STORRS Agricultural Experiment Station

An Economic Study of the Agriculture of the Connecticut Valley.

4. A History of Tobacco Production in New England.

CLARENCE IRVING HENDRICKSON

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The complete manuscript of which this is an abridgement, has been submitted to the Faculty of the University of Wisconsin, in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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This bulletin is the fourth of a series dealing with the agriculture of the Connecticut Valley. The titles of previous studies follow:

- 1. Production, Supply, and Consumption of Connecticut Valley Tobacco. (Bulletin No. 134.)
- Connecticut Market Demand for Vegetables. (Bulletin No. 138.)
- 3. Tobacco Farm Organization. (Bulletin No. 165.)

These may be obtained by addressing the Director, Storrs Agricultural Experiment Station, Storrs, Connecticut.

A History of Tobacco Production in New England

by

CLARENCE IRVING HENDRICKSON1

TOBACCO PRODUCTION IN COLONIAL NEW ENGLAND

The commercial production of tobacco in what is now the United States began in Virginia a few years after the settlement of that colony. John Rolfe, the husband of Pocahontas, was the first white man to grow tobacco, having planted some in his garden in 1612.

As England offered a ready market commercial production in the colony followed and increased very rapidly. It is reported that by 1617 tobacco was grown even in the streets and market place at Jamestown. Production soon increased to such an extent that there was more than could be sold at a profit in England and some was taken to Holland, By 1640 so much was grown that the colony ordered all of the bad tobacco and half of the good tobacco destroyed in order to keep up the price. Low prices continued and attempts were made to prohibit the planting of any tobacco for one year.

Thus we see even in these early days tobacco farmers were troubled with overproduction and attempted schemes to adjust supply to demand. As other colonies were established they too took up the raising of tobacco, but Maryland was the only one besides Virginia where tobacco was an important product. In Virginia and Maryland it was the leading agricultural product—in fact those two colonies grew very little else. After the Revolutionary War tobacco raising expanded into the territory being opened up west of the Allegheny Mountains. By the time of the Civil War it had been introduced into all the states that are growing tobacco commercially today.

The early settlers of New England found the Indians growing tobacco and undoubtedly some of them imitated the Indians both in its production and its use. There is evidence that it was produced in Massachusetts, Rhode Island, and Connecticut. Tobacco was one of the commodities traded with the Dutch when the members of the Plymouth Colony first carried on commerce with the colonists at New Amsterdam. Also, there are records of tobacco entering the trade of the Connecticut Valley in the 17th century. It is not at all surprising that the early colonists of New England should have made these attempts at raising tobacco. They were influenced by the Mercantilist principles

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which prevailed in the Old World and were constantly seeking products which they could use to build up a trade. Knowing that Virginia was building its trade on tobacco they quite naturally attempted its production. During the 17th century it failed to prosper in New England. Many laws were enacted which prohibited or regulated its growth, sale, and consumption. Then too the climate was not favorable to the best qualities of tobacco for pipe, chewing, or snuff for which the tobacco was used by the English and other northern Europeans at that time. Trading with the Indians, fishing, ship-building and the carrying trade offered better opportunities than raising agricultural products for export. These were not so profitable, however that New England could, as Virginia did, neglect the production of food and clothing. Farming developed with this trading, shipbuilding and fishing, and during the 18th century gradually pushed its way inland, assuming the form of a nearly self-sufficient agricultural economy. In the meantime fishing and shipbuilding continued to develop and by the second quarter of the century a thriving trade between New England and the West Indies had developed. At this time farmers were growing tobacco for home and local consumption. In two localities a surplus was produced which entered into the West India trade, centering about Windsor and East Windsor, in Connecticut and in the Narragansett country of Rhode Island. In 1753 the Connecticut General Assembly prohibited the shipment of any tobacco not stamped and sealed by the official town packer, and after this date we find "packers" elected as regular officers of the Connecticut Valley towns. The first half of the eighteenth century was a period of commercial growth and expansion for the New England colonies. As a by-product of this development, tobacco became an export from Connecticut and Rhode Island and some of the Connecticut Valley towns in Massachusetts. However, from 1763 to the Revolution there was a period of depression in the colonies. While the causes of the depression are not exactly known, in the minds of the colonists the policies of the English government under George III, particularly the enforcement of the navigation laws, were responsible for the situation. Whatever the causes, the depression affected the tobacco trade adversely. The non-intercourse agreements among the colonists aggravated the situation and the American revolution practically eliminated the commercial trade.

New England's participation in this eighteenth century trade was based on her ability to supply cheap tobacco for the slaves on the sugar plantations, and it was on this basis that she was able to compete with Virginia for the West India trade. This advantage persisted even during the periods of low price and over-supply of tobacco on the European market. While the Virginia tobacco trader had to make tobacco pay its costs of shipment at all times, the New England shipper of mixed cargoes could add some tobacco without adding to the cost of his cargo. This gave the New England trader one advantage of importance.

Conditions After the Revolution

After the Revolution the economic and political conditions in the newly formed Confederation were very unstable because of the lack of a strong central government, the large public debt, the paper money, and the change back to a peace-time basis. Before the Revolution, trade with the West Indies was one of the mainstays of New England commerce and industry; following the Revolution, England denied the newly formed states the right to trade with her West India Colonies. This was an important factor in causing the depression in the New England states. However, conditions soon improved and adjustments were made to the changed situation. By the time the new government was established under the Federal Constitution, a period of prosperity had begun. The new country, particularly the New England states, benefitted by the wars in Europe. The British were compelled to permit the importation into the West Indies of American products. Purcell says: "Connecticut thrived under this stimulus; the Connecticut Valley and Sound towns became centers of a prosperous trade. Tonnage increased, agriculture was encouraged; and money became plentiful, for profits were large despite seizures and admiralty decisions."

The farmers of the Connecticut Valley were again producing tobacco. Purcell says concerning the period when prosperity returned: "Numerous small vessels plied their trade with the West Indies, bringing cargoes of grain, butter, meat, vegetables, tobacco, cattle, horses, and lumber from the northern states and returning with sugar and molasses to be made into rum." This is the same trade which was so flourishing during the middle of the previous century. Bull and King advertised in the Connecticut Courant, March 16, 1799: "Wanted (among other items) 1 Ton Windsor Tobacco." Enfield elected a packer of tobacco in 1786 and on various dates to 1813. Suffield, East Windsor and other towns also elected packers of tobacco at several meetings during this period. Tobacco was also grown in several of the Massachusetts towns in the Valley.

The period of prosperity extended through the last decade of the 18th century and well into the first decade of the 19th. The difficulties with the British over our shipping and commerce resulted in the non-intercourse and embargo acts by which the national government attempted to retaliate. These acts almost put an end to the commerce of the United States, especially the West India trade, which failed to revive in the peace following the War of 1812.

Introduction of Cigars

As the American colonies changed their political status to independent states, they later changed their economic status to a more independent one. The first two decades of the century saw the beginning of manufacturing in New England. The introduction of cigar manufacturing in New England.

facturing at this time not only saved the tobacco industry of New

England but was the cause of its revival and development.

The Spaniards on their early voyages found the Indians of the West Indies smoking rolls of tobacco, and introduced the custom into Spain. It appears that cigars, if introduced into northern Europe, did not gain any popularity there until after 1800. Fairholt states that they were taken to Hamburg in 1796. Their use spread so rapidly that a cigar factory was established there soon after that date. Heavy duties and absolute prohibition tended to keep cigars out of England until about the same time. He states that in 1823 there were 23 pounds of cigars imported. The next year the duties were lowered and 15,380 pounds were imported and by 1830, 253,882 pounds.

Early Imports

Cigars seem hardly to have been known in the United States until nearly the end of the eighteenth century.* Since 1790 records have been kept of imports into the United States. Prior to the year ending September 30th, 1804, cigars were not reported separately from other manufactured tobacco. In that year four million are listed as being imported. The next year 22 million were imported. From a study of imports of tobacco it appears that cigars were separated from other forms of tobacco for only a part of the year ending September 30, 1804. For the previous year ending September 30, 1803, there were 81,518 pounds of tobacco imported from the Spanish West Indies; in 1804 there were 73,918 pounds; while in 1805 there were only 312 pounds; and in 1806, none. In place of the manufactured tobacco, cigars are reported from the Spanish West Indies. A further study of the import of manufactured tobacco from Cuba (Spanish West Indies) would indicate that cigars were first imported from Cuba in any considerable quantity about 1795. In 1790 only 473 pounds of manufactured tobacco was imported from that island; in the next year, 1791, the amount fell to 170 pounds. In 1795 it had risen to 32, 335 pounds, and increased to over 100,000 pounds by 1800.

American Cigars

The common account is that the cigar industry began in the United States in 1801 when a Mrs. Prout of South Windsor, Connecticut, began making cigars. However there is evidence they were sold in Hartford at an earlier date. In a number of issues of the Connecticut Courant, Hartford merchants advertised Spanish and American cigars. The

first advertisement of American cigars noted was in 1799, in the issue of July 22. The first advertisement of cigars noted was in 1791, in the issue of April 25, when Asa and Daniel Hopkins listed cigars among items for sale.

The importation of cigars, or "segars" as the word was spelled then, fluctuated around 20 million until 1811; then with the War it fell off and did not come back to that amount until 1822. The increase in importations became more rapid after 1830 and increased very rapidly from then on to the Civil War.

Early Cigar Prices

In Wright's collection of prices and wages in the Annual Reports of the Massachusetts Statistics of Labor, the first price quoted for cigars was in 1806, when they sold for 25c a dozen. The price for several years was around two cents each. They dropped in 1817 to less than a cent apiece.

It has been noted that American-made cigars were sold in 1799. Most writers agree that cigars were first made in the homes about 1800. Women and children manufactured the cigars and bartered them at the stores for articles they desired. This method continued until the enactment of the revenue laws during the Civil War put a tax on cigars and the establishments producing them. The first cigar factories in New England were established in East Windsor and Suffield, Connecticut about 1810. They were established even earlier in Pennsylvania. The census of 1810 reports a production of 29,061,000 American cigars valued at \$44,253 and 3,898,990 Spanish cigars valued at \$26,-650, the latter from imported Cuban tobacco. The largest production was in the city of Philadelphia which is today the largest producer of cigars. Niles and Pease, in their Gazetteer, published in 1819, state that tobacco was grown in East Hartford, East Windsor, and Windsor, also that "one segar manufactory on an extensive scale" was established in East Windsor. There is no mention of a cigar factory in Suffield. A large part of the fillers used in the manufacture of the cigars of these early factories was imported from the West Indies. The binders and wrappers were from native tobacco. Not all of the binders and wrappers used in the United States were from the Connecticut Valley. In 1830 three factories in Boston reporting the source of the tobacco they used report only tobacco from Virginia, Kentucky and Maryland, and from Cuba and St. Domingo.

At an early date tobacco produced in this area was shipped to other markets to be made into cigars. According to Niles and Pease, part of the tobacco grown in East Windsor was shipped from the town. This would establish the shipment of tobacco for cigars earlier than the commonly stated first shipment from Warehouse Point in 1825.

^{*}Among the stories of the introduction of cigars into the United States is one which gives the credit to General Israel Putnam. He is said to have brought some cigars on his return from the military expedition to Cuba in 1762 and to have sold them in his inn at Pomfret.

Introduction of Broadleaf

After the introduction of cigar manufacturing the next important development in the New England tobacco industry was the introduction of Broadleaf tobacco. The tobacco grown during the first three decades of the century was a narrow leafed type called "shoe string" tobacco. This probably was the type that had been grown for export during colonial days and prior to its use in cigar manufacture. About 1833 a Mr. Barbour of East Windsor is said to have introduced a broad leafed variety from Maryland. From this have developed the present seedleaf, now more generally called broadleaf, varieties.

The new variety produced even better wrappers and binders than the "shoe string" tobacco, and soon displaced it.

Increase in Tobacco Production

The introduction of this new variety together with the increased demand for cigars was responsible for the increase in tobacco production which began about 1835. It was about this time that its production in the Connecticut Valley began to attract attention outside of its immediate neighborhood.

Prior to 1840 there are no data available as to the total amount of tobacco raised and only a limited idea of its relative importance can be obtained from the written material available. That it was relatively unimportant as an agricultural product before 1835 may be gathered from various comments in current publications. After that date mention of it in agricultural publications is much more frequent. The production in 1839 according to the Federal Census of 1840 was 538,000 pounds. This may be an underestimate, as it is believed that the early agricultural census was not complete. For the next few years estimates of its production in the Valley vary from one to five million pounds. The government estimate for 1845 gives a production of almost three and a half million pounds, but since the crop in 1849 was only 1,400,000 pounds, this latter estimate seems very much too high. Prices were higher during the first part of the decade and went lower towards the end, so that the production of tobacco around 1845 may have been larger than in 1849; but the data available do not appear reliable enough to justify any definite statement as to the total production. It may have been as much as three million pounds in 1844, but the changes in price would hardly have caused so large a drop in production by 1849. Massachusetts compiled its first census in 1845 from reports of the assessors; Connecticut also compiled the returns of the assessors in that year into a census. Both of these report the production of tobacco for 1844. In Massachusetts the crop reported was 266,000 pounds and in Connecticut 3,467,000 pounds. Study of the available data and information make it doubtful whether the Connecticut crop was much over two million pounds at the outside, with a total production of two and one half million for New England. Even a reduction from two and one half million pounds to less than one and one half million in 1849 appears rather large when compared with the price changes during this period.

Localization of Production

Before 1835 the production of tobacco except in small garden patches for local consumption was limited to East Windsor and the adjoining towns on the Connecticut River. Even by 1840 the production was centered largely in Hartford County, which raised 471,000 pounds of the total of 538,000 pounds reported in the census. In March 1841 a grower in Warehouse Point estimated that 400,000 pounds were grown in the vicinity of that village. This estimate would indicate that the production of Hartford County was quite localized. A reason frequently given for the importance of tobacco around Warehouse Point was the large number of distilleries there. These distilleries kept many steers and hogs to fatten on the distillers' grain and had large quantities of manure available for the tobacco fields in the neighborhood. The next in production in 1839 was Hampden County, Massachusetts, which had a crop of only 41,000 pounds, which would have required about twenty-five acres for its production. During the forties the tobacco acreage was extended up the Valley into Franklin County, Massachusetts, and to the edge of the Valley into Litchfield and Tolland Counties, Connecticut, and into the Housatonic Valley in the towns of Kent and New Milford, Connecticut, A correspondent of the Brooklyn Gazette said in 1845: "Tobacco is getting to be a great article in agriculture all along the valley of the Connecticut, and it is said there is no land in the world that will produce so good, and so much per acre, as our own land will. We do not work as the Virginians do; here we manure high, and do our work ourselves—all free labor. I have about three acres growing for the first trial, and if it proves a good crop, I shall continue the cultivation of it."

