a fair indication of what the long-time trends in national hop consumption have been.

It is observed that there was a general upward trend in the quantity of hops retained and received for consumption until 1910-1914, the 1880-1884 average being 24 million pounds in comparison with 43 millions in 1910-1914. When expressed on a per-capita basis (Column VIII of Table XII), the trend remained on about the same level over the period, 1880-1914, averaging slightly over or under one-half pound at each five-year period. In the following period, 1915-1919, a sharp decline is registered, and a still further decline to less than 11 million pounds took place in 1920-1924. But in the last period, 1925-1929, a recovery to nearly 21 million pounds is noted, which amounts to about half the 1905-1914 disappearance.

#### COMPARATIVE TRENDS, UNITED STATES, UNITED KINGDOM, AND CANADA

In Figure 20 and Table XIII are summarized the production, domestic exports and imports for consumption for the United States, Great Britain,\* and Canada, averaged by groups of years from 1905-1914 to 1925-1929. The total quantity above the zero line represents the amount of hops available for consumption during the groups of years indicated, while the quantity below the zero line represents exports of domestic hops in the same years. As the accompanying chart indicates, the United States has not been as large a consumer of hops as Great Britain. In 1905-1914 the United States average stood at 43½ million pounds in comparison with 61 millions for the United Kingdom. Likewise, in 1925-1929, the average quantity of hops available for consumption in the United States was 21 million pounds in comparison with

\* The United Kingdom includes also Irish Free State in the present discussion.

#### HOPS: DOMESTIC EXPORTS, RETAINED PRODUCTION AND IMPORTS FOR CONSUMPTION, UNITED STATES, UNITED KINGDOM AND CANADA, 1905-14-1925-29.

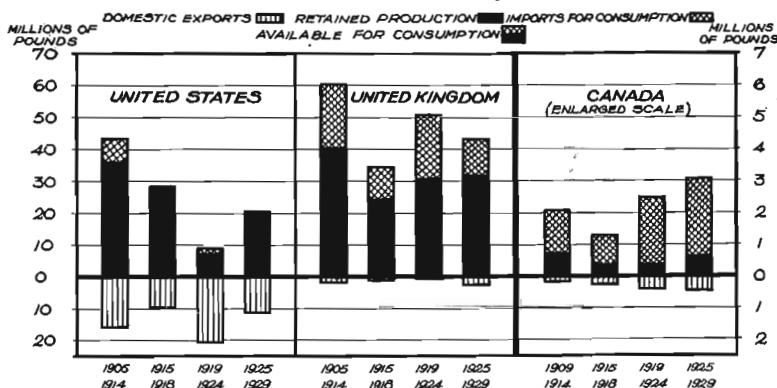


Figure 20.

43½ millions in Great Britain.\* The low mark of consumption in the United States was reached in 1919-1924, while in Great Britain and Canada the war years, 1915-1918, averaged lowest. Apparent consumption in Canada has increased at each period since 1915-1918, but has undergone an appreciable decrease in the United Kingdom since 1919-1924.

Figure 20 shows that imports for consumption into United States and the United Kingdom made up a smaller percentage of total consumption in 1925-1929 than in 1905-1914. Imports for consumption into Great Britain made up one-third of apparent consumption in 1905-1914, but only one-fourth in 1925-1929. United States imports for consumption in 1905-1914 averaged 17 percent of apparent consumption, but in 1925-1929, only 3 percent. Canada, on the other hand, continues to absorb an increasing amount of imports: four-fifths of the 1925-1929 hops available for consumption were made up of

\*For estimated hop consumption in United Kingdom see footnote of Table XIII. The 1905-1914 average estimated consumption was 2 million pounds higher than the quantity available for consumption shown in Figure 20; the 1915-1918 average was nearly 8 million pounds higher, but the 1919-1924 average was more than 6 million pounds less. The consumption estimate for 1925-1929 will check fairly well when allowance is made for consumption in Irish Free State.

TABLE XIII. HOPS: PRODUCTION, DOMESTIC EXPORTS, RETAINED PRODUCTION AND IMPORTS FOR CONSUMPTION, UNITED STATES, UNITED KINGDOM AND CANADA, 1905-1914-1925-1929.†

Country and year	Production	Domestic exports		Retained production		Imports for consumption		Available for consumption
		Quantity	Percentage of production	Quantity	Percentage of figures in Column VIII	Quantity	Percentage of figures in Column VIII	
	I Thousands of pounds	II Thousands of pounds	III Percent	IV Thousands of pounds	V Percent	VI Thousands of pounds	VII Percent	VIII Thousands of pounds
<i>United States—</i>								
Average 1905-1914 . . .	52,051	15,715	30	36,336	83	7,217	17	43,553
Average 1915-1918 . . .	38,291	9,562	25	28,729	99	21	1	28,750
Average 1919-1924 . . .	28,022	20,431	73	7,591	83	1,515	17	9,106
Average 1925-1929 . . .	31,383	11,162	36	20,221	97	616	3	20,837
<i>United Kingdom—</i>								
Average 1905-1914 . . .	42,202	1,728	4	40,474	67	20,318	33	60,792
Average 1915-1918 . . .	25,948	1,091	4	24,857	71	9,920	29	34,777
Average 1919-1924 . . .	31,117	321	1	30,796	60	20,247	40	51,043
Average 1925-1929 . . .	34,565	2,572	7	31,993	74	11,445	26	43,438
<i>Canada—</i>								
Average 1909-1914 . . .	891	160	18	731	35	1,382	65	2,113
Average 1915-1918 . . .	642	276	43	366	28	950	72	1,316
Average 1919-1924 . . .	760	402	53	358	14	2,148	86	2,506
Average 1925-1929 . . .	1,130	485	43	645	21	2,461	79	3,106

II. Exports of British hops to Irish Free State are not included under United Kingdom.

IV. Figures in Column I minus corresponding figures in Column II.

VI. Imports from United Kingdom into Irish Free State not included under United Kingdom.

VIII. Sum of figures in Column IV and Column VI.

Hops consumed by brewers in the United States averaged as follows:

1905-1914—42,758,000 pounds. 1915-1918—31,702,000 pounds.

Estimated consumption of United Kingdom (not including Irish Free State from 1923 onward):

1905-1914—62,782,000 pounds. 1919-1924—44,987,000 pounds.

1915-1918—42,548,000 pounds. 1925-1929—38,552,000 pounds.

† Sources of information: United States figures from same sources as indicated in Table XII. Canada: production data as in Table XIX; data on imports and exports, 1909-1929 from Canada Yearbooks 1913-1915, 1920, 1926, and 1929, as well as sources indicated in Table XXVIII. United Kingdom and Irish Free State: see Tables XI and XIX. Years 1915 onward, from correspondence with A. E. Foley, Agricultural Attache, Embassy of the United States in London, England. See also U. S. Department of Agriculture "Foreign News on Hops", October 17, 1925.

imports, while in 1909-1914 about two-thirds was represented by imports. In both Canada and the United Kingdom there has been a slight tendency to increase domestic exports in recent years.

### RATE OF HOP CONSUMPTION

World hop consumption has been influenced primarily by two factors; namely, the quantity of beer brewed, and rate of hop consumption per unit quantity of beer brewed.\* As Table XXX (Appendix) shows, the world output of beer has undergone great changes over the past several decades. Increasing from an average of 126 million barrels in 1880-1884 to an average of 250 millions in 1910-1913, the output of beer then dropped very materially during the War, recovering only partly since then. The 1924-25 to 1928-29 average was nearly 100 million barrels less than the pre-war output, but was some 36 million barrels more than the 1919-20 to 1923-24 average. The generally unfavorable economic conditions in Europe, coupled with prohibition in America are no doubt primarily responsible for this great decline. Continental European countries and the United Kingdom† are now credited with more than 85 percent of the World beer output, whereas in 1910-1913 those countries brewed a little more than 70 percent (Table XXX, Appendix).

\* It is true that small amounts of hops are used for medicinal and other purposes, but clearly the outstanding use of hops is in the manufacture of beer. Since the advent of prohibition in America, large amounts of hops have been consumed in the manufacture of malt sirup and cereal beverages.

† Including also Irish Free State.

TABLE XIV. APPROXIMATE RATE OF HOP CONSUMPTION IN EUROPE, UNITED STATES AND THE WORLD, FOR EACH BARREL OF BEER BREWED THEREIN, 1880-1884 TO 1926-1930.  
(In pounds per 31-gallon barrel)

Years averaged	European Continent I	United Kingdom II	Total Europe III	United States IV	World V
	Pounds	Pounds	Pounds	Pounds	Pounds
Average 1880-1884	.4	.4	.4	1.38	1.32
Average 1885-1889	.4	1.90	.4	1.39	1.39
Average 1890-1894	.82	1.54	1.08	1.02	1.10
Average 1895-1899	.81	1.54	1.06	.84	1.04
Average 1900-1904	.63	1.27	.84	.84	.87
Average 1905-1909	.68	1.33	.88	.77	.89
Average 1910-1914	.62	1.29	.82	.67	.78
Average 1912-13 to 1914-15	.60	1.27	.79	.64	.75
Average 1921-22 to 1925-26	.59	1.42	.86	.4	.89
Average 1926-27 to 1930-31	.61	1.37	.78	.4	.86

I. For the years 1880-1884 to 1910-1914, these averages are made up from data of Austria-Hungary, Germany, France, and Belgium. Hops retained and received for consumption divided by the quantity of beer brewed in the respective years. See U. S. Bureau of Statistics Bulletin No. 50 for data on imports and exports for these countries 1880-1904. 1905-1914 data on imports and exports from same sources as Table XXVII on International Trade. Production data and beer brewed from same sources as in Tables XIX and XXX. Data, 1912-13 to 1914-15 onward were taken from annual hop reports of Joh. Barth & Sohn. Originally expressed as dose of hops in  $\frac{1}{2}$  kilo per hectolitre.

II. Data on quantity of hops retained and received for consumption, and beer brewed, 1885-1889 to 1900-1904 from U. S. Bureau of Statistics Bulletin No. 50. Data, 1905-1914, same sources as in Table XIII. Estimated hop consumption by brewers used, 1905-1909 to 1910-1914. The averages 1912-13 to 1914-15 onward were obtained from same source as in I. These data check closely with computations arrived at from Table XIII for corresponding years. The rate for 1905-1909 and 1910-1914 was computed from data as recorded in the Statistical Abstracts for the United Kingdom.

III. Great Britain and Continental Europe.

IV. For sources of information, see Table XII. The 1912-13 to 1914-15 average from annual reports of Joh. Barth & Sohn.

V. For 1880-1914 production data in Table XIX divided by beer brewed as in Table XXX, for corresponding years. 1912-13 to 1914-15 onward, same sources as in I.

.4 Data not at hand or not available to make these computations.

Complete data on the actual quantity of hops consumed in various countries of the world are not available; hence actual figures on rates of consumption cannot be presented. The approximations shown in Table XIV were arrived at by dividing the amount of hops available for consumption in each five-year period by the beer output for corresponding countries and years.\* The last three averages of Table XIV are based on estimates as recorded in the annual hop reports of Joh. Barth & Sohn, Nuremberg, Bavaria.

Viewing the trend over the past several decades, it appears that the rate of the use of hops for the world as a whole declined appreciably from 1880-1884 to 1900-1904, but after 1900 there apparently has been no significant change in this figure. The 1900-1904 average of .87 is virtually the same as the rate since 1920. The diminution in the use of hops as compared to years prior to 1900 is, according to those in the trade, at least partly explained by the elimination of waste, which was very prevalent under the older brewing methods.† Added to this has been the inclination toward amalgamation by various brewing concerns whereby savings have been aimed at and, presumably, obtained.

As indicated in Table XIV, the rate in the use of hops in the United Kingdom greatly exceeds that of Continental Europe or the world at large. An appreciable decline in this rate is observed to have occurred from 1885-1889 to the beginning of the twentieth century, with apparently no important change of rate thereafter. A small increase seems to have occurred in 1920-1924 as compared to the preceding decade, but a slight decrease has been registered during the past few years.‡

Considering Continental European countries, the rate in hop consumption has seemingly changed but little since 1900; the tendency, if anything, has been toward a slight decrease. The United States, on the other hand, showed a continual decline over the period 1880-1884 to 1910-1914, the latter rate being only slightly higher than that of Continental Europe.

