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Producing And Marketing Flue Cured Tobacco

By
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The Technical Press
Raleigh, N. C.
1941

PREFACE

It is the intention of this book to present some of the practical fundamentals used in producing and marketing flue-cured tobacco. Many bulletins have been published on the various phases of this subject but most of these specialize along some particular line. Each year new information is obtained.

The authors have assembled this information for students and producers interested in the production and marketing problems of flue-cured tobacco.

The authors gratefully acknowledge the assistance and information given by Mr. E. G. Moss in compiling this information; also Mr. H. W. Taylor for the use of the material on marketing flue-cured tobacco; and Mr. W. H. Rogers for the information on the duties of the Agricultural Adjustment Administration as it affects tobacco producers; and Miss Ruth Gardner for her untiring efforts for the assistance given in the construction of the material contained in this book.

INTRODUCTION

About seventy three percent of all the flue-cured tobacco produced in the world is produced in the United States. The Value of this crop ranged from $20,500,000 in 1909 to $172,700,000 in 1939, while the production in 1909 was 222,500,000 pounds and in 1939 it was 1,159,300,000 pounds. North Carolina manufactures a greater volume and a greater value of tobacco products than any other similar area in the world. Its rates of revenue to the Federal Government is the second highest of any State in the union. All of the tobacco in manufacturing plants that are located in the flue-cured area are located in Virginia and North Carolina.

There has been very little information compiled that is available for students in agricultural colleges. The production of tobacco requires skill and experience in order to accomplish it on a profitable basis, therefore, graduates of agriculture need to have more first-hand information when they go out into the field to work with farmers engaged in the production of tobacco. In North Carolina more people are engaged in producing and selling tobacco, and preparing the leaf for manufacturing and in manufacturing tobacco products than any where else in the United States.

The money gained from tobacco not only supports a large number of people; it also plays an important part, directly or indirectly, in the life enjoyed by many of the citizens in the tobacco area. In enters into the support of the development of the highways, railroads, government schools, colleges, universities, churches, and hospitals. Were anything to hamper the tobacco industry, it would strike a vital blow at the progress achieved by more than three million citizens.

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CHAPTER I

THE HISTORY OF TOBACCO FROM THE TIME OF THE DISCOVERY OF AMERICA UNTIL THE PRESENT TIME

The natives were growing tobacco from Canada southward as far as Brazil in the 15th century. Early records show that the Aborigines understood a more fundamental feature of tobacco production as now practiced, including the details of proper spacing in the field, topping, and suckering of plants and the distinctive process of drying now known as air curing, sun curing, and fire curing. The Spanish settlers began commercial tobacco culture in the West Indies, Central America, and South America long before Jamestown was established. In the outset the tobacco produced by the Virginia and Maryland settlers was forced to meet the competition of the Spanish product when sent to Europe. Nevertheless, tobacco promptly became an article of exchange with the Mother country and the culture has remained a prominent feature of agriculture in Maryland, Virginia, and southward. 1/

The Indians thought it a gift from the Great Spirit and attributed to tobacco wonderful medicinal powers. It had a large place too in settling the disputes among the warring nations, for when the pipe of peace was smoked the cessation of hostilities was assured. 2/

Although Jamestown was settled in 1607, it was not until 1612 that the cultivation of tobacco, even in patches of a few plants, was begun among the English settlers. Tobacco was known in England, however, before this time, having been introduced by Sir Francis Drake about 1585, where tobacco taverns soon became nearly as prevalent as ale houses, but its use was opposed strongly by both Church and rulers.

About 1614 so great was the demand that the amount used entailed a national outlay of many pounds of sterling.

The first colonist who was led to make a culture of the weed, which was to exercise such an enormous influence on the history of the United States, was John Rolfe, the husband of Pocahontas. His attention was in a measure directed to it by the fact that he was himself addicted to the habit of smoking, as was Sir Walter Raleigh, who had great influence on its use in England. The cultivation of the plant later in 1617 became so popular that it was grown in the streets of Jamestown and even in the market place. Homer, a writer of this time, who seemed to have had an accurate knowledge of every grade, declared that the colony as early as 1614 afforded a plant equal to that of Trinidad, and as "strong, sweet and pleasant as any cultivated under the sun." He stated further that the people were rapidly acquiring so much knowledge as to the best way of curing it that it must in a short time become as popular in England as the Spanish product.