Method of Production

The following method of production was given in 1841 by a farmer of Warehouse Point. He had grown tobacco for ten years and, as he says, his methods were nearly the same as his neighbors'.

I raise from two to three acres of it annually, this being as much as I can attend to well and cultivate properly the variety of other crops of my farm. In giving a full account of the process I will commence with what the tobacco grower calls the bed, which consists of a few rods of rich moist ground, as well

prepared as the most productive garden; on this sow the seed about the 1st of April; as for the quantity of seed, I have no particular rule, probably a spoonful of good seed would be sufficient for one square rod of ground; in about three weeks after it is sown, it will make its appearance. The bed must be kept clean from weeds until the plants are of a suitable size to transplant which will be generally about the tenth of June. The best method of preparing the land on which the crop is to be grown, is to dress the ground in the autumn with a coat of manure, and then another in the spring; in all about thirty loads of good manure to an acre. The land should be frequently plowed in the spring, that the manure may be well mixed with the soil. When the plants are of a suitable size to transplant, the land on which the crop is to be grown should be well harrowed, then rowed, which is performed by attaching chains to a pole about three and a half feet apart, which will be the distance between rows and drawn across the field, which is usually done by two men. On these rows, with a hoe, the hills are made, two and a half feet apart, in which on some rainy day the plants are set, one plant in a hill. If the season is dry, the plants must be watered immediately after they are set out. If any of the plants wither and die, or if the worms destroy them, as they usually do more or less, other plants must be set in the place. The plow or cultivator should be used between the rows to loosen the ground and destroy the weeds, and the plants be frequently and carefully hoed. The worms should be destroyed or they will destroy or very much injure the plants. When the plant puts forth its blossom, so much of the top of the stock should be broken off as has not leaves of sufficient size to remain; also the shoots that spring out between the leaves should all be broken off. When the plants are sufficiently ripe, as they are generally about the 1st of September, they must be carefully cut and laid upon the ground to wilt for a few hours, then be carted to the barn and hung upon poles to cure. The plants fastened to the poles with twine wound around the stock across the pole, top downward, spreading them sufficiently for the free circulation of the air, the poles about one foot apart. The barn should be sufficiently ventilated, but not so much open as to expose the tobacco to wind and storms. Two months of mild weather will generally cure it. When the stem in the leaf is cured hard, it is taken down from the poles in damp weather, when the leaf will not crumble, the leaves stripped from the stock, bound in bundles called hands, and packed for further use. Most of the tobacco in this place is packed in boxes of 300 to 400 pounds each, and sent to the New York or Philadelphia market.

When a barn is built expressly to house tobacco in, as most of them thus used here are, it should be with ten or fifteen foot posts, twenty feet in width, and length as is wanted. A barn of ten foot posts, twenty-four feet wide and sixty feet in length, will usually be large enough to hold the produce of an acre of land.

The produce of an acre of land, well cured, will average about a ton, or from 1500 to 2500 pounds. The quantity depending upon the fertility of the soil, season, cultivation and curing. The comparative amount of labor required in growing this crop is about four to one of corn, that is it requires as much labor to raise one acre of tobacco as it does four of corn.

There are a number of differences to be noted in the raising of tobacco at that date as compared with methods of today. Transplanting was begun a week or two later than is usual at present; setting was done by hand; manure was the only fertilizer used; and instead of putting the plants on lath in the field they were hauled from the field loose on two-wheeled ox-carts, then fastened with twine wound around the butt of the stalk and criss-crossed around the pole.

Manure remained practically the only source of fertilizer for some time. About 1845 a preparation called "poudrette" began to be used on the beds, but manure was the only fertilizer used on the fields.

Cost of Production

The following statement of the cost of producing an acre of tobacco also throws light on the methods. These figures were reported to the Commissioner of Patents in 1845 by an East Windsor farmer. They are evidently estimates made by this farmer and a friend.

Use of one acre of land	. \$15.00
10 carts of manure at \$2.50 \$25.00 Carting and spreading 5.00	15.00
Plowing twice	3.00
Harrowing and marking	. 1.00
7000 plants at 50 cents per thousand	. 3.50
Holding and setting plants	. 3.00
Hoeing four times	. 5.00
Extra attendance to secure and kill worms	. 2.00
Topping and securing	. 4.00
Cutting and hanging up to dry	4.00
Stripping from stalk and packing	. 5.00
Rent of shed to dry in	. 4.00
Freighting to Warehouse Point	. 3.00
	\$67.50

The average production on which this estimate was based was 2,000 pounds per acre. Common estimates place the cost of raising an acre of tobacco at two to four times the cost of producing an acre of corn. Instead of using the disk harrow, farmers plowed the ground twice. A comparison of these figures with present costs shows that the increased costs today are the result of increases in cost per unit of the items rather than of increased intensity of culture. There may be a slight increase in the amount of labor applied to the acre for cultivation, and there is a very considerable increase in the application of fertilizer and the use of machinery. If the amounts given here are at all representative, there is at least a doubling of the amount of fertilizer. In fact there is probably much more, for then the application was made when the tobacco was raised and a large part went to the production of the succeeding crops of grain and hay. Today, however, when used alone, double that quantity of manure is applied each year. Then tobacco was produced in rotation, but now it is produced on the same field year after year.

Introduction of Sweating

In colonial and early national times the tobacco exported was shipped in hogsheads, as was all tobacco packed in the United States. With the revival of shipping after 1810 it is said to have been packed in boxes of various sizes and descriptions, mostly dry goods and other merchandise boxes, then in bales of about 100 pounds with boards on the four sides held together with hoops. Soon it was packed in cases of 300 to 400 pounds and put through the sweating process. Sorting of tobacco began

about 1840. At that time two grades were made, fillers and wrappers. All but the very poorest was put in the wrapper grade. About the same time tobacco buyers began visiting the farmers to purchase the crop to be delivered at the warehouse of the buyers.

Increase in Prices

One reason for the development of the tobacco industry in New England during the first half of the nineteenth century was the gradual increase in tobacco prices during that period. This increase is shown in Table 1, which shows also the increase in purchasing power, which was even greater, because the trend of the general price level after the War of 1812 was downward. Tobacco prices reached a high point in 1841; after that there was a very slight decrease to the end of the decade. However, when compared with the general price level, they were about 50 percent higher than they had been before 1840. Prior to 1845 the price of New England tobacco seems to have been very close to the wholesale price of other tobacco, but from then on it became higher. The increase in the price for New England tobacco was due to the increased demand for cigars. Importation of cigars increased from an average of 23 million annually in 1805 - 1809 to 81 million in 1845 -1849. This increase in importation could be accounted for by the growth in population. More important was the increase in domestic cigar manufacture. In their Gazetteer, Niles and Pease mention only one cigar factory in Connecticut; but by 1850 the census reported 2,029 male employees engaged in manufacturing cigars, and a Mr. Sheldon of Suffield states that by 1850, 152 men and 80 women were engaged in manufacturing cigars in that town alone. Besides those engaged in cigar factories, there were women and children who made "supes" at home to be traded at the local store. It was this increase in domestic production which caused the increased demand for New England tobacco and in turn stimulated tobacco production.

Decline in other Agricultural Prices Relative to Tobacco

At the same time that tobacco prices were rising, the prices of some of the agricultural products of New England were declining. This was particularly true of corn, rye and cheese. These products were meeting competition from the products of the new land being opened up in the west. Rye and corn were the two crops which, next to hay, were most important in the Connecticut Valley. Broom corn was also important, especially in the vicinity of Hadley, Massachusetts. This product also felt the effect of western competition and gave way to the cheaper product from the future cornbelt. Beef cattle raised in the hill towns or purchased from farmers in nearby states were fattened on the farms

of the Valley. This enterprise was more important from Enfield north than in the lower part of the Valley, although it was carried on there too. Butter and cheese were also produced, although relatively not so important to the farmer of the Valley as to the farmer back in the hills. The following table pictures the relative trend of tobacco, corn and rye prices by decades:

TABLE 1

Price Relatives and Purchasing Power of Tobacco, Corn, Rye.

By Decades, 1801 - 1850

Price Relatives

Purchasing Power

			E et a civil	G	eneral Pr	ice		1
Decade	iy)	Tobacco	Corn	Rye	Level	Tobacco	Corn	Rye
1801 - 1810		100	100	100	100	100	100	100
1811 - 1820		123	126	113	108	114	117	105
1821 - 1830		101	79	69	69	146	115	100
1831 - 1840		94	75	81	74	127	101	109
1841 - 1850		111	69	79	57	195	121	139

The purchasing power of the agricultural products of New England tended upward during this period when compared with the general price level, but none increased so rapidly as tobacco. The purchasing power of tobacco was practically two times what it had been at the beginning of the period, while that of corn was about one-fifth greater, and of rye only a little more than one-third greater. The purchasing power of the more important agricultural products of New England, other than tobacco, was slightly more than fifty percent greater. There was no very material change in the relative cost of production, yet tobacco became much more profitable than other agricultural products, especially when compared with the two major tilled crops, corn and rye. Tobacco became profitable for many farmers who had not been able to make a profit at the lower prices prevailing in the earlier decades.

THE EXPANSION OF TOBACCO PRODUCTION

Since 1850 there are more data available for studying a particular agricultural enterprise or the agriculture of any region, in the Federal Census, the work of the Department of Agriculture, state experiment stations and other state agencies, and the agricultural and trade papers.

Rapid Increase in Production at Time of Civil War

In 1849 the production of tobacco in New England was small as compared with that of later years or with the production in the southern states. The million four hundred pounds reported by the census, however, was double the production reported ten years previous. It was during the next decade that tobacco production increased most rapidly,

^{*&}quot;Supes" is the name given to the cigars made in the homes by women and children.

an expansion which appears like the recent expansion of tobacco in the Province of Ontario, Canada. The production in 1859 amounted to nine million pounds and was six times that of 1849. The Massachusetts state census shows that the gain in production was greatest during the last half of the decade. Expansion of the tobacco industry continued during the Civil War. The crop in Massachusetts in 1864, according to the state census, was nine million pounds. After the Civil War there was a slight decline for both states until 1869. During the next decade the trend of production for Massachusetts continued downward, while that for Connecticut was upward. The output of tobacco in Massachusetts declined nearly a million and a half pounds from 1869 to 1874 and another half million to 1879. The Census of 1880 shows an increase of nearly six million pounds for Connecticut over the production of 1869. The total for New England in 1879 was nineteen million seven hundred thousand pounds, which was practically the same as the production at the end of the Civil War. The loss in Massachusetts was offset by the increase in Connecticut. This difference in trends for the two states, together with differences shown by towns within the states, will be discussed in another section.

The trend of acreage follows production during this time, but with less fluctuations from year to year. It was steadily upward from 1849 to the end of the Civil War, then declined to 1869; in Massachusetts it continued downward, while in Connecticut there was an upward trend between 1869 and 1879.

Increase in Prices

For this study the factors causing the changes in production are of much more importance than the changes themselves. Changes in price were no doubt important in effecting the changes in production which have just been described. However, price does not account for the conflicting changes referred to in the preceding section which occurred

Table 2

Price per Pound of Connecticut Valley Tobacco in Cents.

ю	0	-	^		100	0	10	
	х	ה	11	-	-1	х	65	

Year	Farm	Wholesale*	Year	Farm	Wholesale
1850	13		1858	16	30
1851	- 6	20	1859	11	31
1852	14	15	1860	11	25
1853	8	17	1861		20
1854	8	18	1862	14	30
1855	-11	15	1863	25	45
1856	21	29	1864	25	65
1857	13	40	1865	27	43

^{*}Wholesale prices from Aldrich Report.

in the production of Massachusetts and Connecticut. The first important expansion of tobacco, which occurred between 1850 and 1865, was caused by the advance in price between those dates. Around 1850 the average price received by the Connecticut farmer was ten cents a pound. In 1856 it had advanced to an average of twenty-one cents, with a high price of over thirty cents. There was a decline the next year and the prices remained somewhat lower until 1863. Wholesale prices of Connecticut wrappers, and such farm prices as are available, show that prices advanced in 1863, 1864, and the beginning of 1865. This increase was due partly to inflation, but even on a deflated basis there was a fifty percent increase in the wholesale price of tobacco during the Civil War. Inflation itself, with no increase in a deflated price, would tend to increase production.

Factors Tending to Increase Price

This increase in price was a response to the increased demand for cigars. There are no figures on the production of cigars in the United States before 1862, but the trend of importations will show the large increase in the demand for cigars.

TABLE 3

Value of Cigars Imported into the United States by Decades

1820 - 1860

Decade	Value
1820 - 1829	\$1,766,955
1830 - 1839	 7,295,763
1840 - 1849	 10,873,880
1850 - 1859	 33,777,490

(1880 Census Report on Agriculture, Tobacco Manufactures)

Even the fact that imports trebled in the decade prior to the Civil War does not show the total increase in the consumption of cigars. There was a substantial increase in the production of cigars in this country during the same decade. The evidence on this point is indirect but indicates that the increase was 50 percent or more. In Connecticut there was an increase of 71 percent in the number of male employees in cigar factories, in Massachusetts an increase of 58 percent. Cigar makers were not listed separately from other workers in tobacco factories for most states in 1850. However, the total number of male workers in all tobacco factories in the United States more than doubled between 1850 and 1860. The data for 1850 may not be as complete as those for 1860, but even allowing for that, the increase must have been substantial. Then during the Civil War little tobacco was received from the Southern states. Although the tobacco from those states did not

enter into the production of cigars it did have some effect on prices for cigar leaf. Manufacturers of chewing and smoking tobaccos, being unable to get their supplies from their usual source, turned to the northern cigar leaf areas and so increased the demand for that type of tobacco.

Another factor which, like inflation, would affect the attitude of the farmer to a greater extent than it would his financial returns was the increased variation in price received for tobacco in any one year. At the beginning of the decade under consideration, tobacco was sold in two grades, wrappers and fillers. The wrappers made up the greater part of the sales. At this time the price of wrappers was not very different from the price received for the whole crop. Towards the end of the decade, however, the farmer was selling three grades, wrappers, seconds and fillers. The spread between wrappers and fillers had increased very considerably, and the proportion of fillers and seconds was large enough to influence the average price. That which influenced the farmer most was the price of the wrappers rather than the average price for his crop. The larger part of the increase in acreage between 1850 and 1860 was due to farmers who took up the cultivation of tobacco. These new growers were influenced more by the price for wrappers received by some of the best growers than by the average price of tobacco.

Prices Following the Civil War

The close of the Civil War was followed by a sharp break in prices, the highest quotation for Connecticut wrappers being 65 cents at the beginning of the year and 40 cents at the end. The farm price as reported by the Department of Agriculture did not decline until the following year. This decline in prices was undoubtedly the cause of the severe decline which took place in the production for Massachusetts during the last years of the sixties. There was some decline in the production of Connecticut wrappers from 1864 to 1869, although the production reported by the census for the latter year was much greater than that reported for 1859. The rising prices for cigar leaf tobacco prior to and during the Civil War had the effect which has been seen a number of times in speculative markets in real estate and stocks. The expectation that prices will advance encourages many people to come into the market. Many farmers who began the cultivation of tobacco could not produce at a profit even with the higher prices and after a year or two of experimenting were forced out, and others who had been able to make a profit at the high war prices could not do so at the lower prices.