## PRICES OF HOPS

A study of prices received for the product is naturally of paramount importance in analyzing the economic status of any industry. As has already been mentioned, there are few agricultural products that undergo such wide fluctuations in price from year to year as hops. Wide differences also exist between the best and poorest grades of hops, and between hops of different growths. In the following pages these fluctuations and differences are presented and discussed.

### PRICES PAID OREGON GROWERS FOR HOPS

In Figure 21 and Table XV are shown the trends in actual and adjusted prices paid Oregon growers for hops from 1890 to 1930.§ Since these prices

\* For world figures the world production of hops was divided by the quantity of beer brewed in corresponding years. Averages from 1912-1914 onward, from estimates of Joh. Barth & Sohn. See also footnote of Table XIV.

† The use of cold storage has no doubt helped to reduce losses also.

‡ Computations made from data on beer brewed and hops used in brewing as recorded in the Statistical Abstract for the United Kingdom (Nos. 51, 64, 72, 73, and 74) are as follows: Average 1905-1909, 1.33 pounds hops per U. S. barrel; Average 1910-1914, 1.29 pounds; Average 1915-1919, 1.39 pounds; Average 1920-1924, 1.43 pounds; Average 1925-1929, 1.38 pounds. In the opinion of certain English brewers there has been a continued diminution in the use of hops in England, rather than an increase. The statistical evidence presented here and in Table XIV indicates that this was true from 1885-1889 to 1900-1904 but not from 1905-1914 to post-war years. As mentioned above, however, a decreasing tendency is noted the past few years as compared to 1920-1924. The increased beer duty in England has necessitated the manufacture of lighter beers requiring fewer hops.

§ Prices shown in Figure 21 are weighted average prices as taken from Columns V and VII of Table XV.

extend over a long period of years it becomes necessary to consider also changes in the general price level along with the actual price movements. For purposes of removing the effects of changes in the general level of prices the United States Bureau of Labor Statistics All-Commodity Wholesale Price Index\* is used in the present discussion.

Viewed from the standpoint of actual prices paid growers, Oregon hops underwent a general upward trend over the period 1895 to 1920, but since 1920 the trend is observed to have been downward. When such prices are adjusted for changes in the general price level, however, it will be observed that there has been a downward tendency ever since 1909-1913. In fact, the adjusted price during the ten years 1921-1930 averaged lower than in any similar period of the past four decades. This lower level as compared to pre-war years may, no doubt, be attributed in large part to the decreased consumption of hops both at home and abroad.†

The accompanying chart shows that Oregon hop prices have undergone many violent and quite irregular fluctuations, although there seems to be some evidence that cycles are present also. Thus a distinct downward tendency of adjusted prices is noted in the period 1890 to 1895, which in turn was followed by a recovery that reached its height in 1904. A repetition of declining prices took place from 1904 to 1907, followed by a rapid rise to 1911 and a subsequent recession to 1916. Rapidly increasing prices are once more in evidence from 1916 to 1919, with equally rapid declines until 1922. There is less evidence of cyclical movement after 1922, although from 1926 to 1929 prices underwent substantial declines. A fair improvement is noted in the crop year 1930-31 as compared to 1929-30.

\* Since no index is available to represent adequately the prices paid by Oregon hop growers for commodities they must purchase, it is not possible in this discussion to express price changes in terms of grower purchasing power. The use of the foregoing Federal index results in a price that would have prevailed, as nearly as can be calculated, had the value of money remained stationary, rather than measuring specifically changes in the per-unit worth to the grower of the commodity under consideration.

† See discussion on pages 41 to 44.

### HOPS: ACTUAL AND ADJUSTED PRICES PAID GROWERS IN OREGON, 1890-1930

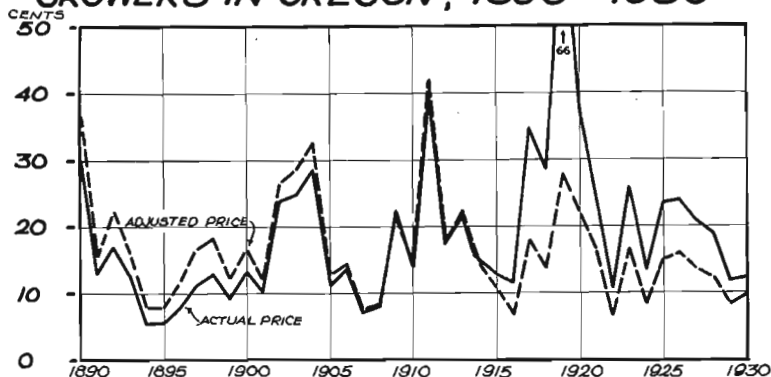


Figure 21.

TABLE XV. HOPS: ACTUAL AND ADJUSTED AVERAGE PRICES PAID GROWERS  
IN OREGON, 1890-1930.\*  
(Cents per pound)

Year	Actual average price					All-commodity index (Crop year)	Adjusted price
	Fall	Winter	Spring	Yearly average			
				I	II	III	Simple IV
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>		<i>Cents</i>
1890.....	33.7	27.2	23.2	28.0	31.7	82	38.6
1891.....	12.2	16.5	14.7	14.5	13.1	85	15.4
1892.....	17.5	16.3	14.0	15.9	17.0	76	22.4
1893.....	13.0	11.3	11.8	12.0	12.6	78	16.1
1894.....	5.8	5.0	4.3	5.0	5.5	70	7.9
1895.....	6.0	5.3	2.8	4.7	5.6	71	7.9
1896.....	7.5	9.8	7.8	8.4	7.9	68	11.6
1897.....	11.8	9.8	9.7	10.4	11.3	68	16.6
1898.....	12.3	16.7	13.0	14.0	13.0	71	18.3
1899.....	10.2	8.2	5.3	7.9	9.4	76	12.4
1900.....	13.5	13.0	13.0	13.2	13.4	80	16.8
1901.....	9.8	10.7	13.3	11.3	10.3	84	12.3
1902.....	25.0	23.0	16.0	21.3	23.8	89	26.7
1903.....	27.0	20.0	16.0	21.0	24.9	87	28.6
1904.....	31.0	24.0	18.0	24.3	28.7	88	32.6
1905.....	12.0	9.0	10.0	10.3	11.4	89	12.8
1906.....	16.0	8.0	6.0	10.0	13.8	95	14.5
1907.....	8.0	5.5	4.0	5.8	7.2	93	7.7
1908.....	8.0	8.0	10.0	8.7	8.2	96	8.5
1909.....	24.0	20.0	16.0	20.0	22.6	104	21.7
1910.....	12.0	19.0	20.0	17.0	13.9	95	14.6
1911.....	45.0	37.0	25.0	35.7	41.8	99	42.2
1912.....	19.0	16.0	16.0	17.0	18.3	102	17.9
1913.....	25.0	17.0	15.0	19.0	22.8	101	22.6
1914.....	16.0	12.0	11.0	13.0	14.9	101	14.6
1915.....	13.5	11.0	11.0	11.8	12.9	117	11.0
1916.....	12.0	8.0	14.0	11.3	11.6	165	7.0
1917.....	42.0	16.0	10.5	22.8	35.0	192	18.2
1918.....	26.0	38.0	35.0	33.0	28.7	207	13.9
1919.....	58.0	82.5	100.0	80.2	65.9	235	28.0
1920.....	44.0	22.0	14.0	26.7	37.7	171	22.0
1921.....	28.0	14.0	14.0	18.7	24.5	147	16.7
1922.....	11.0	11.0	9.0	10.3	10.8	158	6.8
1923.....	27.0	23.0	24.0	24.7	26.1	153	17.1
1924.....	14.0	13.0	12.0	13.0	13.7	160	8.6
1925.....	24.0	21.0	25.0	23.3	23.7	157	15.1
1926.....	25.0	21.0	23.0	23.0	24.2	149	16.2
1927.....	21.0	21.0	20.0	20.7	20.9	152	13.8
1928.....	20.0	18.0	13.0	17.0	19.0	152	12.5
1929.....	13.0	10.0	7.0	10.0	12.0	142	8.5
1930†.....	11.5	14.9	15.5‡	14.0	12.4	123§	10.0
Average 1890-1909.....	15.2	13.5	11.4	13.3	14.6	.....	.....
Average 1910-1930.....	24.2	21.2	20.6	22.0	23.4	.....	.....
Average 1890-1930.....	19.8	17.4	16.1	17.8	19.0	.....	.....

I. Average of months September, October, and November.

II. Average of months December, January, and February.

III. Average of months March, April, and May.

IV. Simple average of fall, winter, and spring months.

V. Weighted on the basis of 75 percent of the season's sales being made by growers in the fall months, 15 percent during the winter months, and 10 percent during the spring months. This seasonal percentage movement out of growers' hands will of course vary from year to year, but the above approximation is believed to be about the average.

VI. U. S. Bureau of Labor Statistics all-commodity wholesale price index converted to 1910-1914 base of 100 percent. Index for the calendar year was used from 1890 to 1899; crop year index, September to August, was used from 1900 to 1930. Data were obtained from the U. S. Bureau of Agricultural Economics publication "Index Numbers of Farm Prices", June, 1927. Later figures from "The Agricultural Situation."

VII. Column V divided by Column VI.

\* Statistics obtained from confidential records of Oregon hop dealers.

† Data from the office of the Federal Agricultural Statistician, Portland.

‡ Tentative.

§ September-April average.

These variations in prices have, no doubt, been brought about to a considerable extent by alternating periods of high and low production, although it is difficult to show this in any concrete way, owing to the many complicating factors that have affected hop consumption in the past, coupled with changes in the amount of carry-over from year to year, of which no record is available. Oregon prices have been influenced by both national and world production. During the periods 1893-1899 and 1905-1908, when prices were low, the world crop averaged appreciably larger than in the two periods, 1900-1904 and 1909-1913, when prices were high.\*

With the beginning of the World War, conditions in the hop industry were materially altered. Both production and consumption of hops fell off enormously.

\*See Figure 3, and Table XIX (Appendix). World hop production in the period 1893-1899 averaged about 202 million pounds; 1900-1904, 185 millions; 1905-1908, 226 millions; and 1909-1913, 175 millions. Production in individual years fluctuated widely, however.

### HOPS: PRICES PAID OREGON GROWERS, WHOLESALE QUOTATIONS AT PRIMARY MARKETS, AND EXPORTED AVERAGE PRICE, 1890 - 1930

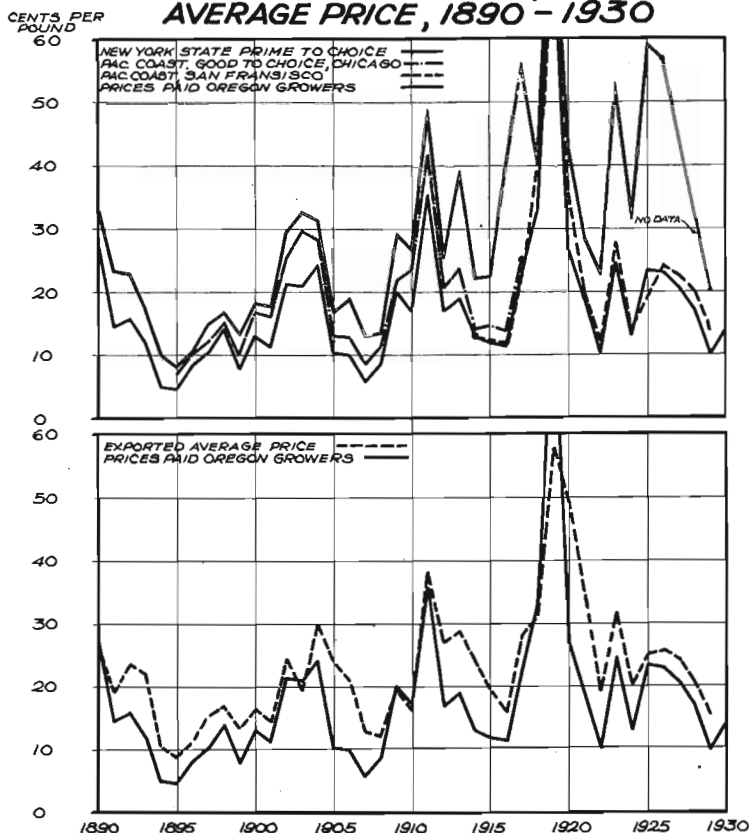


Figure 22.

ously after 1914, but prices showed no substantial improvement until 1918. With the cessation of hostilities the markets abroad were thrown open to United States hops, and prices rose to very high levels, despite the greatly curtailed consumption in this country as a result of prohibition. The depressed economic conditions in Europe, however, were soon reflected in lower hop prices. World consumption of hops has not yet attained the former levels, so that a large crop at the present time would have been inadequate to supply pre-war demands. Hence, despite the fact that world production is still on lower levels, the crops of recent years have been in excess of consumption, thus causing a lowering of prices. The improvement in price that has taken place during 1930-1931 is largely a result of a better balance between production and consumption in the United States.