1/ Information in first paragraph was taken from Tobacco Manufacturing Industry in North Carolina by Dr. Ben F. Lemert, Duke University, Durham, N. C.

2/ Much of the foregoing information in Chapter I was taken from Colonial Virginia - A Story of Tobacco by Mr. W. R. Turner.

By 1616 the knowledge of curing had wonderfully increased. About this time tobacco became the currency of the colonly. The clergy and even fines were paid in tobacco.

In 1619 occurred an event of tremendous importance to the young men of the new settlement. Ninety young and virtuous women were induced by Sir Edwin Sandys to emigrate to Virginia so that the colonists might marry and form domestic ties; the next year sixty more were sent over and quickly found husbands. In all cases the husbands were required to repay to the colony the cost of the passage of their wives from England. This was paid in tobacco, each wife being valued at one hundred and twenty pounds.

Great attention was now given to the growing and cultivation of tobacco, even to the exclusion of other agricultural interests. When Captain John Smith was examined by the Royal Commissioners at the time that repealing the charter of the colony was being agitated, he was asked to explain why it was that the colony, in spite of the fertility of its soil and variety of its natural products, exported but one commodity. His reply was a significant one. The reason, he declared, was that grain brought only two shillings and six pence a bushel while tobacco brought three shillings a pound.

Seven years after the original experiment of Rolfe, a Mr. Lambert introduced a plan of stringing the leaves upon lines, this being the first step in the evolution of the tobacco stick. Tobacco houses were now erected. These houses, where tobacco was taken to be exchanged, were called Magazines, and each Magazine was in charge of a Cape Merchant or custodian. In 1619 one of the provisions adopted by the Assembly provided that such tobacco as was presented to the custodian should be aired before being brought to the Magazine and all which was found to be very mean in quality, when offered, should be burned. This was the institution of the first general inspection law and statutory regulation of tobacco.

The scope of the inspection law of 1619 was in 1623 extended by the appointment of sworn men in each settlement to condemn all bad tobacco. The finest tobacco was known as the long sort which the colonists were esepcially commended to cultivate, all other kinds being strictly prohibited. In 1619-1630 the law restricted the number of plants to be raised to two thousand for every individual in a family, women and children included. In 1633 the number of plants was further reduced to fifteen hundred per person. In 1649 there were about fifteen thousand people in the colonies, exclusive of slaves who were then three hundred in number. In the production it was calculated that the labor of one man would insure twenty or twenty-five pounds of sterling, rating the value of the leaf at three pence a pound.

There were various varieties, the names of some of which persist to this day. Between the sweet-scented and the Orinoco, which represented the extremes in weight, the Orinoco being the heavy variety, there were several kinds, the seed of which bore the names of planters who had given them special distinction. The Pryors, which are cultivated today, were well known as early as the seventeenth century. It is stated that the Indians had several varieties at this period which were unknown to the colonial planters.