After 1866 a recovery in prices took place which continued until 1874, when the farm price was reported even higher than at the end of the Civil War. In 1875 came a definite decline, and from then on to the nineties tobacco prices fluctuated at about half the level of the war and immediate post-war period.

As was shown, Connecticut increased its acreage and production in 1879 over that of 1869. The recovery of prices after the Civil War to 1874 may have encouraged farmers to expect that a recovery would occur again and to keep on producing in the hope of a higher price. But this movement of production contrary to that expected from the movement of prices raises the question whether there were factors other than price which had some influence on increasing production. These factors will be considered later. The lower prices did result in a reduction of the amount of tobacco grown in Connecticut during the decade of the eighties.

Competition of Wisconsin and Pennsylvania Tobacco

The increasing consumption of cigars since 1830 had resulted in increasing prices for Connecticut Valley tobacco. Cigar consumption increased even more rapidly after the Civil War than before, but Connecticut Valley tobacco decreased in price after 1875 in the face of this increased consumption. One of the reasons offered for this decline is particularly interesting because it has been offered as a reason for the decline in the price of Connecticut tobacco since the World War. It was said that the quality of the tobacco had deteriorated because of the change from the use of manure to the use of commercial fertilizer. However, this was not the important factor; rather it was a case of competition. Cigar leaf tobacco produced in Pennsylvania and Wisconsin was of a darker color than that of the Connecticut Valley. When the demand was for a light cigar, this darker tobacco did not compete with the New England product for use as wrappers. But during the early seventies the preference of the cigar consumer changed to a dark cigar. This change in consumer attitude changed the preference of the manufacturer from the leaf of the Connecticut Valley tobacco to that of Wisconsin and Pennsylvania for wrappers. As a result, the price which the Pennsylvania and Wisconsin farmer received was relatively higher during the last half of the decade than during the first half when compared with the price received by the Connecticut and Massachusetts farmers. This relatively increased price for the Pennsylvania and Wisconsin leaf caused a much larger increase in the production of 1879 over that of 1869 for those two states than occurred in Connecticut, and as has been stated, the production of Massachusetts declined.

Prices of Other Agricultural Products

It is not enough in considering the factors influencing changes in the acreage of a particular crop to consider the changes in price for that product only. Other products which compete for the use of the land and labor of the farmer also must be considered. In the Valley during the period 1850-1880 the principal crops were hay, corn, rye,

and oats. Some beef cattle were produced and fattened, and some butter and cheese made. Corn, rye and oats were the ones which competed most directly with tobacco for the use of the land, and are the ones which will be considered. Taking Hartford County as representative of the tobacco section, corn declined somewhat from 1850 to 1860, but in 1880 it was practically the same as in 1860; this would indicate that the increase in tobacco acreage had not been at the expense of corn. Rye declined very markedly from 1850 to 1880, and oats even more.

Table 4

Production and Estimated Acreage of Cereals, Hartford County

1850 and 1880

(U. S. Census 1850 and 1880)

	Corn		R	.ye	Oats	
	Bushels	Acres	Bushels	Acres	Bushels	Acres
1850	381,741	10,900	150,031	11,500	210,954	8,400
1880	337,109	11,526	86,578	7,620	83,261	3,566

The decline in price due to competition from the Middle West is usually given as the cause of the decline in the acreage of cereals which occurred in New England. The decline in price was an important factor in rendering those products unprofitable for the New England farmer. The increase in wages also tended to make these products unprofitable. Because of the rise of manufactures and the migration to the West, wages rose relative to prices. Wages did decline after the Civil War but not to the same extent. With relatively higher wages

TABLE 5

Relative Farm Prices of Cereals and Tobacco and Relative Wages

Connecticut 1869 and 1879

	Corn	Oats	Rye	Tobacco	Wages*
1869	100	100	100	100	100
1879	53	62	57	44	72

the cost of producing agricultural products increased and under many conditions their production became unprofitable. The question is: Why was tobacco in some New England towns more profitable than other agricultural products after the fall in prices? The relative increase in wages affected tobacco as well as other products; in fact tobacco required more labor per acre than cereals. The farm price of tobacco as

reported by the United States Department of Agriculture declined more than the farm price of cereals. This might lead to the conclusion that tobacco should have become less profitable than the cereals.

The fact that the tobacco acreage was greater in many towns in Connecticut in 1879 than in 1869 is evidence that for those towns it must have been more profitable, relative to other enterprises.

Decline in Price of Cost Items

For cereals, labor and land were practically the only items of cost. Tobacco on the other hand required large amounts of fertilizer and a large investment of capital in sheds. Fertilizer declined in price also. Peruvian guano, a common form of commercial fertilizer, sold for \$69 per ton in 1869 and declined to \$53 per ton in 1880. The cost of fertilizer elements, as calculated by Dr. Johnson in his reports to the Connecticut Board of Agriculture, declined 24 percent for nitrogen, 23 percent for phosphoric acid, and 36 percent for potash. These figures may not indicate the full extent of the decline in the cost to the farmer of fertilizing; by this time inspection of fertilizer had begun and no doubt the quality of fertilizer had been improved. The experience of the farmer in the use of fertilizer increased his knowledge of the proper methods and the proper mixtures to apply so that he would get better results from it. One farmer stated that by 1880 an acre of tobacco could be fertilized as well for \$50 as it could have been in 1868 for \$100. This would indicate a decline of 50 percent in the cost of fertilizer, which would help in making tobacco more profitable relative to other farm products. However, the rapid expansion of tobacco acreage during the period of increasing prices just prior to and during the Civil War indicates that tobacco was much more profitable when compared with the other common agricultural products. With this in mind it is not difficult to see that even if the farm price of tobacco declined relatively more than the farm price of other agricultural products and more than costs, it was still profitable to produce it in 1880 and more profitable than other farm products.

Wrappers Decline Less Than Other Grades

A comparison of the wholesale price of Connecticut wrappers shows that wrappers declined less than the average of other grades. Farmers who could produce a large proportion of wrappers found the profit of producing tobacco declined less than that of the farmer producing average tobacco. During this whole period from 1850 to 1880 farmers were trying out tobacco. Up to 1880 more and more New England farmers found tobacco culture profitable and therefore increased the acreage.

^{(*}Average of three years preceding each census year, except for wages which are reported for only one year. Wages equal arithmetical average of relatives of monthly and daily wage, both without board.)

Introduction of Havana Seed

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Tobacco had been imported from Cuba into the Connecticut Valley almost if not quite as early as cigars were manufactured, to be used as fillers for the better grades of cigars. It is perfectly natural that many attempts should have been made to grow this tobacco in the Valley to supply the demand. The early attempts were not successful. The tobacco grown from Cuban seed did not have the peculiar qualities of flavor which made Cuban tobacco so desirable for fillers, while the leaf was too small to be used as wrappers. There are reports of a few farmers growing tobacco successfully from Cuban seed before the Civil War, but its general cultivation was not successful until about 1875. At this time it was discovered that, grown for several years, it became acclimated and produced a wrapper leaf that was profitable. The seed used for field production was taken from plants of the fourth or fifth generation grown in the Valley. The plant of this variety is smaller, with a narrower, more pointed leaf than the Connecticut seedleaf, or that which is now generally called broadleaf. More plants of the former variety can be set to the acre than of the latter. The Havana seed, as this Cuban variety is called, at that time commanded a somewhat higher price and the production of it spread quite rapidly.

Other Changes in Production

There were a number of other changes in the methods of production in this period. Increased use of commercial fertilizer was a very important one. This fertilizer, as well as the barnyard manure, still was applied by hand although manure spreaders and fertilizer sowers had been invented. A common method of applying fertilizer was to mark off a square of ground and spread a bag of fertilizer over it. The size of the square was varied according to the rate of application. Fertilizer was sometimes applied by plowing furrows three or three and a half feet apart, the distance the rows of tobacco were to be placed, sowing the fertilizer in these furrows and then covering with two or more furrows. Although the disc harrow was being manufactured it was not in general use and many farmers were plowing their land twice instead of using the disc. The plants were still set out by hand. The Prout hoe was in use with some of the larger growers but the common method of cultivation was with a one-horse cultivator. The use of lath for hanging the plants in the shed became quite common although many farmers still tied the plants to poles, as they do today around Hadley, Massachusetts. In putting the plants on the lath a spear was used as at present. The present tobacco wagon with a rack for hauling loaded laths to the sheds took the place of the ordinary farm cart used at first. In the early production of tobacco it was put in the barns or sheds used to house the cattle and general farm crops, but with increased production special tobacco sheds were constructed.

Cost of Production

The following statement of the cost of producing an acre of tobacco in 1880 is typical:

Making seedbed\$	2.50
Seed	.25
Weeding and attention to plant bed	1.50
Rent of land (interest on value) 1	2.00
Stable manure, six cords, at \$8 4	18.00
300 pounds guano at \$56 per ton	8.40
Cost of applying manure	4.00
Plowing land twice	4.00
Harrowing and ridging	3.00
Making hills	1.50
Drawing and setting plants	4.00
Cultivating, hoeing three times ea. \$3.00	9.00
Topping, worming, and suckering	15.00
Harvesting 1	2.00
Taking down, assorting, and stripping	20.00
Bulking	1.00
Use of barns, laths, wagons, etc	2.00
Delivering to market	3.00
Total\$16	51.15

Other estimates give very nearly the same results. Some farmers hired the labor to grow the tobacco at three cents a pound. The farmer furnished the fertilizer, tools, etc. An estimate of the cost of growing an acre yielding 2000 pounds under those conditions was as follows:

Labor	\$60.00
Use of team and implements	20.00
Manure, 6 cords at \$8.00	48.00
300 pounds guano at \$56 per ton	8.40
Use of shed and lath	12.00
Rent of land	12.00
Delivering crop to market	3.00
Total	163.40

The results are practically the same as in the first estimate. It will be seen that the labor cost only \$4.60 more than the fertilizer. These two items made up 71 percent of the total cost. If we compare this cost with that thirty-five years earlier, we find that the cost of fertilizer had more than doubled. It is difficult to compare the quantities of manure, but it is evident that a large part of the increase is due to the increased amount applied. Labor cost had also increased through an increase in amount required to produce an acre and in the rate of wages.

Type of Tobacco Farming Carried On

Even as late as 1880 tobacco was raised in connection with general farming. This was true of those towns where tobacco was produced in the largest amounts as well as in those producing only a small amount. The following description of a farm in Ellington is typical of most of the farms on which tobacco was grown, except that it was slightly larger. On this farm there were 9 acres of corn, 10 of oats, $1\frac{1}{2}$ of potatoes, $2\frac{3}{4}$ of rye, $2\frac{3}{4}$ of tobacco, hay land producing 70 tons of hay and pasture for summer feed for the livestock. The products sold from this farm were tobacco, butter, beef, veal, pork, poultry, eggs and fruit. An idea of the variety of products sold on the tobacco farms is given by the products listed on two other farms. On the first, hay, butter, milk, pork, poultry, and tobacco were sold; while on the other the products were hay, corn, oats, onions, potatoes, tobacco, orchard products, pork and poultry.

The census figures for Hartford County in 1880 give a picture of the typical farm in the tobacco area. There were 68 acres of land in the farm, of which 48 were improved. There were 21 acres of crops of which 15 were in hay, 2 in corn, $1\frac{1}{2}$ in rye, nearly an acre in tobacco, and nearly an acre in potatoes. The rest of the cropland was made up of small amounts of other crops, the most important being oats and buckwheat. Although many of the farms which entered into the averages quoted above did not produce tobacco, yet the average represents fairly well the typical farm of the tobacco area. The average acreage of tobacco per farm on all farms producing tobacco was 1.7 acres as compared with .9 acres, the average for all farms in Hartford County.

Size of Tobacco Enterprise

Most farmers had one or two acres of tobacco which they tended besides doing their other farm work. There were some towns where the farmers were engaged in its production more extensively, yet only eight towns in Hartford County had an average of two or more acres of tobacco per farm. East Hartford, with four acres per farm, had the largest average, and South Windsor the next with three acres per farm. The following frequency table of the acres per farm in East Windsor shows that it was grown mostly in small acreages.

Table 6

Distribution of Farms by Acres of Tobacco per Farm

East Windsor 1880. (U. S. Census 1880)

Acres Tobacco	Numbers of Farms*	
Under 1	14	
1-2	76	
2-3	76 66	
3-4	46	
2-3 3-4 4-5	18	
5 and over	10 .	
Total	230	

^{*}The ten with 5 acres or more were distributed as follows: 4 at 6 acres, 2 at 8 acres, 1 at 5, 10, 36, and 47 acres.

During the period from 1850 to 1880 there was an increase of only one acre in the area of tobacco per farm.

Table 7

Acres of Tobacco per Farm in Connecticut
1850-1880.

Year	Acres per Farm
1850	1.2
1860	* 1.3
1870	1.4
1880	1.7

Variation in Type of Tobacco Farming

During this time, however, there was a tendency for the type of farming to vary in the different towns. There was a tendency towards adaptation and specialization. This is shown by the changes which occurred in the two towns of East Hartford and East Windsor between 1860 and 1880. In East Hartford there was a very significant decrease in the relative amount of cereals produced and a corresponding increase in tobacco. In East Windsor, on the other hand, there was a considerable increase in the proportion of hay and cereals produced but not as great an increase in tobacco as in East Hartford. The increase in the number of cattle was relatively less in East Hartford than in East Windsor. This is shown in the table below.

Table 8

Acres of Cereals, Hay, Tobacco and Number of Cattle per 100 Acres of Improved Land, East Hartford and East Windsor

1860 and 1880 (U. S. Census 1860-1880)

Town		Cereals		Hay		Tobacco		Cattle*	
		1860	1880	1860	1880	1860	1880	1860	1880
East Hartford	16.00	13	6	35	25	2	15	10	14
East Windsor		14	25	28	35	3	6	14	20

East Hartford was tending to specialize more in tobacco while East Windsor was tending to specialize in beef and dairy production. By 1880 there were a few specialized tobacco farms, farms where the cultivated area was mostly in tobacco and there was little other source of income from the farm. There are statements of Professor Stockbridge of Massachusetts Agricultural College and others pointing out

^{*}Not including working oxen.

that due to heavy fertilization of the tobacco land and better tillage methods, including drainage, the yields of hay and grain per acre greatly increased. The table above, showing a considerable increase in cattle relative to the amount of improved land and the amount of hay, supports that conclusion.