### COMPARATIVE PRICES, OREGON AND OUTSIDE MARKETS

**Domestic markets.** Figure 22 shows that prices paid Oregon growers have been approximately in line with wholesale quotations of Pacific Coast hops at Chicago and San Francisco for the past 3 or 4 decades.\* The fluctuations throughout the series have been very similar, with Oregon prices naturally averaging somewhat under the wholesale quotations. Only a few exceptions are noted in which the Oregon price actually exceeded the San Francisco average. Compared to the exported average price per pound, the similarity of price fluctuations is again apparent, although the correspondence is not quite as close as in the previous comparison.

Prices of New York State hops, while showing fair similarity in year to year changes, have been subject to even more violent fluctuations than have Pacific Coast hops, particularly from 1913 onward. In every year, the New York quotations have averaged above the Chicago or San Francisco prices, the margin, however, varying greatly at different periods. A very wide spread is observed beginning with 1913, but by 1929 this margin was greatly narrowed.† New York State, it will be remembered, has very largely gone out of the hop business,‡ but a number of Eastern brewers who have been accustomed to using New York hops because of their characteristic fine aroma, still absorb what production there is left, and have apparently been willing to pay a substantial premium to obtain them.

**Foreign markets.** As has already been mentioned, a wide variation exists between the prices of different growths of hops, and especially between the crops of different countries. In Figure 23 is shown the comparative price changes of American, English and Bavarian hops, together with the United States average imported price over the period, 1919-1929.§ It will be noted from this figure that while the United States imported price|| has followed somewhat that of the German quotations, a wide divergence is found to exist

\*The data used in Figure 22 were taken from Table XV and Table XXXI (Appendix). No Chicago quotations available after 1917. Data are for crop years, September to August, excepting the exported average price which is for crop years, July to June. Oregon prices here shown are simple averages by crop years, September to May.

†The 1922-1926 average wholesale price of New York State prime to choice hops at New York was 44.5c per pound, in comparison with an average of 26.5c for Pacific Coast prime to choice hops at New York for the same period. In 1929 the price of New York State hops was 19.9c, as compared to 18.9c for Pacific Coast hops, a spread of only 1c in the same market. (Data from same sources as indicated in footnote of Table XXXI, Appendix.)

‡See discussion on page 17.

§Based on Table XXXII (Appendix). The English quotations represent average prices for September to December of each year; the Bavarian (German) quotations, September to May; San Francisco, September to August; U. S. Imported average price crop years, July to June.

||Hops mainly from the Continent of Europe.

between the San Francisco and German prices from 1923 to 1928. The English quotations, on the other hand, have shifted more in harmony with those of San Francisco, although at generally much higher levels. The artificially enhanced prices which were maintained for several years in England through the activities of the Hop Controller and the English Hop Growers, Ltd., were discontinued in 1929, and prices receded to very low levels. Large crops and surplus stocks were responsible for the decline.

**COMPARATIVE PRICES OF ENGLISH, BAVARIAN,  
AND PACIFIC COAST HOPS, AND UNITED STATES  
IMPORTED AVE. PRICE, 1919-1929**

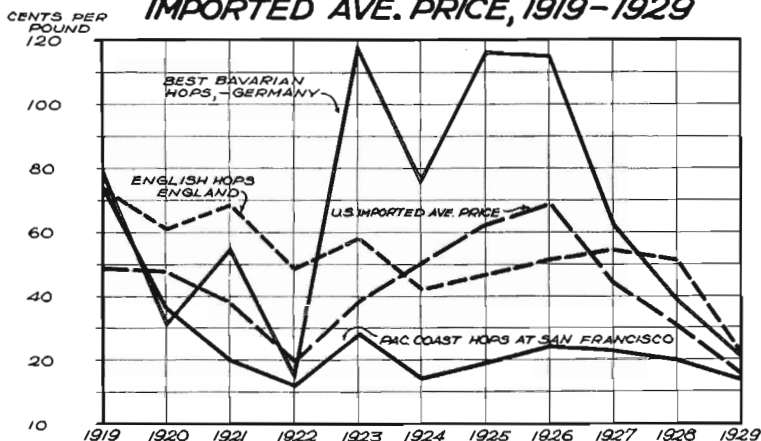


Figure 23.

There are many complicating factors which affect the price of hops in different regions and countries. For example, seedless hops are grown in Germany, making for a lower yield but commanding a higher price in the market. Also, more painstaking methods of harvesting are practiced, so that the percentage of foreign matter in Bavarian hops is much lower than the American product. In the English situation the high tariff, coupled with the artificial price manipulations referred to above, have had a pronounced influence on hop prices during the past decade.

Another factor which prevents prices in different regions from shifting uniformly is the nature of the demand for the product itself. The fact that individual brewers become accustomed to the use of certain growths of hops makes them reluctant to change their formula, and since hops even at a high price constitute but a small fraction of the cost of beer manufacture, brewers when forced to do so will pay extremely high prices to get the particular kind and quality of hops they want, even though there may be an abundance of other sorts at lower prices. On the other hand, a large surplus is almost worthless to the brewer and prices soon drop to ruinous levels as a consequence.

**Price comparisons, Oregon, Washington, and California.** Any advantage which Oregon growers may have over producers in competing states with regard to superior quality of hops produced should be reflected in prices

received for the product. The only data available with which to compare Oregon hop prices with those of Washington and California are the December 1 farm prices of the United States Bureau of Agricultural Economics. While these figures as presented in Table XVI leave much to be desired, they at least give some indication as to the comparative prices obtained in the three states.

Considered from the standpoint of 1925-1930 averages, Oregon hop prices have been higher than those of either California or Washington. December 1 farm prices averaged 20c per pound in Oregon during this period, while in Washington the average was 17.8c and in California, 17.5c. The 1920-1924 average, it will be observed, does not show as wide a spread between these states, while in 1915-1919, both the United States and California prices were higher than the Oregon price.\* Washington prices, on the other hand, have averaged lower over the entire period 1915-1930.

The fact that each individual buyer has his own preference as to the kind of hops he requires, renders any direct comparison of quality of one geographic location with another, both difficult and controversial. Generally speaking, the Oregon hops are considered superior to the average growth of California or Washington, a statement which the foregoing price comparisons seem to substantiate. There are exceptions to this generalization, however, as, for example, the hops of Tampico, Washington, and Sonoma, California, which are considered on a par with the Oregon product. Geographic location within the state of Oregon, on the other hand, is not so much a factor affecting quality as in the case of Washington or California.

\*The higher price in California from 1915 to 1919 may be partly explained by the fact that statewide prohibition was not adopted as soon in California as in Oregon.

TABLE XVI. HOPS: FARM PRICE DECEMBER 1, LEADING PRODUCING STATES AND THE UNITED STATES, 1915-1930.\*

(Cents per pound)

Year	Oregon	Washington	California	United States
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
1915 .....	11.0	11.3	10.5	11.7
1916 .....	10.0	11.5	10.5	12.0
1917 .....	24.0	27.0	31.0	33.3
1918 .....	21.0	15.0	20.0	19.3
1919 .....	80.0	75.0	77.0	77.6
1920 .....	35.0	35.0	35.0	35.7
1921 .....	25.0	20.0	25.0	24.1
1922 .....	9.0	10.0	8.0	8.6
1923 .....	20.0	18.0	18.0	18.8
1924 .....	10.0	10.0	11.0	10.3
1925 .....	23.0	21.0	20.0	21.8
1926 .....	25.0	21.0	21.0	23.1
1927 .....	25.0	22.0	20.0	22.9
1928 .....	20.0	18.0	19.0	19.3
1929 .....	12.0	10.0	11.0	11.4
1930 .....	15.0	15.0	14.0	14.8
Average 1915-1919 .....	29.2	28.0	29.8	30.8
Average 1920-1924 .....	19.8	18.6	19.4	19.5
Average 1925-1930 .....	20.0	17.8	17.5	18.9

\* Sources of data: Years 1915-1929 from "A Compendium of Hop Statistics" by Wm. A. Schoenfeld, and John Marshall, Jr., Federal Farm Board, in collaboration with Paul C. Newman, Federal Agricultural Statistician. Also from December issues of U. S. Department of Agriculture "Monthly Crop Reporter", "Weather, Crops and Markets" and "Crops and Markets". Year 1930 from December issue of "Crops and Markets". Some of these figures can be found in U. S. Department of Agriculture Yearbooks also.

## PRICES OF NEW VERSUS OLD HOPS

In general, hops deteriorate with age. At the end of one year's time hops kept in ordinary storage have already suffered material deterioration, although during the first six months or so, the effect is scarcely noticeable.\* When new hops are available, yearlings as a rule will sell from 3c to 6c per pound below the new crop. For example, during the crop season 1930-31 the following sales of prime to choice Clusters are noted:†

Month	1930 Crop (Range in cents per pound)	1929 Crop (Range in cents per pound)
	<i>Cents</i>	<i>Cents</i>
September.....	10 -12	7-7½
November.....	15 -16	11
December.....	16 -17	10-11
January.....	15½-17	10
April.....	15 -15½	10
May.....	15½-18½	8-11
AVERAGE.....	15¼	9¾

This price margin will vary somewhat with the year. Should the general average of the crop be poor as compared to previous years, the price difference between the new and old crop may be slight, as was the case in 1929. Also, the margin between yearlings and two-year-old hops averages less than the margin between new hops and yearlings. In seasons when the market price has been very low, growers retain considerable of their stocks for a year or longer. It appears from the foregoing that this is the only condition under which long-period storage is justified.

## SEASONAL AVERAGE PRICES

Hops are different from most staple agricultural commodities in their seasonal price behavior. As the data in Figure 24‡ indicate, the seasonal average price of hops over a long period of years has averaged higher in the fall than at any other time of the year. For example, in the period 1910-1930, the price paid Oregon growers during the fall months averaged 24.2c per pound; the winter months, 21.2c, and the spring months, 20.6c. A similar situation existed in 1890-1909, as is shown in Figure 24.

It should be borne in mind, of course, that the foregoing figures represent averages, and not individual years. In 8 out of the 41 years from 1890 to 1930, for example, both the winter and spring price averaged higher than the fall price,§ while in 3 more years the spring price alone averaged higher.|| The crop year 1930-31 has apparently turned out to be one of those years in which the average price has moved upward through the season.

\* Almost no hops are kept in cold storage on the Pacific Coast, although in the East this method of storing hops is quite general. It is claimed by those in the trade that good cold storage preserves hops fairly well for at least a year, and cases are cited where hops stored three years were still in good condition. Certain English brewers even maintain that it is necessary to hold some growths of hops in cold storage a year before they can be used for brewing purposes. When hops are taken out of cold storage they must be used immediately, otherwise they become heated and spoil quickly.