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Variation in the Production in Different Towns

Increase in the production of any commodity may be brought about by an increase in the production per farm, by an increase in the number of farmers growing it, or by both. Production may also increase in an area or on certain farms while decreasing in another area or on other farms. In the period of 1850 to 1880 all these changes took place in New England's tobacco industry and affected the total production. These changes are of particular interest because New England is practically one market so far as tobacco is concerned. The price of any one grade varies but little from one part to another. The farm population, too, during this period was quite homogeneous, being practically all of native New England stock. The difference in the response of the farmers in the various parts of New England was not due, then, to differences in the farmers nor to any great differences in the economic forces acting upon the farmer in the form of prices for his products or for the products he purchased. It was the physical environment of the farmers which made them respond differently to the outside economic forces.

Various factors which affected the total output will now be considered. The increased production between 1849 and 1859 was not due in any great extent to an increase in production per farm. The average output per farm in Connecticut was 1735 pounds in 1849 and 1922 pounds in 1859. There were some towns where the production per farm increased materially, particularly Suffield, Manchester, Glastonbury, Enfield, and East Hartford. On the other hand the number of farmers raising tobacco increased from 749 to 3198, or more than fourfold. The success of the farmers already growing it and the stimulation of the rise in price encouraged not only many other farmers in the same towns but many farmers in more distant towns to take up its cultivation. Even up to 1880 the increase in the quantity raised was due much more to the increase in the number of farmers growing tobacco than to the increase in production per farm.

In 1850 the production of tobacco was quite localized. The towns bordering on both sides of the Connecticut River from Hartford on the west and Glastonbury on the east to the Massachusetts line raised 79 percent of the total for Connecticut and 71 percent of the total for New England. Table 11 shows the proportion of the Connecticut and New England production grown in those towns for the crop re-

ported by the census of 1850, 1860, 1870 and 1880. The proportion of both the Connecticut and the New England crop grown in those towns was very much smaller in 1859 than in 1849, showing that there had been a very great expansion in the tobacco area in that decade. During the next decade the expansion continued, particularly in Massachusetts, for the output of the towns along the Connecticut River, which may be called the heart of the New England tobacco section, was only 22 percent of the total New England crop as compared with 29 percent ten years previous. Of the Connecticut crop, however, those towns produced as large a proportion in 1869 as in 1859. During the next decade when prices were lower the towns in the heart of the tobacco section raised nearly half the Connecticut crop and one-third of the total New England crop. Half of the increased production of Connecticut occurred in those towns, while the output of Massachusetts decreased between 1869 and 1879.

TABLE 9 The Proportion of the Connecticut and New England Tobacco Crop Produced in the Heart of the Tobacco Section.

	1047-1079	
Year	Percent of Connecticut	Percent of New England
1849	79	71
1859	44	29
1869	44	22
1879	46	33

The maps showing the production of tobacco as reported by the census present the same picture, a very large expansion in the tobacco area from 1850, more particularly 1855, to the end of the Civil War, then decreases in some towns and increases in others. Maps 2 (1869) and 3 (1879) also show a very large increase in production in the towns of the Housatonic Valley. The increase there was 180 percent as compared with 69 percent for Connecticut as a whole, 79 percent for the heart of the tobacco section, and a decrease of 27 percent in Massachusetts. This very large increase in the Housatonic is to be accounted for in the same way as the large increase in Wisconsin. It was due to the change in the habits or preference of the cigar smoker. As has been mentioned earlier, the fancy of the smoker, or at least enough of the smokers, had changed from the light cigars that were wrapped by the leaf grown in the Connecticut Valley to the darker cigars wrapped by leaf grown in Wisconsin, Pennsylvania and the Housatonic Valley, so that the darker leaf was in greater demand than the light. Many of

the towns in this valley raised more tobacco during this time than at any other before or since. In no other areas in Connecticut were there any important increases in production between 1870 and 1880, and in a number of towns there was a decrease.

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Table 10

Showing the Production and Percentage Increase in Several of the New England Tobacco Areas. (In thousands of pounds.)

1869 and 1879

	Heart of To- bacco section	Housatonic Valley	Other Connecticut	Massa- chusetts
1869	3,612	1,109	3,582	7,313
1879	6,457	3,108	4,242	5,369
Percentage Increase	+79	+180	+18	-27
Increase in pounds	2,845	1,999	660	-1,944

Even in a period of low prices and change in demand to darker tobacco the towns in the heart of the tobacco section continued to increase their production while the decrease took place in areas at a distance which were not so well adapted to tobacco raising. The towns of East Hartford and Glastonbury in the heart of the tobacco section are particularly interesting because of the great increase shown in the output there.

Table 11

Production of Tobacco in East Hartford and Glastonbury and
Proportion of Farmers Producing Tobacco.

	1849	9 - 1879		
	1849	1859	1869	1879
East Hartford				
Pounds	87,130	205,040	493,578	1,339,709
Percent				
Increase		135	140	170
Proportion				
Farmers	39	45	82	93
Glaston- bury				
Pounds	7,850	91,400	204,975	630,270
Percent Increase		1,060*	125	208
Proportion Farmers	9	31	55	50

The increase in production was greater both relatively* and actually in each succeeding decade. The absolute increase in each decade was one-half as great for Glastonbury as for East Hartford.

This large increase of tobacco in East Hartford and the tendency for the farmers of that town to specialize in tobacco to a greater extent than the farmers of other towns can be accounted for by the large proportion of Merrimac sandy loam which is found in that town. This soil is not so favorable for the production of hay or pasture as the heavier textured soils. With heavy applications of fertilizer it is an excellent soil for the production of tobacco for use as binders and wrappers for cigars. In the northwest section of the town of Glastonbury, adjoining East Hartford, there is an extensive area of Merrimac sandy loam. It is in this area that the large increase in tobacco production in that town took place.

THE CONCENTRATION OF TOBACCO ACREAGE IN THE CONNECTICUT VALLEY

The Depression in the New England Tobacco Industry

From 1880 to 1887 there was a steady decline in the acreage and production of tobacco in both Connecticut and Massachusetts. Then for several years the acreage remained about steady at just over fortyfive hundred acres for Connecticut and twenty-five hundred acres for Massachusetts. In 1891 there began a recovery from the depression which had affected the New England tobacco industry since the business depression following 1873. By 1899 the census reported the acreage and production to be greater than any previously reported for the census year. The recovery during this decade was somewhat erratic; during the first two years there was a large increase, then for the next few years there was a decrease to 1898. In 1899 there was a substantial increase nearly equal to the acreage of 1892 and 1893. From 1900 the acreage increased almost steadily to 1910. In 1909 the census reported a production of thirty-eight million pounds, nearly double the output of 1879 which was the greatest amount grown previous to the depression of the '80's.

In studying the factors responsible for the changes in acreage and production just given, it is natural to look at the trend of prices to see if changes in price account for the changes in production. As noted in the previous chapter, the price of New England tobacco declined drastically in 1875 and 1876 but the production in Connecticut did not decline until after 1880. The price of tobacco remained low until 1888. The average farm price for any of these years was never over 16 cents nor below 12 cents. For the ten-year period 1879 to 1888 the average price was 13.5 cents. This low price was an important factor in

^{*}The increase of 1060 percent was of course due to the very small production in 1849.

the decrease in tobacco production during this decade. In 1890, 1891 and 1892 there was a rapid increase in price which explains the large production of 1891, 1892 and 1893. In 1893 the price declined to 14 cents and remained low to the end of the decade. This accounts for the decline in production following 1893. There was a slight recovery at the end of the decade. From 1900 on the price was around 15 cents a pound, except for 1904 when it was 22 1/2 cents and 1907 when it was only 11 cents. The average price for the period 1899 to 1908 was 15.1 cents. When an average price of 13.5 cents during the decade of the '80's resulted in a decline in production, it shows that there must have been some other factor than an increase in price of a cent and a half to account for the trend of increasing production during the decade 1899-1908. When the price for the two decades is adjusted to changes in the purchasing power of money, the average price for the ten years 1899 to 1908 is four cents a pound higher than for 1879 to 1888. The price of tobacco was somewhat higher in comparison with the price of other important farm products of New England from 1899 to 1908 than it was twenty years earlier. Agricultural products as a group were in a more favorable price position when compared with the general price level than they had been previously. Changes in price and particularly the changes in the relative price of tobacco as compared with the general price level and with other farm products undoubtedly did influence changes in tobacco acreage. There were other factors which were important in accounting for the upward trend in acreage. These will be discussed later.

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Continued Competition from Wisconsin

The demand for New England tobacco comes from its use as cigar wrappers and binders. The extent of this demand naturally effects the price of New England tobacco. From 1880 to 1890 the number of cigars produced in the United States practically doubled, yet during this period the price of New England tobacco remained very low. For the price of tobacco to remain at such a low level the supply of cigar tobacco must have increased as fast as the production of cigars. Since the production of tobacco in New England decreased the increased supply came from elsewhere. It was noted that Pennsylvania and Wisconsin increased their output very greatly between 1870 and 1880. While Pennsylvania showed no large increase during the next decade in fact the Department of Agriculture and the census reports show some decline in acreage during the last two years—Wisconsin's production continued to increase and the census reported acreage and production in 1889 nearly twice that of 1879. New York and Ohio also increased their production somewhat. The demand during this decade was for dark cigars, which had begun about 1875. It is stated that the buyers of tobacco preferred Wisconsin leaf, and the large increase in production shows the result of this preference.

Introduction of Sumatra

Another source of supply that became important during this decade and one to which protectionist New England was particularly alert was the importation of Sumatra wrappers from the Dutch East Indies. Tobacco for use in the manufacture of cigars had been imported into the United States almost from the establishment of the Constitution. but prior to 1880 this had been Cuban tobacco which was used as fillers. The New England tobacco grower never felt that this Cuban tobacco was a competitor for his market, in fact he thought that it was a benefit, for the desirable quality of Cuban tobacco for fillers increased the demand for cigars, which in turn increased the demand for New England tobacco for binders and wrappers. Sumatra tobacco, however, is used for wrappers, and the extent to which it displaced New England tobacco took away his highest priced market. The manufacturer of cigars preferred the Sumatra, for the New England leaf had certain defects as a wrapper when compared to the Sumatra. Doctor E. H. Jenkins, Director of the Connecticut Experiment Station, listed the defects as follows:

- 1. Being sorted before sweating, the colors of the finished leaf are not even and uniform.
- 2. The sweat is not even all through the case; the leaf next the case is less perfectly sweated than the middle.
 - 3. The sorted leaves while of one length differ both in width and shape.
- 4. The leaf is too large, and in consequence "unprofitable" to the cigar maker. It cuts so as to leave much waste-binder, cuttings and trash.
- 5. The strains of tobacco grown are numerous; the plantations small; soil, fertilizers, handling vary a good deal—all of which make the small packings differ too much in quality.

Sumatra was also thinner and more elastic and would wrap many more cigars pound per pound than the New England tobacco. The imports of Sumatra leaf were practically insignificant up to 1880, when they reached 130 thousand pounds and gradually increased to four million pounds by 1886.

The Tariff

The New England tobacco grower soon became very much interested in the tariff, and in 1883 a tariff of 75 cents a pound was levied on all leaf tobacco imported for wrappers. This was the first time any distinction had been made in classifying unmanufactured tobacco imported into the United States. The tariff of 75 cents had no effect in decreasing the importation of Sumatra tobacco. Sumatra tobacco being thinner and more elastic produces more wrappers per pound than New England tobacco, and the manufacturer could still pay the duty and wrap his cigars at a lower cost than when he used native grown wrappers. Agitation for increased duties continued which resulted in raising the duty on unstemmed wrappers to \$2.00 per pound in the McKinley

tariff act of 1890. In anticipation of this increased duty and also because of a low price for Sumatra tobacco caused by a large crop on the island, nearly double the usual amount of this tobacco was imported

that year.

The imports for the four years following the passage of the McKinley Act averaged four million pounds as compared with six million in the four years just prior to the act. Although the increased duty may have been partially responsible, other conditions were influential in causing reduced imports. In 1892 a short crop in Sumatra caused high prices for that tobacco and tended to reduce imports. The fact that such a large quantity was imported in 1890 in anticipation of the tariff also provided a supply which undoubtedly tended to cause less importation in the following years. In 1893, as a result of the high prices of the previous year, a large acreage was planted in the island and a large production and low price resulted. This low price stimulated importation into the United States. In 1894 the Wilson tariff act reduced the duty to \$1.50 per pound on unstemmed wrappers. This tariff was in effect until 1897. For the three years in which this lower tariff was in effect less Sumatra tobacco was imported than the average for the four years of the McKinley tariff. This however does not prove that the higher duty was ineffective because the years the Wilson act was in force were the years of depression following the panic of 1893. In 1897 the Dingley tariff increased the duty 35 cents a pound to \$1.85 for the unstemmed wrappers. The next year there was a slight increase in imports followed by a decrease in 1899. They increased in 1900 to six million pounds and have fluctuated around six million pounds annually since then, regardless of tariff changes. At the present time there is agitation for an increase in tariff on Sumatra tobacco. A study of the effect of the previous tariff changes shows that a duty of \$1.50 to \$2.00 a pound did not have any marked effect on imports.

Change to Light Cigars

About 1890 the preference of the cigar smoker turned again to a light cigar and New England tobacco was in a better price position when compared with Wisconsin and Pennsylvania tobacco. From 1890 to 1893 cigar production increased from four billion to four and eightenths billion. With the general business depression there was a decrease again to just over four billion cigars for the next few years, then with improved business conditions there was a steady and rapid increase from 1898 to 1907. In the first year four and one-half billion cigars were produced and by the latter year, seven and one-half billion. This increased demand helped to bring a better price for New England tobacco and thus aided in stimulating increased production.

Shade Grown Experiments

Another development which was of considerable concern to the New England tobacco grower was the growing of tobacco under shade in Florida. The Department of Agriculture believed that the importation of Sumatra offered a challenge to the American tobacco farmer to raise a product which could compete with it. The Department turned to Florida as having soil and climate most like that of the Dutch East Indies. Seed was obtained from the Islands and distributed to tobacco growers in Florida. President Duval of the Florida Central and Peninsula Railroad sent a man to Sumatra who obtained some of the finest strains of Sumatra tobacco. This seed was distributed to growers in Florida. Among the growers who experimented with various types of tobacco including this Sumatra were cigar manufacturers and dealers who operated large tobacco plantations in Florida. This work was not successful until it was noticed that the plants growing under trees were much better than those elsewhere in the field. Then in 1896 experiments were begun growing tobacco under artificial shade. At first slats 1x3 inches were placed on posts but soon cheese cloth was tried and has since been used. The tobacco grown in Florida in this manner from seed from Sumatra was said to be so much like the imported article that it could not be distinguished from it.