† As recorded in the Hop Market Review, U. S. Department of Agriculture, Bureau of Agricultural Economics, Market News Service, Portland, Oregon, for corresponding months.

‡ Statistics taken from Table XV. The fall months include September, October, and November; the winter months, December, January, and February; the spring months, March, April, and May.

§ Years 1891, 1896, 1898, 1901, 1910, 1918, 1919, and 1930. See also Table XV.

|| Years 1908, 1916, and 1925 in addition to those listed above.

# HOPS: SEASONAL AVERAGE PRICES PAID PRODUCERS IN OREGON, 1890-1930

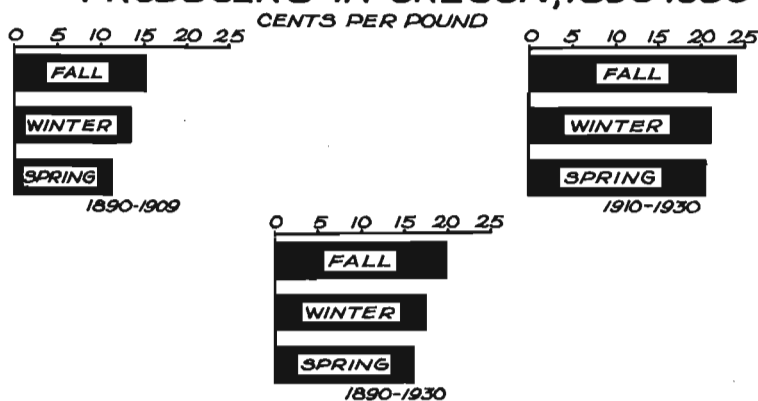


Figure 21.

That the foregoing conclusion with regard to seasonal price movement has held true of outside markets\* as well as in Oregon is indicated in Table XVII, which shows monthly wholesale quotations of hops at New York, averaged over a long series of years. Considering the 1910-1929 average, it is noted that October is the month of highest average, with 46.1c per pound. A continual decline in the average is noted for each month thereafter, reaching its lowest mark of 36c in August. Taking the whole period, 1895-1929, October and November have averaged almost the same, while December and the months following show a regular decline. The September figure is set apart from the rest as it is believed that the quotations for this month include a

\* Correspondence with Joh. Barth & Sohn, hop merchants, Nuremberg, Bavaria, reveals the fact that this same situation holds true in Europe.

TABLE XVII. HOPS: MONTHLY AVERAGE WHOLESALE QUOTATIONS NEW YORK STATE, PRIME TO CHOICE AT NEW YORK, AVERAGED BY CROP YEARS, 1895-1929.<sup>†</sup>  
(Cents per pound)

Month	Average 1895-1909	Average 1910-1929 <sup>‡</sup>	Average 1895-1929 <sup>§</sup>
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
October.....	20.8	46.1	34.6
November.....	21.4	45.0	34.3
December.....	21.1	43.3	33.2
January.....	20.9	41.7	32.2
February.....	20.6	40.6	31.5
March.....	19.7	39.2	30.3
April.....	18.2	39.0	29.5
May.....	17.4	38.2	28.7
June.....	17.2	37.8	28.4
July.....	17.1	37.4	28.2
August.....	17.0	36.0	27.4
September <sup>§</sup> .....	16.5	42.8	30.8

<sup>†</sup> Sources of data: Years 1895-1924 from U. S. Department of Agriculture Yearbooks 1899, 1900, 1903, 1907, 1911, 1913, 1914, 1916, 1918, 1919, 1920, 1921, 1922, 1923, 1924, and 1925. Years 1925-1929 from U. S. Bureau of Agricultural Economics, Division of Statistical and Historical Research.

These statistics are compilations from quotations in the New York Journal of Commerce. Monthly high-low average for 1895-1917; daily quotations to obtain the monthly average, 1918-1929.

<sup>‡</sup> Crop years 1927 and 1928 not included owing to incomplete figures.

<sup>§</sup> It is believed that the September figures represent mixed quotations of both old and new crops.

mixture of both old and new crops, which tends to place it half way between the August and October average.

Why should the seasonal average price of hops over a long period of years be higher in the fall than any other time of the year, when in fact it is normally expected the storage and interest charge to reverse the order? The explanation most generally offered by dealers in the hop trade is the fact that the largest and best part of the crop is usually bought immediately after picking. The theory is that the larger brewers get a better selection of the crop in the fall, and they are willing to pay a reasonable price for this selection. The more concentrated demand in the fall months causes higher prices. Also, since the fall purchases constitute the best part of the crop, the buyers later in the season have to be satisfied with what is left. Thus the "qualities" may advance as the season progresses: A "prime" hop early in the season may be considered "choice" later on when all the really "choice" hops are gone and nothing better can be obtained.

### CONTRACT PRICES PAID GROWERS

The grower contract is used quite extensively in Oregon, from one-third to two-fifths of the state crop being so marketed.† Many growers like the contract on account of the convenience of finance, since dealers advance them money in the spring and at harvest time. It also offers security to the grower in that he knows what he is getting for his crop. Contracts are from 1 to 5 years duration and call for hops "that should be of prime quality, of even color, well and cleanly picked, free from damage by vermin, properly dried and cured, not broken and shall not be of the first year's planting."‡ Dealers aim to extend contracts only to those growers who can be relied upon to deliver the amount and quality of product specified in the contract.

In Table XVIII it is shown that considerable variation exists between spot and contract prices in individual years, but that there is little difference over a period of time. Contract prices for Clusters, for example, were way below the spot prices in 1920, but considerably above in 1922. In both 1929 and 1930, when the cash markets were weak, the contract price naturally averaged higher than the spot prices. The 1920-1930 average for contract Clusters was 21c per pound, as compared to 21.7c in the cash market. This latter figure includes also a small amount of Fuggles,§ so that in reality the spot market for like varieties has averaged practically the same as the contract price in the eleven-year period.||

Table XVIII shows that the 1920-1930 average contract price for Fuggles was 25.3c per pound as against 21c for Clusters, leaving a margin of 4.3c in favor of Fuggles. This margin has narrowed greatly during the past few years, however, owing mainly to the falling-off in trade with the United Kingdom and Canada, mention of which has already been made.¶ Prices in the cash market have, of late, averaged essentially the same for Fuggles as for Clusters.

\* Hops begin to deteriorate with age after several months in storage, but this is not reflected in price until the new crop comes on the market. See also discussion on page 53.

† Based on estimates of Oregon hop dealers.

‡ As taken from uniform hop contract form in use at the present time.

§ About nine-tenths of the Oregon crop is made up of Clusters, and one-tenth of Fuggles, reference to Table VIII shows. Average prices include all varieties.

|| The fact also that advances for production are made to growers holding contracts gives those growers the advantage of not having to borrow funds for production.

¶ See discussion on page 37. Fuggles are grown primarily for the export trade.

TABLE XVIII. HOPS: CONTRACT AND SPOT PRICES PAID OREGON GROWERS, 1920-1930.\*

(Cents per pound)

Year	Fuggles	Clusters	Spot price, Fall†
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
1920.....	42.0	28.0	44.0
1921.....	36.0	25.5	28.0
1922.....	31.0	30.5	11.0
1923.....	32.0	24.25	27.0
1924.....	27.0	23.0	14.0
1925.....	19.5	17.25	24.0
1926.....	20.0	19.0	25.0
1927.....	20.5	18.25	21.0
1928.....	20.0	19.0	20.0
1929.....	15.0	14.0	13.0
1930.....	15.0	14.0	12.0
Average 1920-1930.....	25.3	21.0	21.7

\* Obtained from confidential records of Oregon dealer.

† Average of months September, October, and November. Made up primarily of Clusters.

## GRADING AND STANDARDIZATION

The grading of hops is indefinite and subject to opinions and prejudices of individual buyers. Their standards are sometimes based on factors known to have little bearing on the use to which the hop is put. The feasibility of adopting definite standards for judging the quality of hops has long been discussed, but little progress has been made toward its realization. Dealers in the trade are generally of the opinion that chemical analysis, while it does give valuable and accurate information regarding the moisture content, quantity of lupulin, percentage of hard and soft resins and essential oils, fails to evaluate flavor, which is so essential in placing a hop in its proper category. Flavor, however, is one of the most difficult factors to apply and at the same time secure uniformity of application. For this reason many of the dealers feel that present methods of classification are about as effective for practical purposes as it is possible to attain, and that chemical analysis can never more than partly overcome the deficiency referred to. Another complicating element is the fact that different buyers have their own preference as to the type of hops they want. Some emphasize richness and flavor, while many others give more weight to color and general appearance. Until there is research work to determine the real factors of utility and quality, grading is likely to be indefinite and confusing.

Also, since climatic and soil conditions are thought to affect the color and flavor of hops, experienced hop men maintain that they can usually classify a hop on the basis of these factors. Certain brewers will use a certain brand of hops for many years and their product becomes identified with a certain flavor which can be obtained only by the use of the same kind of hops year after year.

On the other hand, there are those who feel that physical inspection alone is not entirely reliable in determining the foreign matter, moisture, and resinous content of hops. The same sample is likely to receive different gradings at different observers' hands.\* It is also alleged that in the past an overemphasis has been placed upon geographic origin in determining the

\* See U. S. Department of Agriculture Circular No. 33, "The Necessity for New Standards of Hop Valuation," by W. W. Stockberger.

value of the product. Hops which would be rated of poor quality if their origin were known may obtain favorable consideration when represented as coming from a locality having the reputation of producing fine quality hops.\*

It is not the purpose of the present investigation to undertake a lengthy discussion of this complicated problem. For the future it would seem that certain standards based upon both physical inspection and chemical analysis might ultimately be worked out. There can probably never be a solution of this problem by the use of only one method to the exclusion of the other. Certain it is that there is need for careful research such as is under way in England, that suitable standards may be developed and that by so doing our growers may be guided in their production to meet the quality needs of the brewing industry.

### CONCLUSIONS ON THE SITUATION AND OUTLOOK FOR THE HOP INDUSTRY IN OREGON

From the facts that have heretofore been presented, it seems rather evident that there is little in the foreign market situation which holds promise of expansion in our export trade during the forthcoming years. On the contrary, the trends in United States exports have, of late, been unfavorable owing to greatly increased production abroad, high import duties, and a falling-off in consumer demand. Exports to Continental Europe, which attained considerable proportions for several years, are no longer of significance, and the prospects for regaining those markets are not bright. As has already been mentioned, Continental brewers do not consider the American hops suitable for the type of beers which they brew, and therefore will use our product only under conditions of an acute shortage in Europe.

Those in the trade are of the opinion that, in a normal season's trading under free market conditions, the English brewers would undoubtedly import a substantial quantity of Oregon hops, but at the present time there are a number of circumstances which operate to discourage the use of all qualities of foreign hops in England. Reviewing briefly the reasons for the decline in sales of American hops in the United Kingdom during the past few years the following facts are noted: (1) the depressed economic conditions and excessive beer duty have combined to restrict the output of beer; (2) the large import duty on all foreign hops; (3) the lighter character of beers brewed has necessitated a reduction in the percentage of Oregon hops being used;† and (4) the production of hops in England has, for the last two or three years, been more than sufficient to cover the requirements of brewers, and owing to this overproduction, prices have fallen to very low levels. The opinion seems to prevail that there is a growing tendency for England to become more self-supporting with regard to hops, particularly as long as the present tariff on imported hops is operative. At present, England is in a position to produce all the hops the domestic trade requires, and owing to the great improvement in quality and the certainty with which the crop can be grown, it is believed that English growers will be in a position for many years to cope with any increased demand that may

\* *Ibid.*, pp. 3-4.

† English brewers recognize that the lupulin content of the Oregon hop is high, but they state that, having regard to the increased consumption of beers which are brewed for early sale rather than the old practice of storing the beverage for more or less long periods of time, the lupulin content as expressed in antiseptic value has lately become of lesser importance than formerly.

develop as a result of improvement in future business conditions.\* Of course there will always be a demand for a certain percentage of foreign hops, as brewers will not brew exclusively with one kind of hops.

With regard to the situation in Canada, the prospects do not appear particularly favorable for enlarging our export trade in that direction. The fact that Canada has lately been importing increasing quantities of hops from Europe, coupled with the high import duty and the tendency to increase domestic production, are discouraging elements in the situation as far as Oregon growers are concerned. Conditions in the next few years may, of course, change sufficiently to alter present tendencies somewhat. The prevailing low prices of hops in Europe cannot be expected to continue indefinitely, and when higher prices do come there may be a tendency on the part of Canadian brewers to use more American hops. This possibility, together with the fact that consumption in Canada has been on the increase, may enable United States growers to regain some of the ground they have recently lost.

There are indications throughout the Continent of Europe that the acreage of hops is now being drastically reduced. Prices of the last two or three years have not been remunerative to hop growers. Should the depressed state of prices continue for another year or two it is even possible that the retrenchment of acreage may be carried too far, and with it may come the opposite effect of an acute shortage and high prices. Viewed from the long-time standpoint, however, there seems to be little doubt that Continental Europe will maintain its leading competitive position in world hop production and trade.

Foreign dealers and brewers hold different views with regard to the probable future consumption of beer. The belief in some quarters is that when general improvement in world economic conditions is brought about and reductions made in beer duty and other forms of taxation, a sizable and continual increase in the output of beer can be looked forward to. Others express the opinion that the general trend of public taste and custom seems to be for greater moderation in the consumption of beer and other alcoholic beverages. This, added to the fact that they present one of the easiest and most likely forms of future taxation, does not suggest a rapid or substantial increase in the consumption of beer as a probability.

Since the advent of prohibition in America, there is no doubt that the consumption of hops in this country has remained at much lower levels than formerly.† Over the past decade, however, domestic consumption has apparently been on the increase, the volume of hops retained and received for consumption in the five-year period 1925-1929, averaging approximately 10 million pounds larger than in 1920-1924.‡ While this figure does not represent the difference in actual quantity of hops consumed between the two periods, it does, nevertheless, give an approximate idea of what the consumption trend has been. The rising popularity of hop-flavored malt sirups is largely responsible for this increase.§ According to reports, the business depression of the past year or more has halted the increase in sales of this product. It is difficult to say what the trend of consumption will be in the

\* Since the Fuggles variety is grown primarily for the English and Canadian trade, Oregon hop growers who are contemplating an expansion in acreage of this variety may do well to consider the foreign market situation.

† See Table XII and discussion on page 42.

‡ Table XII, page 42.

§ On the other hand, the use of hops in the manufacture of cereal beverages has actually declined. See Table XII, page 42.

next few years. Many maltsters and brewers believe that there will be no material increase, claiming that malt sirup sales have about reached the saturation point. At any rate, the general feeling in the trade is that there will be no sudden change in the national consumption of hops in the near future.

All things considered, and barring unforeseen circumstances, the market outlook for the hop industry does not seem to justify any appreciable increase in national hop acreage during the forthcoming years. From all the facts which the writer has been able to assemble, there is nothing that would indicate a considerable or rapid increase in the consumption of American hops in the near future, either at home\* or abroad.†

The national hop industry is just recovering from a period of overproduction and low prices. It is gratifying to note that production in 1930 was sufficiently reduced to bring about an improvement in the situation. In times like the present, when most agricultural pursuits are in a depressed condition, it is especially tempting for producers generally to shift to those crops for which the price is favorable. As was mentioned in an earlier section, the growing of hops is not only a costly undertaking, but requires considerable technical knowledge on the part of producers as well. Mismanagement and neglect of the crop are almost certain to spell disaster. The fact that present prices are favorable should not blind growers to the need of adopting a conservative and rational program in their future programs of production. In the past, periodic over- and under-production of this and other farm crops has occurred, mainly because producers, in deciding their production programs, have been influenced primarily by prices received for the current crop, rather than by a well-reasoned plan of trying to adjust production to prospective market demands. This is especially important with a crop like hops, a surplus of which, owing to the singleness of purpose for which the crop is grown, is almost valueless. Added to this feature is the fact that hop growing requires so much time and such a large outlay of capital before profitable harvests can be realized.

The definite upward trend of hop production in Oregon over the past decade,‡ in comparison with a decline in California and a stationary or only slightly increasing tendency in Washington, suggests that this state enjoys certain competitive advantages over the other Pacific Coast states, despite the handicap of lower average yields obtained.§ It also demonstrates the favor with which the trade has accepted the Oregon product,|| and augurs well for the future. There is a question, of course, as to what effect the generally depressed conditions of agriculture might have on the future hop acreage in Washington and California. Alternative crops have apparently bid higher for the use of land in those states than in Oregon, but with the present lower prices of most farm commodities, growers naturally will look around for possible alternative lines of production in the hope of solving their difficulties.

The recent appearance of downy mildew in hop patches of Oregon and Washington presents a new element in the hop situation, the outcome of which

\* Assuming that the prohibition laws of this country will not be modified to permit the legal manufacture of beer.

† That acreage reduction in Europe may be carried too far as a result of present low prices, is here stated as a possibility. See also discussion on page 58.

‡ Figure 6, page 20.

§ Figure 7 and Table IV, page 21.

|| See discussion on page 52.

is still problematical. Should the disease prove as serious as it has in British Columbia and Europe, its control might necessitate a considerable additional cash outlay for labor and spraying materials.\* Rains, fogs, dews, and humid atmospheric conditions favor spread of the disease; and therefore it is possible that the drier sections of Western Oregon will be in a more advantageous position to cope with the problem than regions of greater humidity.

The increasing importance of attaining a high standard of market quality cannot be over emphasized, especially at a time when our export markets are being confronted with such keen competition as at present.† Even though Oregon hops are of high recognized standing, dealers and brewers in the trade have made frequent complaints against our hops. Among the most common and serious criticisms which have been registered are the following:‡ first, the crop has not always been cleanly picked, samples frequently containing many stems and leaves; second, improper curing, hops being under- or over-dried; third, too many mashy or broken hops as a result of careless baling or over-drying; fourth, bales are not always sewed neatly or packed uniformly, and some balers have practiced throwing all the sweepings of broken petals and seeds into one bale, which greatly impairs the quality of that bale; fifth, moldy hops as a result of poor or untimely spraying operations; sixth, seediness of Pacific Coast hops.

With respect to the first criticism, the American hop suffers in comparison with the European product, inasmuch as labor costs in this country are above the European level. The extreme importance of clean picking cannot be stressed too much. In fact, it has often been said that picking and curing determine whether a hop is prime or not.

To dry a batch of hops properly requires the careful judgment of an experienced dryer. Slack or under-dried hops are worse than over-dried hops, as they will spoil in the bale if not redried. Over-drying is of two sorts: first, drying too long, which results in a brittle, broken hop that loses its flavor; and second, high-drying, when hops become scorched by too high a temperature. Some growers also lack adequate drying capacity and load their kilns too heavily.§

Referring to mashy or broken hops, those who have handled both imported and domestic hops state that the imported product is packed much more carefully than the domestic. Careful handling of the hops while being baled would no doubt go a long way toward correcting this situation. Some growers think that the practice of "casing", that is, storing hops for ten days or two weeks before baling them, renders the hops easier to handle and makes for a more uniform pack.

\* That fairly effective control methods can be worked out, however, has been demonstrated abroad, but, of course, only with additional labor and expense. The development of new varieties that are resistant to this disease may also help to solve the problem.

† It should be noted that hop imports into the United States, though still comparatively small, are on the increase despite our very high tariff of 24c per pound. Imports of lupulin are also at higher levels than they were six or seven years ago.

‡ These criticisms might apply with equal relevancy to all Pacific Coast hops.

§ Experiments conducted in England seem to indicate that a better product results when hops are not loaded deeply; also that color and aroma are affected by the maximum temperature employed, and for this reason the temperature should be kept as low as possible consistent with getting the hops dried in a reasonable time. A system of forced ventilation can, no doubt, be used to great advantage in attaining this end. (See address by Mr. A. H. Burgess, entitled "Hop Drying", as reprinted from *The Journal of the Kent County Branch of the National Farmer's Union*, Vol. 28, No. 1, July 1930, p. 23.)

The problem of moldy hops can be largely overcome by thorough and timely spraying. Hops that are cleanly picked, well dried, and free from mold will keep longer in storage than hops that are not.\*

Regarding the last point mentioned, a difference of opinion exists as to whether or not seeds are detrimental from a brewing standpoint.† All are agreed that seeds as such serve only as a filler and are not a source of benefit. A number of dealers state that there never have been any serious complaints regarding seeded hops; that while seeds have no brewing value they are not especially harmful, and buyers have not made enough difference in price to encourage the growing of seedless hops. On the other hand, there are some brewers and maltsters who have criticised the seediness of Pacific Coast hops.‡ As long as the trade generally is not willing to pay enough more for seedless hops to warrant growing them, it is not likely that a radical change along this line will be forthcoming. Oregon growers may do well to consider this matter.

Fortunately, the 1930 crop of Oregon hops showed improvement over the years just previous in the matter of clean picking and proper handling. It is to be hoped that this improvement will continue in the future.

### ACKNOWLEDGMENTS

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\* Ordinarily, the storing of hops presents no difficulties provided reasonable cautions are exercised. Bales should be kept in a cool, dry warehouse where they will be free from vermin and strong sunlight.

† Seeded hops are grown almost entirely on the Pacific Coast. Even in yards where no male plants are grown it is very difficult to keep a hop yard seedless due to the proximity of other yards where male vines are found. Yields per acre are no doubt enhanced by the growing of seeded hops.

‡ One English brewer reports that in Oregon hops 38 percent of the total weight is made up of seeds and strig, as compared to 25 percent in an average English copper hop, and about 12 percent in the seedless Saaz hops of the Continent.

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# Appendix of Tables

**TABLES XIX—XXXII**

TABLE XIX. HOP PRODUCTION BY LEADING PRODUCING COUNTRIES IN THE WORLD, 1880-1930.

Year	Germany	Czecho- slovakia	Yugo- slavia	France	Belgium	Poland	Con- tinent; all others	European Continent total	Great Britain	United States	Canada	Australia and New Zealand	World total
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII
	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds
Average 1880-1884.	51,400	.....	.....	8,100	12,580	.....	14,640	86,720	44,680	31,660	1,140	2,220	166,420
Average 1885-1889.	64,340	.....	.....	8,640	12,700	.....	18,600	104,280	56,491	34,594	940	1,940	198,245
Average 1890-1894.	50,679	.....	.....	7,403	8,300	.....	21,351	87,733	48,952	44,307	1,140	1,984	184,116
Average 1895-1899.	54,662	.....	.....	7,580	8,680	.....	27,462	98,384	54,563	44,391	1,080	1,974	200,392
Average 1900-1904.	44,301	.....	.....	7,072	7,442	.....	30,453	89,268	45,063	46,844	1,561	2,010	184,746
Average 1905-1909.	47,112	.....	.....	9,058	7,633	.....	42,068	105,871	44,822	51,904	1,360	2,414	206,371
Average 1910-1914.	37,679	.....	.....	7,349	7,795*	.....	46,765	99,588	39,574	52,198	869	2,435	194,664
Average 1915-1919.	16,760	.....	.....	3,280	†	.....	†	†	24,707	36,502	651*	2,582	†
1918.	1,984	4,519	331	924	†	110	220†	8,088†	14,560	20,193	†	2,508	45,349†
1919.	9,921	9,700	992	1,855	3,180	882	441†	26,971†	21,168	29,346	337	2,163	79,985†
1920.	19,841	13,889	1,323	10,387	5,038	1,102	661†	52,241†	31,472	34,280	863	2,650	121,506†
1921.	10,251	7,385	2,315	6,646	3,722	2,425	441†	33,185†	25,088	29,340	864	3,076	91,553†
1922.	19,070	12,015	3,086	8,940	3,344	2,866	551†	49,872†	33,712	27,744	681	3,479	115,488†
1923.	8,929	7,165	3,968	4,957	3,192	2,535	331†	31,077†	25,648	19,751	1,000	3,535	81,011†
1924.	17,416	21,385	5,512	11,183	5,478	3,196	595†	65,096†	49,728	27,670	813	3,838	147,145†
1925.	14,330	15,851	5,732	11,069	5,609	3,196	2,502	58,289	39,760	28,573	848	2,935	130,405
1926.	9,028	22,013	6,504	8,881	5,012	3,858	3,053	58,349	37,184	31,522	966	3,174	131,195
1927.	22,685	24,912	13,779	11,168	5,724	5,512	7,165	90,945	28,616	30,658	1,426	3,757	155,402
1928.	24,647	21,682	14,771	9,098	4,874	6,173	3,968	85,213	27,104	32,944	967	3,100	149,328
1929.	32,793	27,227	9,149	15,417	4,370	8,267	4,299	101,522	44,092‡	33,220	1,445	3,322	183,601
1930†	24,752	28,000	3,920	3,360	1,792	2,800	2,240	66,864	28,360	24,727	1,666	.....	.....
Average 1920-1924.	15,101	12,368	3,241	8,423	4,155	2,491	516	46,295	33,130	27,757	844	3,316	111,972
Average 1925-1929.	20,697	22,337	9,987	11,127	5,118	5,401	4,197	78,864	35,351	31,383	1,130	3,258	149,986

I. Data for years 1880-1884 to 1900-1904 obtained from U. S. Department of Agriculture Bureau of Statistics Bulletin No. 50, entitled "Hops in Principal Countries". Years 1905 through 1917 from official sources as obtained from the Division of Statistical and Historical Research, U. S. Bureau of Agricultural Economics. Years 1918-1929 were computed from annual hop reports of Joh. Barth & Sohn, Nuremberg, Bavaria. (Converted into pounds from cwt. of 50 kilos each.)