News of the success of this work in Florida caused more worry to the New England grower. This competition could not be checked by a tariff. However, at this time the Department of Agriculture was conducting its first work in mapping soils, and the soils of the tobacco sections were among those first studied. In this study the Department found that some of the soil in the Connecticut Valley was quite similar to the soil on which the tobacco had been grown so successfully under cover in Florida. In 1900, as a direct result of this study of the soil, the Connecticut Experiment Station in cooperation with the Bureau of Soils made the first trial of growing "shade" tobacco in the Valley. It was carried on under the direction of M. L. Floyd at Poquonock in Connecticut on about one-third of an lacre. Part of this was set out to plants from Sumatra seed grown in Florida, the remainder to Havana seed. This first trial proved very successful. The tobacco was sent to various tobacco buyers and manufacturers for their opinion as to its merits. All were quite enthusiastic, saying that it was as good as the leaf imported from Sumatra. This encouraged a number of farmers of the Valley to try it out in 1901, and 41 acres were planted to tobacco under artificial shade. This was purchased at good prices by the manufacturers and caused a real boom in "shade" tobacco. Dealers and manufacturers became interested in the production of "shade" grown tobacco. So many had visions of the large profits that could be made from growing tobacco in this manner that 720 acres were planted

in 1902. This did not prove so successful. The year was not particularly favorable and it was found that the Sumatra seed used had a tendency to break up into a large number of varieties so that the product was far from uniform. In spite of rather disappointing results in 1902 there were 445 acres planted in 1903. Again this year the results turned out much as they had in 1902. In the next year there were but 33 acres planted and up until 1910 only small acreages were planted. There were some growers who persisted and the government continued the experiment. The efforts of the government experts were directed particularly towards overcoming the lack of uniformity in the leaf and producing a leaf as nearly perfect for use as wrappers as possible. The Bureau of Plant Industry of the United States Department of Agriculture did this work making many selections of seed from individual plants and also many cross fertilizations. Out of the hundreds of plants which resulted they finally selected four types as suitable for production of wrappers under shade. These four varieties were (1) Uncle Sam Sumatra, (2) Hazelwood Cuban, these two secured by selection of seed from self-fertilized plants, (3) Brewer hybrid, and (4) Cooley hybrid, these two being secured by means of cross fertilization. The Hazelwood Cuban was the one which finally proved economically profitable for the growers.

Spotted Tobacco

Another attempt was made to meet the demand for a wrapper like the Sumatra by growing a spotted leaf. At first they tried to produce this spotted leaf by fertilization but were not successful. A liquid was then sprayed on the leaf to produce the spots. This was quite successful and seemed likely to prove very profitable. The craze for this particular type of spotted leaf was short lived. The spotting of tobacco was carried on during the latter part of the decade of the '90's. In 1897 one company of tobacco jobbers purchased considerable tobacco in the field and had it spotted by a man who had invented a machine for spraying the liquid on the plants. This seems to have been the largest attempt to produce the spotted leaf.

Research on Tobacco

Prior to 1890 little research work had been done by any experiment station or the Department of Agriculture on the problems of the tobacco grower. During the following decade these organizations turned their attention to these problems. Prior to that date some analysis had been made of the various parts of the tobacco plant and many analyses had been made of fertilizers. Much of this early work of considerable value to the tobacco grower had been done by Professor S. W. Johnson, first as chemist for the Connecticut State Agricultural

Society, then as chemist for the Connecticut State Board of Agriculture, and finally as chemist and director of the Connecticut Agricultural Experiment Station.

The competition of the Sumatra tobacco and the depression in the New England tobacco industry of the 80's no doubt were largely responsible for the interest of research organizations in the problems of tobacco growers. Also these organizations had become fairly well

established and were enlarging their scope of activity.

Some of the first work done on tobacco by any research agency was a study of pole sweat of tobacco conducted by W. C. Sturgis of the Connecticut Station and a study of curing of cigar leaf tobacco by heat, conducted by Doctor E. H. Jenkins, also of the Connecticut Station. In 1892 Doctor Jenkins began the first trials with fertilizer on tobacco at Poquonock, Connecticut. This work was carried on for five years through 1896. The work at Poquonock was carried on in cooperation with the Connecticut Tobacco Experiment Company, organized in the winter of 1891-92. The organization of this company shows that some of the progressive tobacco growers had faith in the value of research work to aid in the solution of their problems. Doctor C. A. Goessman of the Massachusetts Station carried on some field experiments on fertilizers from 1893 to 1896. At about the same time the Department of Agriculture began work on tobacco, in 1894 Professor Whitney made a study of the tobacco soils of Connecticut and Pennsylvania. In 1899 one of the first soil surveys in the United States was made in the tobacco district of the Connecticut Valley from Wethersfield and Glastonbury, Connecticut, to South Hadley, Massachusetts. These organizations increased the number of workers and the scope of the work so that they were soon doing research work on tobacco diseases, on the curing of tobacco by artificial heat, on fermentation in bulk, on fertilization, and on breeding new varieties.

Invention of the Tobacco Planter or Setter

During the period under consideration, 1880-1910, some of the most important changes in methods of production occurred. The tobacco setter was invented and came into general use. The records of the Patent Office indicate that many attempts were made to invent a machine to aid in transplanting such plants as tobacco and cabbage. As early as 1873 a C. E. Bates of South Deerfield, Massachusetts, took out a patent on a hand tobacco transplanter. From that date on a large number of patents were taken out on machines for transplanting tobacco and similar plants. A horse-drawn tobacco planter was patented February 9, 1886, by M. Smith of Janesville, Wisconsin. The one which proved the most successful and which has become practically universal in tobacco regions was invented by Frank A. Bemis of Dane, Wisconsin, a patent for which was granted in March 1890. This machine became very popular almost immediately. By 1904 it was

estimated that two-thirds of the tobacco acreage of the Connecticut Valley was set by machine. This invention was one of the important causes back of the large increase in acreage which occurred in the Valley from 1890 to 1910. The machine permitted the farmer to plant a much larger acreage in the planting season. It also reduced the time necessary to plant an acre, one of the peak loads of labor, thus reducing the cost of production. There was the added cost of the machine, but on a large acreage this was not a large item.

Increase in Machinery

There was also increased use of machinery on the farms of the tobacco areas when fertilizer sowers, prout hoes, two horse cultivators, and disc harrows came into quite general use. The table below showing the value of machinery per farm in Hartford County, Connecticut, is evidence of the increasing importance of machinery on tobacco farms after 1890. The value of machinery per farm increased less than \$10 from 1880 to 1890, while in the next decade it increased over \$50 and in the succeeding decade, over \$100.

Table 12

Value of Farm Machinery per Farm, Hartford County, Connecticut.

	1880 - 1910	
1880		\$134
1890		142
1900		216
1910		325

Chemical Fertilizers

Another important change in cultural methods was the continued increase in the use of commercial fertilizer. As stated in the previous chapter commercial fertilizer was used quite early in tobacco production but to a very limited extent, for barnyard manure was the main source of fertilizer. During the period of 1880 to 1910 commercial fertilizer became a very important source of plant food applied in the tobacco area. In 1880 there was an average of \$35 worth of fertilizer purchased per farm in Hartford County; by 1910 this figure had risen to \$211. Tobacco and market garden farms have been the heaviest purchasers of fertilizer. The number of tobacco farms increased very little, so change in the proportion of tobacco farmers would not account for the increased purchases of fertilizers. Much of the increase, however, is due to increased acreage of tobacco, yet the increase in fertilizer was greater than the increased acreage of tobacco, so either a larger proportion of the tobacco acreage must have received applications of com-

mercial fertilizer or more must have been applied per acre. The increase was due to both causes. A large quantity of this fertilizer was manure from the stables of New York. There was, however, an increasing quantity of cottonseed meal, castor pomace, and chemical fertilizers such as nitrate of soda, acid phosphate, etc., being used.

Marketing

Before 1880 the farmers delivered their tobacco loose in the wagons after sorting it into wrappers, fillers, and seconds and tying it into hands. Soon after that date, one account makes it 1883, they began to pack it in bundles which they wrapped with paper. It was delivered in this form to the dealer without stripping into grades. The grading was done by the dealer, who made 15 to 20 grades in place of the three made by the farmer.

Increase in the Number of Acres of Tobacco per Farm

In contrast to the small increase in average acreage of tobacco per farm from 1850 to 1880 was the marked increase in acreage cultivated by the average farmer in 1910. Use of the tobacco setter and other

TABLE 13

Average Acreage of Tobacco per Farm and the Number of Farmers

Reporting Tobacco.

Connecticut 1880 - 1910 U. S. Census.

Year	Number of Farmers	Acres	Year	Number of Farmers	Acres
1879	5,279	1.7	1899	2,909	3.5
1889	2,448*	2.8*	1909	2,869	5.6

machinery was much more economical on the larger acreages than on the smaller. The introduction of these machines and their increased use was responsible to a very large extent for the increased acreage of tobacco per farm.

It was pointed out in the preceding chapter that the increase in tobacco production was largely a matter of the increase in the number of

^{*}The number of farmers who produced tobacco is not given in the Census Report. The figure quoted is the average of a survey by the New England Homestead in 1891. There probably was not an increase of an acre in the average size of the tobacco enterprise per farm during the decade preceding. The Homestead survey omitted the small plots of tobacco which they regarded as non-commercial which are included in the census average. There was probably some increase in acreage per farm due to the fact that less tobacco was produced in the hill towns in 1891 than in 1879. The more intensive tobacco towns had larger acreages per farm than did the towns having less tobacco.

farmers raising tobacco and not of increased output per farm. As the table above shows, the increased acreage per farm in 1909 over 1879 would, with the same number of farms, give an acreage more than three times as large. The total acreage in tobacco actually increased less than three times because of the decrease in the number of farmers producing tobacco. The greatest increase in the size of the tobacco enterprise occurred between 1900 and 1910. The decrease in the number of farms between 1880 and 1890 occurred because many farmers who had been producing a small amount of tobacco gave it up and tobacco production became concentrated on the farms better suited to it. The use of more machinery, particularly the tobacco setter and fertilizer sower, enabled the more favorably situated farmers to increase their production. This is what occurred after 1890, making it possible for not much more than half the number of farmers to increase the acreage almost three fold.

Continued Concentration of Acreage

In the preceding chapter it was shown that from 1850 to 1880 a very large part of the tobacco production of Connecticut and of New England as well was concentrated in a few towns bordering the Connecticut River, which were designated as the heart of the tobacco section. It was shown that there had been an expansion of the tobacco area so that those towns produced less of the Connecticut and New England crops than they had in 1850. It was also shown that during the decade 1870-1880 there was a reversal of the expansion and more of the production was concentrated in those towns. The data for the two decades following show that the concentration continued. A much greater proportion of the tobacco acreage of Connecticut and New England was in the heart of the tobacco section than previously except for the years around 1850.

The table below (Table 14) shows some interesting changes in the distribution of tobacco acreage in New England. There was a concentration of tobacco acreage in the heart of the tobacco section between 1880 and 1890. With the increase in acreage in 1891, 1892, and 1893

TABLE 14 The Proportion of the Connecticut and New England Tobacco Acreage in the Heart of the Tobacco Section.

Year	Connecticut Percent	New England Percent
1879	46	29
1890	67	50
1893	60	43
1899	federal and the second of the	51

there was an expansion in the towns outside of this more specialized tobacco area. As a result the towns in the heart of the tobacco section had a lower proportion of the total acreage. With the decrease in price after 1893 the acreage did not decrease in the towns in the heart of the tobacco section nearly as much as in the towns outside of that area, and in 1899 the towns in the heart of the tobacco section had

as large a proportion of the acreage as in 1890.

Although the tobacco acreage for Connecticut and New England as a whole decreased nearly 50 percent between 1879 and 1889 there was practically no decrease in the heart of the tobacco section. The increase in acreage from 1890 to 1893 was also much less in those towns than in the rest of Connecticut and New England. In 1899 the acreage in the heart of the tobacco section was practically the same as in 1893, if anything slightly larger. In the Housatonic Valley and in other Connecticut towns there was a considerable decrease. In Massachusetts the acreage was practically the same in 1899 as in 1893. This was because of a considerable increase in acreage in the towns of Hadley, Hatfield and Whately which counterbalanced the considerable decrease in other towns of the state. Those three towns and Deerfield are the most important tobacco towns of Massachusetts, producing over half the total tobacco. Those towns with Sunderland occupy much the same relation to the tobacco acreage and production of Massachusetts as the towns in the heart of the tobacco section do to that of Connecticut. In 1890 they produced a larger proportion of the Massachusetts crop than they had previously. With the increase in production from 1890 to 1893 the proportion in those towns decreased somewhat, and in 1899 it was practically the same as in 1890. Although the acreage of tobacco in these towns decreased from 1880 to 1890 it did not decrease as much as the acreage of the other tobacco towns of Massachusetts. They did not increase their acreage in proportion to the general increase of 1893; and as has been stated, they had a larger acreage of tobacco in 1899 when most of the tobacco towns in Massachusetts decreased from what they had in 1893. What happened during this period was that with low prices tobacco production was concentrated on the lands most suitable for it in both Connecticut and Massachusetts. This land was largely confined to a few towns on the Connecticut River. Increased prices and expectation of yet higher prices caused expansion on less suitable land, land which was submarginal for tobacco production under lower prices. With the decrease in price these lands went out of tobacco production, and its cultivation was again concentrated on the more favorable land. In 1897 and 1898 there was a slight recovery in prices and tobacco acreage increased considerably in 1899. This increase, however, was in the towns which had the more favorable tobacco land. New Milford was the only town not bordering on the Connecticut River to show a large increase in acreage in 1899 over that of 1893.

An important factor bringing about the increase in production in the towns bordering on the Connecticut River was the introduction of tobacco setters and the increased use of machinery. On the farms of the Valley towns the fields were large enough and level enough to make the use of this machinery profitable, while on the farms of the hill towns the fields were too small and too rough. Another important factor in bringing about the concentration of tobacco in these towns was the increased use of commercial fertilizers. These towns have large areas of Merrimac sandy loam, Enfield very fine sandy loam, and similar light soils which when fertilized heavily produced excellent crops of tobacco-tobacco light in color and having qualities that made it a desirable wrapper—although not as thin and elastic as Sumatra and cutting to more waste. Mr. Gold, Secretary of the Connecticut State Board of Agriculture, states, "When a town or a neighborhood can take land that is not worth much in ordinary agriculture and, by applying \$100 worth of fertilizer and \$100 worth more of labor and get \$500 in return why that land is going up in value. Some of this worthless, valueless land for ordinary agriculture is producing the highest return of any land in the country." Dr. E. H. Jenkins, Director of the Connecticut Experiment Station, made the following statement: "Light cinnamon-brown leaf, as a rule can only be raised on sandy light lands, which are nearly free from loam or clay." These light soils properly fertilized produced the quality of tobacco which at this time brought a price above the average, so that tobacco production on these soils was profitable when it was not on soils which did not produce as good quality tobacco.

The invention of the tobacco setter and the use of commercial fertilizer gave these soils an added advantage so that tobacco production was concentrated in the towns of the Connecticut Valley where these

soils are found.

THE WORLD WAR AND THE DECREASE IN CIGAR CONSUMPTION

The course of the New England tobacco industry from 1910 to 1914 was quite similar to that from 1900 to 1910—a steady increase in acreage and production, with increasing use of machinery and fertilizer. After 1914 it was influenced to a considerable extent, as were all lines of industry, by the World War.

Continued Increase in Acreage

The trend of tobacco acreage in New England continued upward from 1910 to 1921; since that date it has been downward, with a slight tendency upward again from 1927 to 1930. The largest acreage ever reported for Connecticut was in 1921 when 31,000 acres were in tobacco. The largest acreage for Massachusetts was 10,000 acres

reported for the four years 1918-1921. For both states the acreage in 1921 was nearly double what it had been 10 years earlier; for Connecticut it was nearly three times the acreage of twenty years earlier, and for Massachusetts it was two and a quarter times as large as that of 1900. This increase was at a more rapid rate than that of any other cigar leaf producing area in the United States. In Connecticut, every year from 1910 to 1921 saw an increase in acreage over the preceding year, except 1917; and in Massachusetts there was an increase each year except 1916 up to the maximum of 10,000 acres in 1918.

Expansion of "Shade" Acreage

A part of this increased acreage was due to the expansion which occurred in "shade" grown tobacco. As discussed in the previous chapter the "shade" grown tobacco industry was in the experimental stage from 1900 to 1910. After that it became established and had a remarkable development. In 1910 there were 1,000 acres of tobacco grown under shade in the Valley, by 1915 the amount had increased to 3,600 acres, in 1918 there were 6,000 acres, in 1919 it fell off somewhat but increased the following year, and in 1923 it reached 8,700 acres.

Reaction of "Shade" and Stalk Tobacco Growers to Price Changes

From 1921 the acreage of stalk tobacco declined slightly to 1925. In that year there was a substantial decline of 10,000 acres, or nearly one-third of the acreage of the year before; in 1927 and 1928 there was a slight recovery in Havana acreage. This, however, was practically balanced by an equal decrease in the Broadleaf acreage. The decrease in "shade" came in 1924 and 1925. There was a decline in the two years of 4,000 acres or nearly one-half of the high production of 1923. The acreage of "shade" has increased since 1926 and in 1928 was nearly as large as the high production of 1923, and this year, 1929, will exceed that figure.

It is interesting to note that the decline in "shade" preceded the decline in outdoor tobacco. "Shade" decreased in 1919, Broadleaf in 1925, and Havana seed in 1924. "Shade" again decreased substantially in 1924 and 1925, Havana seed and Broadleaf followed in 1926. It seems very probable that one of the reasons for the quicker adjustment of "shade" acreage to the change in the price situation is the fact that the "shade" producers are larger growers and are also dealers in leaf tobacco and better informed concerning market conditions than the average small grower of outdoor tobacco. By reducing their acreage in 1924 and 1925 the "shade" producers aided in bringing about a better market situation and a recovery in the prices for their product.

Increased Price

STORRS AGRICULTURAL EXPERIMENT STATION, BULLETIN 174

The tremendous increase in production during and immediately following the World War was a response to higher prices which were obtained for New England tobacco. The simple average price per pound for the six years 1910-1915 was two and a half cents higher than for the six years 1904-1909. The first years of the World War did not see any increase in the price of tobacco, in fact the price for 1914 and 1915 was less than for the three preceding years. In 1916 there was a very substantial increase in price. The average price reported by the Department of Agriculture increased from 17 cents to 27 cents. By this time there was a considerable acreage of "shade" grown tobacco and the higher price received for it would have some weight in the average price. However, the average price received by a group of farmers producing Broadleaf increased from 18.5 cents to 24.5 cents from 1915 to 1916. The five years 1916-1920 saw a repetition of the high prices the growers had received during the Civil War period. The average December first price reported by the Department of Agriculture for those years was 38 cents and the average price for Broadleaf was 35 cents.

Decreased Production of Cigars

In the two preceding chapters was shown the tremendous increase in cigar production from 1862 to 1910. The increase in production continued to 1920 when 8.1 billion cigars were produced. From 1907 to 1920, however, the trend in cigar production did not increase at nearly so rapid a rate as previously and since 1920 the trend has been downward. The last few years it has been somewhat stable at 6.5 billion. The average production from 1904 to 1909 was 6.8 billion cigars. It increased to 7.0 billion in 1910-1915, to 7.3 in 1916-1920 and decreased to 6.8 billion for 1921-1926. The decrease in consumption of cigars since the World War is not confined to the United States but is general throughout the world. The enormous increase in cigarette smoking is generally accepted as accounting for the decrease in the use of cigars.

War Time Inflation

The increase of three percent in production of cigars for the period 1910-1915 over the period 1904-1909 was accompanied by an increase of 14 percent in price of tobacco. The increase of four percent in the production of cigars for the period 1916-1920 over the preceding period was accompanied by an increase of 70 percent in the price of tobacco. A decrease in the supply of cigar leaf tobacco would result in an increased price as well as would an increase in demand for tobacco. But the increased price during the period was not due to a decrease in the supply in comparison with the demand. There was a somewhat

larger increase in the amount of cigar leaf consumed in the manufacture of cigars than in the number of cigars produced; that is, the number of pounds used in the manufacture of a thousand cigars increased. Yet the increase in the amount of cigar leaf tobacco grown was over three times the increase in the consumption of tobacco for cigar purposes. The export of cigar leaf tobacco during this time was not large enough either absolutely or relatively to have any marked effect on the price. Of course a very large part of the increase in price, particularly during this last period, was due to the increase in the general price level. The price of tobacco from 1904-1909 when adjusted by the general index of prices averaged 16.8 cents; for 1910-1915 the average was 19.5 cents; and for 1916-1929 it was 21.6 cents. It was shown in the previous chapter that an increase of two or three cents in the deflated price resulted in increased acreage. The fact that the price of tobacco increased faster than the general price level is an important factor in accounting for the increased acreage.

Decline in Price

After 1920 there was a severe decline in the price of tobacco to below the general price level. This decline in price accounts for the decline in acreage. In 1921 the price received by Broadleaf growers declined to 21.5 cents from the 41.0 cents of the year before, and the average price for Broadleaf since 1925 has been 21 cents and for Havana seed 22 cents. There has been a tendency for a slight increase in prices of Havana seed the last few years resulting in increased acreage of that type, while Broadleaf prices and acreage have tended down. Prices of "shade" also declined after 1920 but there was a recovery in 1925 which has resulted in an increase in shade acreage in the last three vears.1

Increase in Stocks of Tobacco on Hand

The decline in price after 1920 cannot all be explained by the decline in the general price level, for tobacco prices, particularly Broadleaf prices, declined more than the general level of prices and went back to pre-war levels. This decline was a result of the decline in cigar production. With the smaller consumption of leaf in the manufacture of cigars, stocks of cigar leaf tobacco accumulated. The doubling of the acreage in New England between 1910 and 1920, with a very large increase in other cigar leaf areas, while there was but a small increase in the production of cigars, resulted in an increase in stocks on hand from 1.3 years' supply for the period 1918-1920 to 2.8 years' supply in 1924. While there has been in recent years a reduction of stocks there has been no indication of a trend towards increased consumption of cigars.

¹Through 1928.

Chronology

Below are listed some of the more important events which have influenced the development of New England tobacco industry:

- 1620-1640 1. Tobacco production was taken up by the colonists of New England soon after they established the several settlements. It was grown in Plymouth Colony, Massachusetts Bay, Connecticut, and Rhode Island for local consumption.
- 1700-1775 2. The development of the carrying trade to the West
 1790-1810 Indies during the first quarter of the 18th century gave
 an export market for New England tobacco. This was
 lost during the Revolutionary War. It was revived for
 a short period following that war and was permanently
 lost with the War of 1812.
- 1790-1820 3. The general use of cigars and their manufacture in the United States began after 1790.
- 1833-1845 4. The Broadleaf variety of tobacco was introduced into the Connecticut Valley in 1833 and had completely replaced the narrow "shoe string" variety by 1845.
- 1845-1865 5. There was a very large expansion in cigar production during the middle of the nineteenth century.
- 1860-1870 6. There was a very rapid increase in cigar leaf production in New England, Pennsylvania, and Wisconsin during and following the Civil War.
- 1870-1880 7. The first successful growing of Havana Seed type of tobacco was made during the seventies. Seed was taken from plants which had been acclimated for three or four years.
- 1875-1890 8. A vogue for dark cigars began in the latter part of the decade of the seventies and ended about 1890.
- 1880-1886 9. The importation of Sumatra was insignificant prior to 1880; by 1886 it had increased to four million pounds.
- 1890 10. The Bemis tobacco setter, the one which has been generally adopted, was patented in 1890.
- 1900 11. Tobacco was first grown under shade in New England at Poquonock, Connecticut, in 1900. The production of "shade" was in the experimental stage until 1910.
- 1914-1923 12. During the World War there was a much more rapid increase in the production of cigar leaf tobacco than in production of cigars in all sections of the United States raising those types of tobacco.
- 1920 13. There was a general decline in cigar consumption and after after 1920.

SUMMARY

I. Market Factors

- A. Changes that affected the demand for New England tobacco.
- 1. Tobacco was first produced by New England colonists in small garden patches for local consumption. The development of the West India trade in the early eighteenth century opened a market for the production of tobacco for export. This stimulated production around Windsor and East Windsor, Connecticut, and in the Narragansett county of Rhode Island. This market was lost during the Revolutionary War, was regained to some extent, but was lost permanently with the War of 1812.
- 2. The next market which developed for New England tobacco was based on the introduction of cigar smoking after 1790. The discovery that the tobacco grown in New England had qualities which made it particularly desirable for cigar wrappers and binders gave rise to the demand which established the production of cigar leaf tobacco in New England. The production of cigars in the United States and with it the demand for New England tobacco developed gradually but slowly until 1850. Then it became quite rapid until after the Civil War. The New England farmers responded to this demand with steadily increasing production, especially from 1830 to the end of the Civil War. This was the most important factor influencing production during this period.
- 3. A temporary falling off of the demand for Connecticut Valley tobacco occurred when smokers shifted to the use of darker cigars wrapped with Pennsylvania, Wisconsin and Housatonic leaf. This brought a decrease in Connecticut production during the eighties.
- 4. The demand for Connecticut Valley tobacco increased again when the smokers again preferred the lighter cigars, about 1890. The demand again declined with the depression in 1893. Recovery came about 1900, and the demand steadily increased until after the World War. This was one, although not the only factor, causing the tremendous increase in tobacco production in New England which occurred during this period.
- 5. The trend of demand for cigars and cigar leaf tobacco has been downward since 1920, resulting in lower prices and lessened production of New England tobacco.
- B. Changes that affected the supply and the competition of New England tobacco.
- 1. New England tobacco had no serious competition for the cigar wrapper and binder market until the Civil War. From the Civil War to 1890 the tremendous increase in tobacco production in Pennsylvania and Wisconsin greatly increased the supply of wrappers and binders. The shift of smokers to dark cigars made this competition

even more effective. This competition caused production in New England to decline.

- 2. The importation of Sumatra tobacco increased the competition, in fact offered even more serious competition than the Wisconsin or Pennsylvania leaf when the preference of the smoker was for a light cigar. Because of the thinness and elasticity of the leaf, Sumatra tobacco wraps a larger number of cigars per pound than New England tobacco. Sumatra tobacco took a large share of the wrapper market, so that an increasing share of New England tobacco had to be sold as binders. This occurred at the time that cigar production was increasing; and although New England tobacco production increased, the importation of Sumatra tobacco tended to keep the price and production of New England tobacco from rising as high as they would have without this competition.
- 3. The competition of the middle west lowered the relative price of wool, beef, cheese, butter, rye, oats, and corn more than milk, eggs, fruits, vegetables, and tobacco. In the towns of the Connecticut Valley, tobacco was the most important of these products. Farm abandonment in the Valley towns is almost negligible as compared with the hill towns. It was tobacco which made it possible for most of the farmers to secure as great or greater rewards there than they could by going into the factories or migrating to the West.
- 4. During the Civil War and the World War the general price level rose very rapidly. The price of tobacco rose faster than the cost of production. This was an important factor in the great increase in production during those periods.

II. Agricultural Science and Technique

A. The introduction of the Broadleaf type of tobacco was the first important improvement in the cultivation of tobacco in New England. That this was a much more desirable leaf for cigar use and yielded a larger profit to the grower is shown by the fact that in ten years it displaced the narrow leafed "shoe string" variety. The introduction of this variety was a contributing factor in the development of tobacco

production during the middle of the nineteenth century.

The development of the Havana Seed varieties displaced the Broad-leaf varieties in a large area after 1870. Although these new varieties were found more profitable over a considerable area, they were never important in the heart of the tobacco section in Glastonbury, East Hartford, South Windsor, and East Windsor. The area where these varieties were grown was the area where tobacco production declined the most during the eighties. It is probable that the introduction of these new varieties tended to retard the trend since they proved more profitable than the Broadleaf varieties in those areas.

B. The use of commercial fertilizer was one of the most important changes in methods of production which the tobacco farmers made. It made possible the production of tobacco year after year on the same land. It thus did away with crop rotation on each farm and allowed specialization in the production of tobacco.

Organic fertilizers were first used—dried fish, cottonseed meal, bone meal, and manure from the stables in the cities. After 1906 mineral fertilizers became a more important source of fertilizer elements. In recent years nitrogen from chemical sources has become important.

- C. Another factor in bringing about specialized production and increased production was the invention of the setter and the increased use of machinery. The increase in tobacco production from 1900 to the World War was to a very considerable extent due to the lowering of the cost of production by the use of the tobacco setter and other machinery. It tended to increase specialization as the reduction in costs was greater on the larger acreages. Before the invention of the setter, the farmer growing ten acres of tobacco had much less advantage over the farmer growing two or three acres than he did after. Commercial fertilizer and machinery complemented each other in bringing about specialization. Commercial fertilizer enabled a farmer with a small acreage to put his whole farm in tobacco so that he had acreage enough to use machinery advantageously.
- D. The introduction of growing tobacco under "shade" had a very great effect upon the tobacco industry. This method produced a thinner leaf, a pound of which will wrap more cigars than a pound of Broadleaf or Havana Seed. As stated previously the introduction of Sumatra had taken part of the market for cigar wrappers. At present only a small number of cigars are wrapped with Broadleaf.

The cost of production of "shade" is so high and the losses from a failure are so great that it is produced by large corporations rather than by individual farmers.

Many other changes in methods of production influenced the profitableness of tobacco raising. Those listed are the ones which have had the greatest influence to date. There has been much experimentation in the control of disease and the use of fertilizer on tobacco. These experiments have been very valuable in lowering costs.