II, III and VI. Data taken from annual hop reports of Joh. Barth & Sohn, same as in I. Included under "all others" prior to the World War.

IV and V. For the years 1880-1899, use was made of statistical compilation of E. Clemens Horst and Co., San Francisco, entitled "World's Production Hops and Beer, 1880 to 1913, Inc." (Pamphlet collection, Library, U. S. Bureau of Agricultural Economics.) U. S. Bureau of Statistics Bulletin No. 50 for 1900-1904. From 1905 onward, official sources as obtained from the U. S. Bureau of Agricultural Economics.

VII. Years 1880-1914, same as above. For years 1918 through 1929, from annual hop reports of Joh. Barth & Sohn.

IX. E. C. Horst and Co. compilations, 1880-1884; U. S. Bureau of Statistics Bulletin No. 50, 1885-1904; 1905 onward, official sources, through the U. S. Bureau of Agricultural Economics.

X. For U. S. sources see Table XII.

XI and XII. Information from same sources as in IX.

\* Four-year average.

† Data incomplete or not available.

‡ Exclusive of Russia.

§ Joh. Barth & Sohn.

|| Australia only.

¶ Preliminary figures as obtained from Institute of Brewing, for European Countries.

TABLE XX. PERCENTAGE DISTRIBUTION OF WORLD'S HOP PRODUCTION, LEADING COUNTRIES OF THE WORLD, 1880-1929.\*

Year	Euro- pean Con- tinent	Great Britain	Total Europe	United States	Canada	Australia New Zealand	World total
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Average 1880-1884.....	52.1	26.9	79.0	19.0	.7	1.3	100.0
Average 1885-1889.....	52.6	28.5	81.1	17.4	.5	1.0	100.0
Average 1890-1894.....	47.6	26.6	74.2	24.1	.6	1.1	100.0
Average 1895-1899.....	49.1	27.2	76.3	22.2	.5	1.0	100.0
Average 1900-1904.....	48.3	24.4	72.7	25.4	.8	1.1	100.0
Average 1905-1909.....	51.3	21.7	73.0	25.1	.7	1.2	100.0
Average 1910-1914.....	51.2	20.3	71.5	26.8	.4	1.3	100.0
Average 1915-1919.....	†	†	†	†	†	†	†
Average 1920-1924.....	41.9	29.6	71.5	24.8	.7	3.0	100.0
Average 1925-1929.....	52.6	23.6	76.2	21.0	.7	2.1	100.0

\* Data computed from Table XIX.

† Data for war years incomplete for a number of countries; hence percentage figures would be misleading.

TABLE XXI. HOPS: ACREAGE IN LEADING PRODUCING COUNTRIES OF THE WORLD, 1900-1930.\*

Year	Germany	Czechoslovakia	Yugoslavia	France	Belgium	Poland	Continent†		Great Britain	United States	Canada	Australia New Zealand	World
							All others	Total					
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Average 1900-1904	91,913			7,112	5,405		49,272	153,702	49,241	†	†	904	
Average 1905-1909	89,696			7,429	5,578		60,139	162,842	42,417	†	†	1,176	
Average 1910-1914	67,124			6,967	5,459		54,445	133,995	34,622	†	556	1,997	
1919	19,709	21,214	1,730	3,534	3,210	1,260	1,200	51,857	16,745	23,900	444	1,819	94,765
1920	28,651	20,663	2,471	10,403	3,504	1,433	1,402	68,527	21,002	28,000	509	1,981	120,019
1921	27,870	21,349	3,583	10,774	3,731	7,413	2,092	76,812	25,133	27,000	507	2,102	131,554
1922	29,687	20,361	4,028	10,430	4,258	6,178	2,131	77,073	26,452	23,400	507	2,416	129,848
1923	28,691	20,040	4,769	10,166	2,975	6,178	2,110	74,929	24,893	18,440	507	2,451	121,220
1924	28,738	21,720	5,313	10,052	3,123	6,845	2,111	77,902	25,897	20,350	507	2,544	127,200
1925	30,821	25,249	9,217	10,267	3,155	6,173	1,374	86,256	26,256	20,350	507	2,380	135,749
1926	35,012	31,770	13,961	10,939	3,501	6,178	1,477	102,838	25,599	20,800	594	2,207	152,038
1927	38,318	40,421	32,617	11,883	3,744	8,031	2,352	137,366	23,004	25,342	1,037	2,248	188,997
1928	37,740	40,784	29,652	11,886	3,650	9,575	2,317	135,604	23,805	26,200	1,049	2,076	188,734
1929	37,600	42,640	24,700	11,300	3,154	8,896	2,305	130,595	23,986	25,566	1,165	2,105	183,417
1930	31,960	37,520	12,475	7,935	2,544	6,420		98,854	19,997	19,500	948		139,299
Average 1920-1924	28,727	20,827	4,033	10,365	3,518	5,609	1,969	75,048	24,675	25,438	507	2,299	127,967
Average 1925-1929	35,898	38,173	22,029	11,255	3,441	7,771	1,965	118,532	24,530	23,652	870	2,203	169,787

\* Sources of information: Official sources for Germany, France, Belgium, and Great Britain, with the exception of years 1929 and 1930, which were obtained by correspondence with the Institute of Brewing, London, England. Official sources for Canada, Australia, and New Zealand. United States data as in Table XXIII. Czechoslovakia, Yugoslavia, Poland, and Continent "All others" from 1919 to 1928; annual hop reports of Joh. Barth & Sohn, Nuremberg, Bavaria; years 1929 and 1930 from Institute of Brewing, continent "All others" prior to 1919, from official reports for Austria-Hungary.

† Not including Russia, for which the following acreages should be added:

1910-1914 average . . . 22,282    1925 . . . 3,707    1926 . . . 5,940    1927 . . . 7,413    1928 . . . 13,010    1929 . . . 12,355    1930 . . . 8,000

(Data from annual reports of Joh. Barth & Sohn, excepting 1930, which were from Institute of Brewing.)

‡ No data.

§ Complete figures cannot be given.

TABLE XXII. HOPS: PRODUCTION IN LEADING PRODUCING STATES AND THE UNITED STATES, 1890-1930.\*

Year	Oregon	Washington	California	Pacific Coast	New York	United States
	<i>Thousands of pounds</i>	<i>Thousands of pounds</i>	<i>Thousands of pounds</i>	<i>Thousands of pounds</i>	<i>Thousands of pounds</i>	<i>Thousands of pounds</i>
Average 1890-1894.....	6,221	8,022	8,480	22,723	21,464	44,307
Average 1895-1899.....	14,703	5,614	8,908	29,225	15,112	44,391
Average 1900-1904.....	16,419	6,669	9,984	33,072	9,162	42,234†
Average 1905-1909.....	20,352	6,392	14,741	41,485	9,419	50,904†
Average 1910-1914.....	‡	‡	‡	‡	‡	52,198
1915.....	21,000	7,466	21,460	49,926	3,060	52,986
1916.....	19,000	6,818	22,277	48,095	2,500	50,595
1917.....	5,000	5,800	15,708	26,508	2,880	29,388
1918.....	3,500	2,939	12,500	18,939	1,254	20,193
1919.....	6,400	3,484	17,875	27,759	1,587	29,346
1920.....	8,700	5,730	18,900	33,330	950	34,280
1921.....	9,240	5,100	15,000	29,340	.....	29,340
1922.....	9,600	3,384	14,760	27,744	.....	27,744
1923.....	8,339	4,012	7,400	19,751	.....	19,751
1924.....	13,800	4,270	9,600	27,670	.....	27,670
1925.....	15,600	4,973	8,000	28,573	.....	28,573
1926.....	14,950	5,712	8,910	29,572	.....	31,522
1927.....	15,185	4,845	9,900	29,930	.....	30,658
1928.....	15,609	6,464	9,480	31,553	.....	32,944
1929.....	18,445	5,075	9,700	33,220	.....	33,220
1930§.....	15,630	3,652	5,445	24,727	.....	24,727
Average 1915-1919.....	10,980	5,302	17,964	34,246	2,256	36,502
Average 1920-1924.....	9,936	4,499	13,132	27,567	.....	27,757
Average 1925-1929.....	15,958	5,414	9,198	30,570	.....	31,383

\* Sources of data: For years 1890 through 1905 from U. S. Department of Agriculture, Bureau of Statistics Bulletin No. 50, p. 9, with the exception of Pacific Coast states for years 1891-1893, which were obtained from compilation of Isaac Pincus and Son, Tacoma, Wash. (As obtained from the U. S. Bureau of Agricultural Economics Library.) Years 1906 through 1910 from U. S. Department of Agriculture Yearbook 1910, p. 597. Individual states for years 1915-1917 from December 1917 issue of U. S. Department of Agriculture Monthly Crop Report, p. 127. Years 1918-1928 from "A Compendium of Hop Statistics", compiled by Wm. A. Schoenfeld and John Marshall, Jr., Federal Farm Board, in collaboration with Paul C. Newman, Federal Agricultural Statistician. United States figures 1911-1915 from same source. For years 1929 and 1930, December 1930 issue of U. S. Department of Agriculture Crops and Markets, except for Oregon, where Oregon hop dealers' reports were used.

† The totals as given here are somewhat lower than the figures for corresponding years in Table XIX. For United States totals in these years it is believed that the data presented in Table XIX are more nearly in line with actual national production.

‡ No data for individual states in these years.

§ Washington, California, and United States figures preliminary.

TABLE XXIII. HOPS: ACREAGE IN LEADING STATES AND THE UNITED STATES 1915-1930.\*

Year	Oregon	Washington	California	Pacific Coast	New York	United States
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
1915.....	20,000	4,530	14,350	38,880	5,773	44,653
1916.....	20,000	4,500	14,400	38,900	5,000	43,900
1917.....	10,000	3,500	11,900	25,400	4,500	29,900
1918.....	10,000	3,100	11,000	24,100	3,800	27,900
1919.....	8,000	2,600	11,000	21,600	2,300	23,900
1920.....	12,000	3,000	12,000	27,000	1,000	28,000
1921.....	12,000	3,000	12,000	27,000	†	27,000
1922.....	12,000	2,400	9,000	23,400	†	23,400
1923.....	11,550	1,890	5,000	18,440	†	18,440
1924.....	12,000	2,350	6,000	20,350	†	20,350
1925.....	13,000	2,350	5,000	20,350	†	20,350
1926.....	13,000	2,400	5,400	20,800	†	20,800
1927.....	16,742	2,600	6,000	25,342	†	25,342
1928.....	17,000	3,200	6,000	26,200	†	26,200
1929.....	17,666‡	2,900	5,000	25,566	†	25,566
1930§.....	14,000‡	2,200	3,300	19,500	†	19,500

\* Sources of data: Oregon and California, 1915-1917, and New York, 1915-1920 from December issues of U. S. Department of Agriculture "Monthly Crop Reporter." All other data through 1928 from "A Compendium of Hop Statistics", compiled by Wm. A. Schoenfeld, Regional Representative, and John Marshall, Jr., Federal Farm Board, in collaboration with Paul C. Newman, Federal Agricultural Statistician, Portland. Years 1929 and 1930 from December, 1930, issue of U. S. Department of Agriculture "Crops and Markets."

† No acreage estimate given for the state of New York in these years; hence cannot be included in United States total.

‡ From Oregon hop dealers' reports.

§ Preliminary.

TABLE XXIV. UNITED STATES EXPORTS OF HOPS BY COUNTRIES OF DESTINATION, 1910-1930.\*  
(Years ending June 30, 1910-1917; Calendar years 1918-1930)

Year	United Kingdom†	Continental Europe‡	Total Europe	Canada	All others	Total
	<i>Thousands of pounds</i>	<i>Thousands of pounds</i>	<i>Thousands of pounds</i>	<i>Thousands of pounds</i>	<i>Thousands of pounds</i>	<i>Thousands of pounds</i>
1910.....	9,530	20	9,550	634	405	10,589
1911.....	11,782	10	11,792	635	678	13,105
1912.....	10,463	35	10,498	1,326	367	12,191
1913.....	15,409	28	15,437	1,036	1,118	17,591
1914.....	22,220	154	22,374	1,213	676	24,263
1915.....	13,824	19	13,843	1,072	1,295	16,210
1916.....	19,703	91	19,794	626	1,990	22,410
1917.....	824	162	986	801	3,038	4,825
1918.....	76	72	148	749	2,773	3,670
1919.....	12,524	1,552	14,076	2,493	4,229	20,798
1920.....	21,422	20	21,451	1,969	2,204	25,624
1921.....	13,376	672	14,048	2,960	1,452	18,460
1922.....	10,586	1,233	11,819	1,867	1,196	14,882
1923.....	6,246	8,692	14,938	4,008	1,095	20,041
1924.....	5,116	7,672	12,788	2,762	1,841	17,391
1925.....	8,223	6,754	14,977	4,118	1,560	20,655
1926.....	5,015	3,814	8,829	2,757	1,247	12,833
1927.....	8,276	1,587	9,863	3,132	1,124	14,119
1928.....	4,299	153	4,452	2,777	757	7,986
1929.....	4,643	148	4,791	2,461	425	7,677
1930.....	4,758	162	4,920	2,507	213	7,640

\* Compiled from annual reports of the U. S. Bureau of Foreign and Domestic Commerce, "Foreign Commerce and Navigation of the United States."

† Includes also Irish Free State from 1924 onward.

‡ Includes all countries on the Continent of Europe. France, Belgium, Germany, and The Netherlands are most important.

TABLE XXV. PERCENTAGE DISTRIBUTION OF UNITED STATES HOP EXPORTS BY COUNTRIES OF DESTINATION, 1910-1930.\*

(Years ending June 30, 1910-1917; Calendar years 1918-1930)

Year	United Kingdom	Continental Europe	Total Europe	Canada	All others	Total
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
1910.....	90.0	.2	90.2	6.0	3.8	100.0
1911.....	89.9	.1	90.0	4.8	5.2	100.0
1912.....	85.8	.3	86.1	10.9	3.0	100.0
1913.....	87.6	.2	87.8	5.9	6.3	100.0
1914.....	91.6	.6	92.2	5.0	2.8	100.0
1915.....	85.3	.1	85.4	6.6	8.0	100.0
1916.....	87.9	.4	88.3	2.8	8.9	100.0
1917.....	17.1	3.3	20.4	16.6	63.0	100.0
1918.....	2.1	1.9	4.0	20.4	75.6	100.0
1919.....	60.2	7.5	67.7	12.0	20.3	100.0
1920.....	83.6	.1	83.7	7.7	8.6	100.0
1921.....	72.5	3.6	76.1	16.0	7.9	100.0
1922.....	71.1	8.3	79.4	12.5	8.1	100.0
1923.....	31.2	43.3	74.5	20.0	5.5	100.0
1924.....	29.4	44.1	73.5	15.9	10.6	100.0
1925.....	39.8	32.7	72.5	19.9	7.6	100.0
1926.....	39.1	29.7	68.8	21.5	9.7	100.0
1927.....	58.6	11.2	69.8	22.2	8.0	100.0
1928.....	53.8	1.9	55.7	34.8	9.5	100.0
1929.....	60.5	1.9	62.4	32.0	5.6	100.0
1930.....	62.6	2.1	64.7	32.8	2.5	100.0

\* Computed from Table XXIV.

TABLE XXVI. IMPORTS OF HOPS INTO THE UNITED STATES BY COUNTRIES OF ORIGIN, 1910-1930.\*

(Years ending June 30, 1910-1917; Calendar years 1918-1930)

Year	Czechoslovakia†	Germany	Other European countries	Total from Europe	All other countries	Total imports
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
1910.....		2,059,484	1,141,027	3,200,511	49	3,200,560
1911.....		5,249,130	3,300,764	8,549,894	7,637	8,557,531
1912.....		1,770,620	1,219,205	2,989,825	1,300	2,991,125
1913.....		5,044,424	3,449,707	8,494,131	13	8,494,144
1914.....		2,868,370	2,500,723	5,369,093	12,932	5,382,025
1915.....		5,370,388	6,277,123	11,647,511	3,821	11,651,332
1916.....		358,564	317,140	675,704	.....	675,704
1917.....		14,000	221,064	235,064	1,785	236,849
1918.....		.....	121,211	121,211	77	121,288
1919.....		153,379	314,054	467,433	.....	467,433
1920.....	1,705,353	1,374,647	2,792,430	5,872,430	77,069	5,949,499
1921.....	367,820	812,196	420,367	1,600,383	28,546	1,628,929
1922.....	723,572	456,950	19,041	1,199,563	1,380	1,200,943
1923.....	632,555	327,993	13,790	974,338	43,527	1,017,865
1924.....	327,719	50,125	26,685	404,529	1,721	406,250
1925.....	404,643	99,341	73,773	577,757	14,701	592,458
1926.....	313,051	211,268	42,874	567,193	551	567,744
1927.....	324,629	213,894	15,590	554,113	.....	554,113
1928.....	317,810	186,223	75,480	579,513	1,472	580,985
1929.....	376,870	367,571	7,636	752,077	12,553	764,630
1930.....	.....	.....	.....	.....	.....	1,012,931

\* Compiled from annual reports of the U. S. Bureau of Foreign and Domestic Commerce, "Foreign Commerce and Navigation of the United States."

† Included in "Other European Countries" prior to 1920.

TABLE XXVII. HOPS: INTERNATIONAL TRADE, PRINCIPAL EXPORTING AND IMPORTING COUNTRIES, 1909-1913; 1920-1924; AND 1925-1929.\*  
(Calendar year)

Country	Average 1909-1913		Average 1920-1924		1925		1926		1927		1928		1929 Preliminary		Average 1925-1929	
	Im- ports	Ex- ports	Im- ports	Ex- ports	Im- ports	Ex- ports	Im- ports	Ex- ports	Im- ports	Ex- ports	Im- ports	Ex- ports	Im- ports	Ex- ports	Im- ports	Ex- ports
	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds	Thou- sands of pounds
United States.....	6,235	15,416	2,041	19,280	592	20,655	568	12,833	554	14,119	581	7,985	765	6,777	612	12,654
Czechoslovakia.....	†	†	1,637	11,668	1,787	12,389	1,195	16,222	1,139	17,904	1,644	14,452	375	18,737	1,228	15,941
Yugoslavia.....	†	†	165	1,965	298	6,964	169	6,945	273	9,030	198	16,929	218	7,269	231	9,427
France.....	5,436	335	3,854	5,185	4,015	9,114	3,931	6,159	5,407	5,682	4,338	3,612	4,601	3,437	4,458	5,601
Poland.....	†	†	243	661	308	1,661	330	1,850	593	3,843	366	4,699	644	5,711	448	3,553
United Kingdom†.....	21,028	2,162	21,828	1,681	16,872	4,989	10,499	8,800	16,029	6,119	13,264	1,977	12,591	1,478	13,850	4,673
Germany.....	7,688	17,564	4,540	8,249	12,388	1,666	15,953	1,156	10,722	3,825	9,967	3,092	8,011	5,080	11,408	2,964
Austria and Hungary§.....	938	18,333	2,130	420	3,333	209	3,333	253	3,368	208	3,419	389	3,580	137	3,406	240
Belgium and Holland.....	9,853	6,219	8,909	6,096	5,582	4,196	5,557	3,275	6,045	1,877	7,567	1,483	8,116	477	6,573	2,262
Other European Countries  .....	5,347	2,362	3,364	326	4,161	15	4,018	16	4,144	3	4,084	10	4,196	1	4,120	10
Canada.....	1,396	176	2,413	618	3,524	85	2,165	357	1,962	709	2,397	488	2,823	296	2,574	387
Australia, New Zealand.....	1,167	374	661	569	320	409	317	522	149	927	158	1,026	122	397	213	656
Other Countries†.....	1,604	0	3,962	82	2,687	0	2,584	0	2,910	0	2,868	0	2,227	0	2,655	0
Total, 25 countries.....	60,692	62,941	55,747	56,800	55,867	62,352	50,619	58,388	53,295	64,246	50,851	56,142	48,269	50,697	51,776	58,368

\* Sources of information: 1909-1913 average and years 1924, 1925 and 1926 from U. S. Department of Agriculture Yearbook 1928, p. 870; 1920-1924 average computed from data in U. S. Department of Agriculture Yearbooks 1922, p. 751; 1923, p. 838; 1924, p. 792; 1925, p. 992; 1927, p. 946. Data for years 1927, 1928 and 1929 were obtained from the U. S. Bureau of Agricultural Economics, special correspondence.

† Figures for prewar years are included in countries of prewar boundaries.

‡ Includes also Irish Free State from 1924 onward.

§ Austria-Hungary in 1909-1913.

|| Sweden, Switzerland, Denmark, Italy, Norway, and Russia.

† Japan, Argentina, Union of South Africa, and British India.

General Note: Exports represent domestic exports, while import figures are imports for consumption, in so far as it is possible to show them. It should not be expected that world export and import totals for any one year will agree, for the following reasons:

(1) Difference in the "year" of the various countries; (2) imports received a year subsequent to year of export; (3) differences in classification of goods; (4) different and imperfect practices of recording countries of origin and ultimate destination; (5) different practices of recording re-exported goods; (6) opposite methods of treating free ports; and (7) clerical errors.

TABLE XXVIII. HOPS: IMPORTS INTO CANADA FOR CONSUMPTION, BY COUNTRIES OF ORIGIN, 1916-1931.\*  
(Years ending March 31)

Year	United States	United Kingdom	Czechoslovakia	Germany	All others	Total
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
1916	636,346	134,014				770,360
1917	766,791	146,262				913,058
1918	732,496	17,069			5	749,570
1919	997,848	7,137				1,004,985
1920	1,752,331	31,658	1,526		65,227	1,850,742
1921	1,498,185	57,436	52,508	15,109	58,584	1,681,822
1922	2,055,543	45,951	32,263	6,034	1,911	2,141,702
1923	3,121,909	66,145	30,200	162,005	6	3,380,265
1924	2,625,667	78,649	19,899	2,818	104,795	2,831,828
1925	2,569,282	50,531	35,557	56,926	161,495	2,873,791
1926	2,302,981	102,749	32,360	14,973	260,142	2,713,205
1927	1,699,615	208,899	95,935	38,004	208,644	2,251,097
1928	1,466,038	142,390	292,026	26,996	141,445	2,068,895
1929	1,625,829	198,482	408,649	138,080	28,254	2,399,294
1930	1,442,831	228,684	487,079	607,586	38,681	2,802,861
1931	1,019,731	549,898	369,167	527,929	279,552	2,746,277
Average 1916-1920	977,163	67,228	305		13,047	1,057,743
Average 1921-1925	2,374,117	59,743	34,085	48,578	65,358	2,581,881
Average 1926-1930	1,707,459	175,841	263,210	165,128	135,433	2,447,071

\*The foregoing statistics were obtained from correspondence with External Trade Branch Dominion Bureau of Statistics, Ottawa, Canada. (Annual Trade Reports of Canada.)