III. Natural Environment

An increase or decrease in the price of a product does not cause all farmers producing it to increase or decrease their production in the same proportion. Some farmers will increase or decrease production with a small change in prices, others will not change at all. Some will make much greater changes than others in response to price changes. The same is true of changes in methods of production. All farmers do not respond to new methods in the same degree. Variations in soil

and topography have largely determined the kind and the extent of changes which tobacco farmers have made because of changes in price and methods of production.

A. Soil

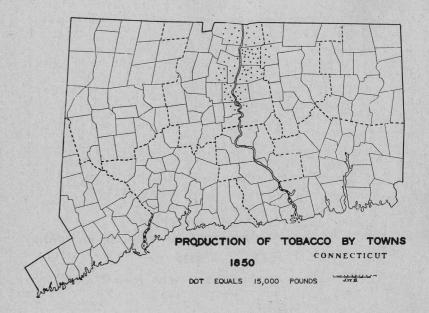
- 1. The production of tobacco has been limited almost exclusively to the light sandy soils. In periods of high prices, as during the Civil War and World War, some tobacco is grown on soils of heavier texture. During the period when dark cigars were in demand, some of the heavier soils were also used for tobacco.
- 2. The increase in production resulting from the use of commercial fertilizer was much greater on some soils than on others. The use of fertilizer caused a much greater increase in tobacco production on Merrimac sandy loam than on any other soil.
- 3. The use of fertilizer and the production of "shade" made it possible to produce tobacco at a profit on certain areas of Merrimac sand. "Shade" tobacco is practically the only tobacco grown on this soil type. This kind of soil is practically useless for any other type of farming.

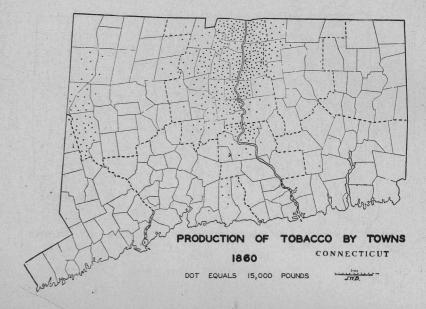
B. Topography

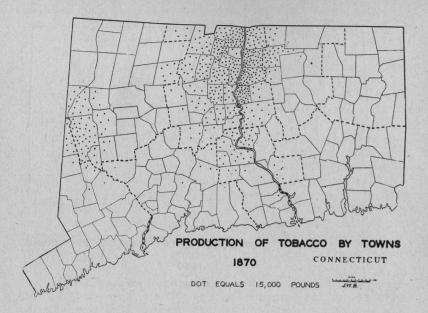
The influence of topography on tobacco production is through the limitations which a rolling or rough topography places on the use of machinery. The expansion that was stimulated by the use of machinery was on the level land of the Connecticut Valley. Some of the rougher areas which had produced tobacco previous to this were forced out of production after 1890.

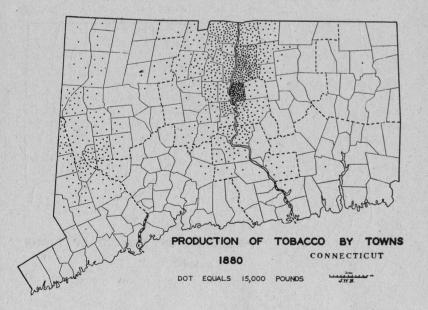
C. Effect of Price Changes on the Geography of Tobacco Production.

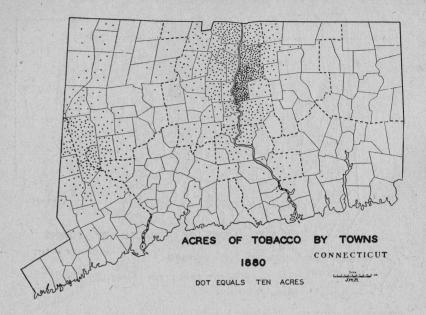
A rapid increase in price, during the Civil War, from 1890 to 1892, and the World War, stimulated tobacco production on soils and topography that are less favorable to its production. Then with the decline in price those areas made the greatest reduction in acreage. Production in the heart of the tobacco section has been more stable. The changes which have occurred in the areas of more favorable soil and topography have been due more to changes in methods of production than to changes in price or the use of fertilizer and machinery.

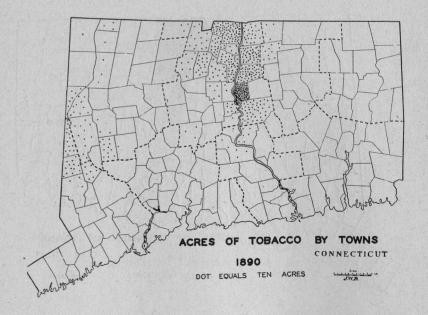


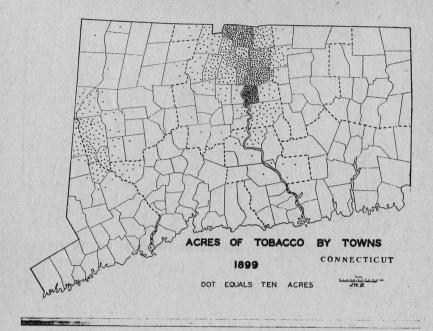




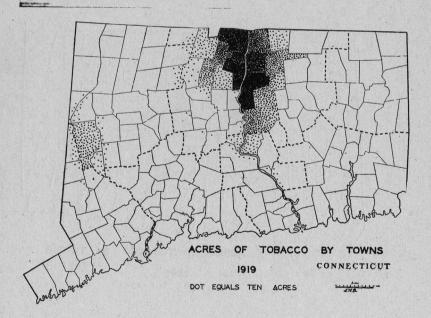


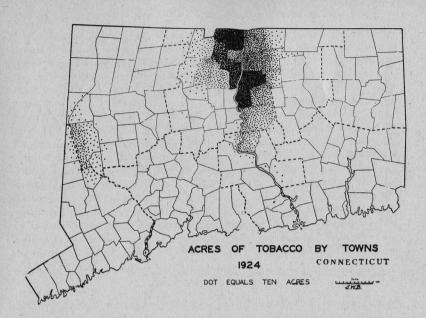




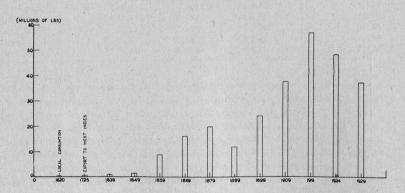


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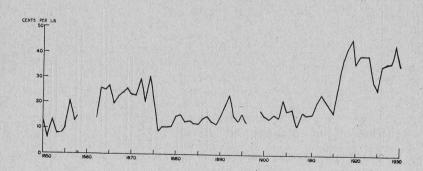




GRAPHIC HISTORY OF TOBACCO PRODUCTION
NEW ENGLAND
(IN MILLION POUNDS)



FARM PRICE OF NEW ENGLAND TOBACCO 1850 - 1930



APPENDIX

Status of Tobacco Production in the United States

While it is possible to grow tobacco in any state in the Union it is of commercial importance in only twenty-five. The tobacco produced in the different parts of the United States has different characteristics due to differences in variety, soil, climate, and methods of growing and curing. Because of these differences in the leaf produced, the tobacco of the United States is classified into different types. The United States Department of Agriculture recognizes twenty-nine distinct types. These are grouped into six classes. Each class has qualities which make it preferred for particular uses but all the tobacco of a given class is not used solely for any one purpose. The six classes recognized by the Department of Agriculture are as follows: flue-cured, air-cured, fire-cured, cigar filler, cigar binder, cigar wrappers. The first three classes are named according to the method of curing the leaf, the last three are named according to the principal use to which the leaf is put. The cigar types are raised in the northern states except for a small quantity in Florida and Georgia, while the other types are raised in the southern states. The chief uses of the different classes are as follows: the bright flue-cured is used for cigarettes; the dark fire-cured is exported to Europe where it is used for cheap cigars, for smoking, chewing tobacco, and for snuff. In the United States it is also used as pipe tobacco. Of the air-cured

APPENDIX TABLE 1

Average Annual Acreage, Production, Yield per Acre, Price per Pound and Farm Value of Tobacco by Classes. United States 1925-1928.

(United States Department of Agriculture Yearbooks 1926-1928)

Class	Acres	Yield per Acre pounds	Production 1,000 pounds	Price per pound cents	Farm Value \$1,000
Flue-Cured	947,675	681	645,031	21	\$135,496
Fire-Cured	210,425	767	161,348	11	17,880
Air-Cured	434,450	798	346,578	19	65,836
Cigar Fillers	64,337	1,155	74,285	12	9,050
Cigar Binders	60,473	1,287	77,843	18	14,344
Cigar Wrappers	9,315	1,017	9,473	84	7,938

class Burley is the most important. It was formerly used mainly for sweetened plug but recently has been used extensively for cigarettes. The cigar classes, as their names indicate, are used for fillers, binders, and wrappers of cigars.

The importance of these various classes in the United States is shown in Table 2. There are more than twice as many acres of flue-cured tobacco raised as of any other class, and nearly twice as many pounds produced. The air-cured class is next in importance. These two classes, as was stated above, are the main source of the tobacco used in cigarettes. The fire-cured class is third in acreage and amount produced. Cigar fillers rank fourth in acreage but only slightly higher than cigar binders, and in pounds produced are exceeded by the latter. The smallest acreage is de-

voted to cigar wrappers, but the price received for these types is considerably higher than that for other types of tobacco. Flue-cured, air-cured, and cigar binders are next in value per pound. There is not much variation in the average price of those three classes. There is more variation in the price of the different types within these classes than between the classes themselves. There is also considerable difference between the classes in yield per acre. The cigar binder classes have the highest average yield, with cigar fillers second, cigar wrappers third, air-cured fourth, fire-cured fifth, and flue-cured last. The average yield per acre of the cigar binder class is nearly double that of the flue-cured class.

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Cigar Tobacco

Table 2 shows the relative importance of the cigar classes and types, and the regions where they are grown. Pennsylvania produces the largest amount of cigar fillers, with the Miami Valley in Ohio and Indiana second. A very small amount is produced in Florida and Georgia. There are two regions producing cigar binders, the

APPENDIX TABLE 2 Average Annual Acreage, Production, Yield per Acre, Price per Pound, and Farm Value of the Cigar Types, United States 1925-1928.

Types and Region	Type No.	Acreage	Yield per acre lbs.	Production 1000 lbs.	Price per lbs. cents	Farm Value \$1000
Filler						3,57
Pennsylvania						
Seedleaf	41	35,363	1,359	48,073	12	5,647
Miami Valley						
Gebhart						
Spanish						
Dutch	42-44	27,475	892	24,517	12	3,064
Georgia, Florida						
Sun Sumatra	45	1,500	1,128	1,691	20	338
Binders					3	
Connecticut Valley						
Broadleaf	51	13,193	1,363	17,986	21	3,819
Havana Seed	52	12,693	1,363	17,173	22	3,781
New York						
Havana Seed	53	1,200	1,146	1,375	19	260
Pennsylvania						
Havana Seed	53	887	1,265	1,123	20	221
Wisconsin						
Southern	54	19,325	1,250	24,160	14	3,481
Northern	55	12,925	1,217	15,726	17	2,747
Wrappers						
Connecticut Valley						
Shade	61	6,223	917	5,844	1.03	5,893
Georgia, Florida				101 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		
Shade	62	2,700	1,128	3,045	61	1,873
Connecticut Valley						
Primed Havana	65	393	1,489	584	29	171

Connecticut Valley, including a small area in the Housatonic Valley, and Wisconsin. Wisconsin has the larger acreage and production of binder tobacco but the yield per acre and the value per pound is less than in the Connecticut Valley. The Connecticut Valley is the largest producer of cigar wrappers, raising twice as much as Florida and Georgia, the only other regions that grow cigar wrappers in the United States. The New England wrapper is also the highest priced and yields the most per acre.

All of the tobacco grown in New England is cigar leaf. Four types are grown, Broadleaf and Havana, also called U. S. types numbers 51 and 52 respectively, of the cigar binder class, and shade and primed Havana, U. S. types 61 and 65, of the cigar wrapper class. The differences between the Havana and primed Havana types are due to methods of harvesting and curing. The table shows that primed Havana is not very important and that it brings much less per pound than the other wrapper types although more than the binder type of Havana.

APPENDIX TABLE 3

Acreage, Production, Yield per Acre, and Price of New England Tobacco

> By Types 1925-1929

U. S. D. A. Yearbooks

			Broo	idleaf			Havan	a Seed	
	Year	Acreage	Yield	Production (1,000 Pounds)	Price (Cents)	Acreage	Yield	Production (1,000 Pounds)	Price (Cents)
1	1925	18,070	1402	25,328	18.9	15,230	1318	20,067	16.1
	1926	12,450	1403	17,462	25.0	10,390	1494	15,527	26.0
	1927	11,450	1309	14,993	21.0	11,800	1324	15,622	23.4
	1928	10,800	1311	14,162	21.0	13,350	1309	17,474	24.0
-	1929	8,300	1453	12,058	27.4	11,600	1509	17,505	31.4
			S	bade			Havana	Primed	
	1925	4,580	1052	4,818	100.0	320	1550	496	21.0
	1926	5,210	1004	5,231	97.7	350	1537	538	35.0
	1927	7,100	900	6,390	105.0	450	1473	663	30.0
	1928	8,000	867	6,936	100.0	450	1422	640	30.0
	1929	8,700	1174	10,218	95.0	200	1575	315	35.0

APPENDIX TABLE 4

Acreage, Yield, Production, and Price of Tobacco Connecticut and Massachusetts

1862 - 1929 (U. S. Department of Agriculture Annual Reports and Yearbooks.)