TABLE XXIX. HOPS: PERCENTAGE DISTRIBUTION OF IMPORTS INTO CANADA FOR CONSUMPTION, BY COUNTRIES OF ORIGIN, 1916-1931.\*  
(Years ending March 31)

Year	United States	United Kingdom	Czechoslovakia	Germany	All others	Total
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
1916	82.6	17.4				100.0
1917	84.0	16.0				100.0
1918	97.7	2.3				100.0
1919	99.3	.7				100.0
1920	94.7	1.7	.1		3.5	100.0
1921	89.1	3.4	3.1	.9	3.5	100.0
1922	96.0	2.1	1.5	.4		100.0
1923	92.4	1.9	.9	4.8		100.0
1924	92.7	2.8	.7	.1	3.7	100.0
1925	89.4	1.8	1.2	2.0	5.6	100.0
1926	84.9	3.8	1.2	.5	9.6	100.0
1927	75.5	9.3	4.3	1.7	9.2	100.0
1928	70.9	6.9	14.1	1.3	6.8	100.0
1929	67.8	8.3	17.0	5.8	1.1	100.0
1930	51.5	8.1	17.4	21.7	1.3	100.0
1931	37.1	20.0	13.4	19.2	10.3	100.0
Average 1916-1920	92.4	6.4			1.2	100.0
Average 1921-1925	92.0	2.3	1.3	1.9	2.5	100.0
Average 1926-1930	69.8	7.2	10.8	6.7	5.5	100.0

\*Data computed from Table XXVIII.

TABLE XXX. WORLD OUTPUT OF BEER BY CONTINENTS, AVERAGED BY GROUPS OF YEARS, 1880-1884 TO 1924-25-1928-29.\*  
(In thousands of U. S. barrels)

Year	European Continent	United Kingdom†	Total Europe	North America‡	All others§	World total
	<i>Thousands of barrels</i>	<i>Thousands of barrels</i>	<i>Thousands of barrels</i>	<i>Thousands of barrels</i>	<i>Thousands of barrels</i>	<i>Thousands of barrels</i>
Average 1880-1884.....	67,996	38,500	106,496	17,921	1,920	126,337
Average 1885-1889.....	75,786	39,672	115,458	24,859	2,320	142,637
Average 1890-1894.....	87,036	44,732	131,768	33,458	1,963	167,189
Average 1895-1899.....	103,481	49,074	152,555	37,536	1,920	192,011
Average 1900-1904.....	113,103	49,905	163,008	46,934	2,304	212,246
Average 1905-1909.....	119,500	48,580	168,080	58,880	4,960	231,920
Average 1910-1913.....	126,450	50,475	176,925	66,425	6,900	250,250
Average 1910-11— 1912-13.....	127,624	50,694	178,318	66,067	5,855	250,240
Average 1919-20— 1923-24.....	66,945	32,011	98,956	9,508	8,069	116,533
Average 1924-25— 1928-29.....	102,176	30,795	132,971	10,139	9,674	152,784

\* Sources of data: U. S. Department of Agriculture Bureau of Statistics Bulletin No. 50, entitled "Hops in Principal Countries with Statistics of Beer Brewing," years 1890 through 1904. Same sources for Germany, Austria-Hungary, and United States, 1880-1889; and for United Kingdom, 1885-1889. All other data through 1910-1913 from compilation of E. Clemens Horst and Co., San Francisco (as obtained from U. S. Bureau of Agricultural Economics Library, Washington, D. C.). Averages for 1910-11 to 1912-13; 1919-20 to 1923-24; 1924-25 to 1928-29 were computed from annual hop reports of Joh. Barth & Sohn, Hop Merchants, Nuremberg, Bavaria. Original data were expressed in thousands of hectolitres; conversion made by considering one hectolitre equivalent to 26.417 gallons, and each United States barrel as 31 gallons.

† Including Irish Free State 1924-1929. Annual figures for the United Kingdom and Irish Free State since 1919 as follows:

1919-20....	37,895,000 bbls.	1923-24....	33,109,000 bbls.	1927-28....	29,579,000 bbls.
1920-21....	32,761,000 bbls.	1924-25....	32,562,000 bbls.	1928-29....	30,055,000 bbls.
1921-22....	29,208,000 bbls.	1925-26....	31,073,000 bbls.	1929-30....	29,342,000 bbls.
1922-23....	27,079,000 bbls.	1926-27....	30,709,000 bbls.		

‡ United States and Canada, 1880-1884 to 1910-1913; All North American countries 1919-20 to 1928-29.

§ All other countries not included elsewhere, for which estimates have been made.

TABLE XXXI. HOPS: NEW YORK AND SAN FRANCISCO WHOLESALE QUOTATIONS; EXPORTED AND IMPORTED AVERAGE PRICE, 1890-1930.  
(Cents per pound)

Year	New York wholesale quotations* (Prime to choice)				Wholesale quotations† Chicago 1895-1913 San Francisco 1914-1929		Ex- ported‡ average price	Im- ported§ average price
	High-low average		First each month		October- Novem- ber- average	Crop year Septem- ber- August	Crop year July-June	Crop year July-June
	October- Novem- ber- average	Crop year Septem- ber- August	October- Novem- ber- average	Crop year Septem- ber- August				
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
1890.....			45.5	33.9			26.6	45.0
1891.....			17.5	23.4			19.2	35.0
1892.....			23.4	22.8			23.7	41.4
1893.....			22.2	17.3			22.0	57.4
1894.....			10.0	10.0			10.7	19.4
1895.....	9.5	8.15	9.5	8.2	8.3	6.8	8.8	22.3
1896.....	11.4	10.18	10.1	10.5	10.3	10.2	11.4	21.0
1897.....	15.3	14.82	14.8	15.1	14.8	12.2	15.4	27.4
1898.....	18.0	16.57	18.3	16.8	17.1	15.1	17.1	43.4
1899.....	13.8	13.30	14.0	13.3	11.8	10.2	13.5	27.8
1900.....	19.8	18.10	19.0	18.3	17.5	16.9	16.5	33.3
1901.....	14.8	18.35	14.8	17.8	13.3	16.2	14.5	29.6
1902.....	35.5	29.70	33.0	29.6	27.8	25.5	24.5	29.5
1903.....	31.3	33.25	28.4	32.6	24.3	29.7	19.3	49.4
1904.....	38.3	31.57	35.0	31.3	33.6	28.3	30.2	45.6
1905.....	19.3	16.15	20.5	16.7	13.0	13.0	24.0	23.5
1906.....	23.8	19.25	19.8	18.9	15.8	12.8	21.0	31.6
1907.....	16.0	12.82	15.0	13.0	10.5	8.6	12.9	22.1
1908.....	13.5	13.75	13.5	13.5	10.0	11.5	12.2	18.1
1909.....	36.8	28.55	36.0	29.0	26.5	21.4	19.5	46.9
1910.....	22.3	27.50	22.3	26.7	16.3	23.5	16.3	31.6
1911.....	54.8	41.85	54.0	48.3	47.3	41.7	38.1	74.6
1912.....	31.8	25.52	31.8	25.4	22.8	20.6	27.1	33.6
1913.....	44.0	41.00	33.5	38.7	27.0	23.6	28.7	51.8
1914.....	34.8	22.25	40.5	22.2	13.3	13.1	24.4	23.8
1915.....	29.0	23.00	28.3	22.6	12.8	11.9	19.6	21.4
1916.....	52.5	43.22	51.5	40.4	11.8	10.7	15.9	25.0
1917.....	79.0	53.75	82.8	55.5	31.2	22.2	28.4	59.7
1918.....	28.2	42.12	27.0	40.9		40.6†	31.3	23.4
1919.....	83.9	88.45	81.9	87.8	81.2	74.6**	57.7	48.8
1920.....	57.5	42.72	56.9	42.5	57.1	36.0	49.0	47.5
1921.....	42.3	31.35	33.2	28.5	19.5	19.9	24.9	38.2
1922.....	23.0	22.82	23.0	22.8	12.5	12.2	19.2	19.8
1923.....	55.8	52.42	55.8	52.2	27.8	28.2	31.8	38.8
1924.....	37.1	32.32	36.9	32.4	14.2	14.1	20.2	50.3
1925.....	62.4	58.87	62.5	59.2	13.5	19.0	25.3	61.9
1926.....	62.1	56.32	62.5	56.9	25.0	24.2	25.8	68.8
1927.....					22.5	22.5	24.4	44.3
1928.....					22.5	19.9	20.7	30.9
1929.....	19.7	19.9	20.2	20.1	17.2	13.7	15.5	15.7
1930.....	20.5		20.5		12.5			

\* High-low average quotations, New York State: For sources of information see footnote, Table XVII.

† Chicago and San Francisco wholesale quotations obtained from same sources as listed in footnote of Table XVII. Chicago quotations: Pacific Coast "Common to Choice", 1895-1902; "Prime to Choice", 1903-1907; "Good to Choice", 1908 onward. Crop year average price 1914-14.1c; 1915-14.7c; 1916-13.7c; 1917-25.2c. San Francisco quotations: 1914-1919, "Willamette Valley Choice". 1920, "Eastern Washington Choice" and "Oregon" hops. 1921 onward, no grades specified.

‡ and § Years 1890-1909 from U. S. Department of Agriculture Bureau of Statistics Bulletin No. 35, entitled "Hop Crop of the United States, 1790-1911", pp. 4-7. For years 1910-1929, data computed from total value and net weight figures on domestic exports from the United States, see footnote, Table XII, for source of information.

|| No data.

† Nine-months' average.

\*\* Seven months' average.

TABLE XXXII. PRICE QUOTATIONS OF ENGLISH, BAVARIAN, AND PACIFIC COAST HOPS AND UNITED STATES AVERAGE IMPORTED PRICE, 1919-1929.  
(Cents per pound)

Year	English average September- December I	Bavarian (German) September-May II	U. S. Imported price July-June III	Pacific Coast San Francisco September- August IV
	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>	<i>Cents</i>
1919.....	74.0	79.5	48.8	74.6
1920.....	61.0	31.0	47.5	38.0
1921.....	68.5	55.0	38.2	19.9
1922.....	48.5	15.0	19.8	12.2
1923.....	58.0	118.0	38.8	28.2
1924.....	42.0	76.0	50.3	14.1
1925.....	46.5	116.0	61.9	19.0
1926.....	51.0	115.0	68.8	24.2
1927.....	54.5	62.0	44.3	22.5
1928.....	51.0	39.0	30.9	19.9
1929.....	22.0	21.0	15.7	13.7

I. Data supplied by Messrs. Tabrum & Son, Hop Merchants, London, England. Obtained through the office of E. A. Foley, Agricultural Attache, Embassy of the United States, London, England. Conversions made at September-December average rates of exchange as reported by the Federal Reserve Board. Not designated whether these are prices paid growers or refer to a later stage of the marketing process.

II. Computed from annual hop reports of Joh. Barth & Sohn, Nuremberg, Bavaria, 1920-21 to 1929-30. Conversions made at September-May average rates of exchange as reported by Federal Reserve Board, 1919-20 to 1920-21. For years 1921 onward the data were expressed on the Goldmark basis in the annual reports. These prices are understood to be for the best Bavarian hops in unpacked condition from the growers. From 1925 onward, designated as Hallertau choice.

III and IV. See Table XXXI.