Connecticut						Massachusetts			
Year	Acres	Yield	Production	Price	Acres	Yield	Production	Price	
1862	5,769	1300	7,500,166	14.0	3,533	1144	4,041,497	14.0	
1863	6,000	1250	7,500,166	25.0	4,333	1200	5,200,000	26.5	
1864	6,828	1450	9,900,218	25.0	4,097	1650	6,760,000	25.0	

APPENDIX TABLE 4 (Continued) Acreage, Yield, Production, and Price of Tobacco

		Conv	ecticut			74	sachusetts	
Year	Acres	Yield	Production	Price	Acres		Production	Price
1865	6,050	1350	8,167,681	30.0	4,7881/3	ESPAIN BY THE OWN	COMPANY OF THE PARTY OF THE PAR	22.5
1866	6,534	1200	7,840,974	19.5	.,, 00/3	1200	5,171,400	20.0
1867	5,263	1266	6,664,000	23.0	3,290	1100		22.0
1868	4,871	1450	7,063,000	25.0	3,200	1300		
1869	4,482	1450	6,500,000	27.0	4,333	1200		23.0
1870	5,996	1250	7,495,000	22.6	4,658	1350		26.0
1871	4,761	1700	8,094,000	25.0	NUMBER OF STREET			
1872	5,052	1650	8,336,000		4,770	1450		20.5
1873	5,220	1647	8,600,000	30.0	4,821	1750		29.5
1874	7,224	1250		23.0	5,620	1459		17.0
1875	6,600		9,030,000	32.0	3,393	1450		28.0
1876	6,203	1500	9,900,000	22.0	6,296	1350	The state of the s	19.0
1877	6,203	1220	7,568,000	9.1	2,835	1640	4,650,000	9.4
	F 000	1.100		11.0				11.0
1878	5,800	1400	8,120,000	11.0	2,700	1600	4,320,000	11.0
1879	6,900	1400	9,660,000	12.0	2,900	1500	4,350,000	11.0
1880	10,070	1538	15,487,660	15.0	3,242	1520	4,927,840	15.0
1881	8,753	1572	13,763,759	16.0	3,291	1520	5,000,964	15.0
1882	8,665	1128	9,772,269	13.0	2,962	1435	4,250,819	12.5
1883	8,145	1176	9,576,824	13.5	2,814	1435	4,038,278	13.2
1884	8,064	1176	9,481,000	12.4	2,730	1361	3,715,000	12.2
1885	7,661	1575	12,066,000	12.4	2,594	1464	3,798,000	12.0
1886	7,292	1600	11,667,000	14.0	2,594	1631		14.0
1887	6,198	1480	9,173,000	14.3	2,464	1425	3,511,000	17.0
1888	6,136	1565	9,603,000	13.0	2,464	1580	3,893,000	
1889	6,259			12.5	2,101	1500	3,023,000	13.0
1890	6,394			16.0				12.0
1891	6,458			19.5				15.0
1892	7,104			21.0				19.5
1893	7,459	1429	10,658,911	14.0	2 (10	1.000	4.1.	26.0
1894	6,713	1127	10,076,711		2,640	1650	4,356,000	16.0
1895	6,579	1509	0.020.000	16.0				10.0
1896	6,579	1550	9,928,000	16.5	1,975	1600	3,160,000	14.0
1897	6,908	1550	10,197,450	13.0	1,975	1620	3,199,500	12.0
1898	0,508							
1899								
1900	10.040	1.001		18.0		5		18.0
	10,948	1684	18,435,765	15.0	4,041	1823	7,367,363	15.0
1901	11,782	1586	18,682,319	15.0	4,284	1810	7,752,200	12.0
1902	12,725	1712	21,785,200	16.0	4,755	1560	7,417,800	15.0
1903	13,234	1600	21,174,000	15.5	4,993	1400	6,990,200	12.0
1904	12,705	1685	21,407,925	22.6	4,444	1690	7,510,360	18.6
1905	13,340	1725	23,011,500	17.0	4,488	1850	8,302,800	16.9
1906	14,140	1735	24,532,900	18.0	4,712	1750	8,246,000	18.5
1907	14,400	1510	21,744,000	11.5		1525	7,167,500	11.0
1908	13,824	1680	23,224,320	17.0	4,512	1650	7,444,800	15.5
1909	16,000	1752	28,110,000	16.5		1730	9,549,000	14.0
1910	16,000	1730	27,680,000	16.5		1730	9,515,000	
1911	17,000	1625	27,625,000	20.5		1650		15.0
1912	17,500	1700	29,750,000	24.1			9,240,000	20.0
1913	18,400	1550	28,520,000	21.0		1700	9,860,000	23.9
1914	20,200	1770	35,754,000			1550	9,455,000	21.0
	22,200	1350	29,970,000	18.5			11,550,000	17.7
1915					8,800	1100	9,680,000	14.5

APPENDIX TABLE 4 (Continued) Acreage, Yield, Production, and Price of Tobacco Connecticut and Massachusetts

		Conn	ecticut			Massa	achusetts	
Year	Acres	Yield	Production	Price	Acres	Yield	Production	Price
1917	24,000	1400	33,600,000	38.4	9,000	1400	12,600,000	38.4
1918	25,000	1500	37,500,000	44.0	10,000	1500	15,000,000	40.0
1919	30,000	1565	46,950,000	46.3	10,000	1540	15,400,000	46.3
1920	30,000	1480	44,400,000	35.0	10,000	1550	15,500,000	40.6
1921	31,000	1454	45,074,000	41.0	10,000	1370	13,700,000	36.0
1922	28,000	1045	29,260,000	40.3	9,000	1068	9,612,000	37.8
1923	29,000	1388	40,252,000	40.3	9,000	1410	12,690,000	34.9
1924	28,800	1370	39,456,000	29.3	9,000	1340	12,060,000	29.8
1925	29,600	1352	40,019,000	26.5	8,600	1243	10,690,000	21.8
1926	21,900	1340	29,346,000	35.6	6,500	1448	9,412,000	35.0
1927	23,700	1223	28,985,000	36.6	7,100	1223	8,683,000	35.7
1928	25,000	1190	29,750,000	37.2	7,600	1245	9,462,000	34.1
1929	20,800	1370	28,496,000	48.0	8,000	1450	11,600,000	42.6

APPENDIX TABLE 5

Acreage and Production of Cigar Leaf Tobacco New England, Pennsylvania, and Wisconsin

1849 - 1929 U. S. Census

	New	England	Penn	isylvania	W	isconsin
Year .	Acreage	Production (Pounds)	Acreage	Production (Pounds)	Acreage	Production (Pounds)
1849		1,405,920		912,651		1,268
1859		9,266,448		3,181,586		87,340
1869		15,870,499		3,467,539		960,813
1879	12,199	19,717,398	27,556	36,943,272	8,810	10,608,423
1889	8,451	11,827,083	26,955	28,956,247	17,241	19,389,166
1899	14,212	23,810,524	27,760	41,502,620	33,830	45,500,480
1909	21,745	37,961,893	41,742	46,164,800	40,458	46,909,182
1919	36,225	56,732,177	42,799	55,965,851	41,465	52,454,246
1924	36,379	49,277,445	44,780	56,353,741	35,027	35,522,305
1929	27,326	37,973,289	40,040	50,584,276	36,602	43,289,644

APPENDIX TABLE 6

Prices of Leading Agricultural Products and Agricultural Labor in Massachusetts by Ten Year Periods

1761-1860

(From 16th Annual Report of Massachusetts Statistics of Labor p. 431 ff, converted into United States standard dollar.)

Years	Tobacco per lb.	per bu.	Oats per bu.	Potatoes per bu.	Rye per bu.	Butter per lb.	Cheese per lb.	Beef per lb.	Agric. Labor per day
1761-1770	.060	.558	.333	.354	.663	.167	.087	.039	.330
1771-1780	.164	.703	.333	.300	1.000	.110	.133	.074	.315
1781-1790	.91	.725	.494	.279	.967	.114	.081	.044	.396
1791-1800	.150	.900	.451	.302	1.140	.185	.096	.047	.478

APPENDIX TABLE 6 (Continued) Prices of Leading Agricultural Products and Agricultural Labor in Massachusetts by Ten Year Periods

Years	Tobacc	o Corn	Oats	Potatoes	Rye	Butter	Cheese	Beef	Agric.
	per lb.	per bu.	per bu.	per bu.	per bu.	per lb.	per lb.	per lb.	Labor per day
1801-1810	.125	1.040	.554	.501	1.270	.213	.140	.084	.779
1811-1820	.304	1.310	.737	.485	1.440	.240	.123	.089	.782
1821-1830	.200	.817	.426	.369	.882	.186	.089	.076	.803
1831-1840	.181	.782	.544	.492	1.030	.220	.096	.081	.875
1841-1850	.226	.721	.545	.783	1.000	.196	.096	.090	.950
1851-1860	.285	.992		.860	1.500	.262	.117	.126	1.010

APPENDIX TABLE 7 Wholesale Price of Leaf Tobacco Boston 1795-1844

(Hayward's Gazeteer p. 392 ff, Tobacco listed as fair. Price per cwt.)

Year	Price	Year	Price	Year	Price	Year	Price	Year	Price
1795	6.87	1805	8.00	1815	7.00	1825	10.00	1835	7.50
1796	7.00	1806	7.50	1816	20.00	1826	9.00	1836	8.00
1797	9.00	1807	8.50	1817	13.00	1827	9.00	1837	7.50
1798	12.00	1808	8.00	1818	12.00	1828	6.50	1838	8.00
1799	10.50	1809	7.00	1819	12.00	1829	4.50	1839	10.00
1800	5.00	1810	8.00	1820	7.00	1830	6.00	1840	
1801	6.50	1811	6.00	1821	6.00	1831	6.12	1841	11.00
1802	7.50	1812	6.00	1822	6.50	1832	5.50	1842	9.00
1803	7.25	1813	5.00	1823	10.00	1833	5.00	1843	8.00
1804	8.50	1814	6.50	1824	10.00	1834	7.00	1844	8.00
Average		Averag	e	Averag	e	Averag	e	Averag	ge
10 yrs. 7	.96	10 yrs.		10 yrs. rage 50	10.35 years 8.15	10 yrs.	6.86	10 yrs.	

APPENDIX TABLE 8

Index Number and Wholesale Prices of Connecticut Wrapper Tobacco

NEW YORK 1851 - 1891 (Aldrich Report, Senate Report No. 1394—52 Congress 2nd Session.)

			P.	rice	
Year	Index Number	January	April	July	October
1851	116.1	16-20	16-20	16-20	16-20
1852	64.5	16-20	5-10	3 1/2-8	5-15
1853	64.5	5-15	5-15	5-15	5-15
1854	74.2	6-20	6-20	5-18	5-18
1855	69.4	5-18	5-18	5-18	61/2-15
1856	95.2	61/2-15	61/2-15	61/2-15	7-221/2
1857	187.1	111/2-35	111/2-35	13-45	13-45
1858	141.9	10-35	9-35	9-35	9-35
1859	116.1	6-25	6-25	6-35	6-30
1860	100.0	10-35	6-25	6-25	6-25
1861	80.6	6-25	6-25	5-20	5-20
1991	80.6	0-25	0-25	5-20	

APPENDIX TABLE 8 (Continued) Index Number and Wholesale Prices of Connecticut Wrapper Tobacco

				rice	
Year	Index Number	January	April	July	October
1862	129.0	5-20	7-25	7-25	10-30
1863	209.7	10-30	20-45	20-45	20-45
1864	290.3	20-45	20-60	25-65	25-65
1865	177.4	25-65	20-40	16-30	15-40
1866	185.5	121/2-45	121/2-45	121/2-45	121/2-45
1867	209.7	30-40	25-55	45-65	20-45
1868	258.1	25-55		15-70	25-55
1869	258.1	35-75	49	35-45	35-45
1870	290.3	36-50	50-75	35-65	40-50
1871	193.5	35-40	35-40	41-45	25-35
1872	161.3	25-35	25-40	20-40	20-30
1873	216.1	20-30	40-55	40-55	22-45
1874	145.2	22-45	22-45	18-30	15-30
1875	112.2	15-30	15-30	15-30	15-20
1876	145.2	15-20	15-22	15-25	15-30
1877	138.7	15-30	14-25	20-30	18-25
1878	153.2	18-25	18-22	18-22	20-27 1/2
1879			18-25	18-25	
1880	153.2	20-27 1/2	20-271/2	20-27 1/2	20-27 1/2
1881	193.5	25-35	25-35	25-35	25-35
1882	141.9	221/2	221/2	. 221/2	22
1883	193.5	20-42 1/2	20-421/2	20-40	20-40
1884	193.5	20-40	20-35	20-35	25-35
1885	161.3	20-30	20-30	20-30	20-30
1886	161.3	20-30	20-30	20-30	20-30
1887	162.9	18-28	18-28	18-321/2	18-321/2
1888	162.9	18-321/2	18-321/2	18-321/2	18-321/2
1889	162.9	18-321/2	18-321/2	18-321/2	18-32 1/2
1890	162.9	18-32 1/2	18-321/2	18-321/2	18-32 1/2
1891		18-321/2			

Appendix Table 9 Price of Connecticut Tobacco in Cents

1845 - 1859* 1910 - 1925**

Year	Price	Year	Price	Year	Price	Year	Price
1845	8.0	1853	8.0	1910	20.5	1918	40.5
1846	7.0	1854	8.0	1911	21.5	1919	38.5
1847	9.0	1855	10.5	1912	21.0	1920	41.0
1848	7.5	1856	21.0	1913	21.0	1921	21.5
1849	9.5	1857	13.0	1914	21.5	1922	28.0
1850		1858	16.0	1915	18.5	1923	29.0
1851		1859	11.0	1916	24.5	1924	16.5
1852				1917	30.5	1925	19.0

*For the years 1845-1859 the prices are averages from prices given in the pages of Anson Bates the property of A. C. Bates the Secretary of the Connecticut Historical Society.

**For the years 1910-1925 the prices are from an unpublished manuscript by A. E. Waugh "A Basis for the Computation of Index Numbers of Farm Products in Connecticut." They are prices obtained from a group of Broadleaf growers on actual sales.

Appendix Table 10 Percent of Area in Important Soil Groups in the Towns of Hartford County*

	Stony		Holyoke	Wethersfield				Merrimac	Merrimac
Towns	Soils	Hinckley	Stony	Cheshire	Manchester	Enfield	Suffield	Sandy Loam	Sand
Von	10.2	8.5	29.1	14.2	16.4			14.7	
Berlin			18.4	38.6	21.2		19.8		
Bloomfield			5.6	41.7		6.1	10.8	27.4	8.4
Bristol	21.9			26.5	15.6			1.7	
Burlington	48.3	4.8		1.3					
Canton	72.2	16.4		9.6					
East Granby			17.1	38.9	9.7	8.1	3.3	3.0	16.1
East Hartford				3.6	1.8	27.8	44.5		
East Windsor				0.9	13.7	16.3	31.9	27.9	
Enfield				18.8	1.5	12.7	17.5	36.3	7.5
armington		3.2	9.2	49.6				15.5	
Glastonbury	52.5	12.5		6.	15.5	5.7		4.3	
Granby	42.5	11.2	9.8	7.3	19.9			10.3	
lartford				19.2		8.	49.4	2.9	
fartland	82.2	6.9							
Manchester	14.7			11.5	65.4	8.4			
Marlborough	81.6	6.9							
New Britain			9.	57.3	38.0		4.1		
Newington			12.4	15.4	54.9	9.	16.7		
lainsville			17.6	19.1				55.8	
ocky Hill				46.8	31.3		2.4		
Simsbury			19.3	19.8	27.2			27.2	
Southington	8.1		10.1	30.7	19.5			5.1	
South Windsor				13.4	16.9	22.4	2.0	39.4	
Suffield			4.1	21.9	3.4	19.2	35.4	12.5	1.4
West Hartford			8.9	62.7	7.0	15.8	5.0		
Wethersfield			1.0	59.5	11.7		3.1		
Windsor				20.4			19.5	24.6	23.3
Winder Locke							, , ,		000

"This table is through the courtesy of Mr. M. F. Morgan, in charge of the Soils Division of the Connecticut Agricultural Experiment Station, New Haven.

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