No tobacco was allowed to be planted after the 10th of July, as tobacco planted after this time would produce a poor grade called "lugs," a term that was used as early as 1636. Even though the crop was being grown under restrictions it gradually increased, causing a drop in prices. In the period from 1655 to 1662 the average value of a pound of tobacco was barely two pence and when sold in England it brought four pence. In 1664 the amount of tobacco produced in the colonies brought over fifty thousand pounds of sterling. In 1666 the crop was so enormous that it required one hundred vessels to remove only a part of it to England. It was now seen that the colonies were producing as much in two years as England could consume in three, still the crop increased. In 1680 the crop was the largest in the history of the colonies and it was estimated in that year that if not a single plant was set out in 1681 the amount of tobacco on hand would supply the English market for over two years. The deplorable condition was recognized by the people, the Council wrote the English Government advising them of the ruinous prices, and describing the extreme poverty of the colony and imploring relief. This appeal was refused on the grounds that if approved, the area of the plantations in the Spanish, Dutch, and French possessions would be sufficiently enlarged to supply the people of the continent of Europe, and the trade of the Colonial tobacco would be proportionately diminished. After the refusal of the English Government to give any relief, the planters petitioned the Governor to call together an Assembly for the purpose of forbidding planting for a time. This was in the Spring of 1682. The Assembly met and after a stormy debate, which led to nothing, adjourned. A second Assembly was called, but before it convened, a large number of inhabitants determined to make away with tobacco on the hill, a movement known as the Planter Cutters Rebellion. The rioters excused their acts on the grounds that the necessities of the occasion had driven them to desperation. The growing tobacco on one plantation was no sooner destroyed than the owner, having been deprived of his crop, was seized with the same frenzy and went with the crowd as it marched to destroy the crop of his neighbor. The rebels were careful to destroy the sweet-scented variety as it grew only in this part of Virginia. The rebellion was finally suppressed by the militia after great damage had been done in the tobacco growing section of Virginia. Due to the destruction of practically the entire acreage, prices began to improve and in 1694 the inhabitants were contented and peaceful.

In the years of 1632-1633 five different inspection warehouses, in charge of a Cape Merchand or custodian, were ordered at James City, Shirley Hundred Island, Denbeigh, Southampton River, Elizabeth City and Cheskiack, all of which were in Tidewater where the greater part of the crop was grown. All of the tobacco produced was to be brought by the planters to these tobacco houses by the last of December of each year, and all the meanest grades were taken and destroyed, the remainder to be taken and stored until such time as it could be shipped to England.

Special Legislation was enacted between 1675 and 1686 to insure excellence in the construction and size of hogsheads, this being necessary to keep them from falling apart when rolled to market, the first method used in transporting tobacco on land. This legislation also prevented the planter from cheating the buyer by making the hogshead of thicker wood than authorized.

Severe penalties were inflicted for the violation of this law. Every stave was to be one-third of an inch in thickness, and timber from which it was made to be of dry and seasoned wood, usually of oak. The hogsheads were required to be forty inches in height, measuring by the stave, and thirty inches in the drain of the head. The gross weight of a full cast was to be four hundred seventy-five pounds.

Up to the early part of the eighteenth century the tobacco had been grown almost exclusively in the tidewater sections of Virginia, and shipped by water direct to England who had a monopoly on the trade. As the population began to expand westward it was found that tobacco grown in the higher country produced larger and richer plants. This presented a great difficulty in getting it to the market. As long as the population followed the streams the problem was not so acute, later, as the course of civilization opened up, the back country roads were established which at first were very poor indeed, being the outgrowth of bridle paths. These roads were covered with dust and full of deep ruts during the summer and knee deep in mud in the winter; therefore, it was difficult to find a suitable time of the year in which to market the crop. As it was necessary to deliver tobacco to warehouses as it is today, planters who did not live on or near streams had to devise some method of transporting their crop to market. The first method used was rolling the hogsheads from behind. It was done by slaves or other laborers. This method was so slow and unsatisfactory that it was soon abandoned. The next method was to put a metal axle through the hogshead and harness oxen or mules to it. This had to be discontinued because the axles injured the tobacco.

In Howe's History of Virginia, the following account is given of how the problem was finally solved. "The tobacco was formerly not transported in wagons as at present, but by a much simpler process; the hogshead in which it was packed had a wooden pin driven into each head, to which were adjusted a pair of rude shafts, and thus in the way of a garden roller it was drawn to the market by horses. Those who followed this business of tobacco-rolling formed a class by themselves, hardy, reckless, proverbially rude, and often indulging in coarse humor at the expense of the traveler who chanced to be well-dressed or riding in a carriage."

After the Revolution when the markets of the world were opened to the United States, tobacco production increased enormously and with it the number of slaves. Production almost ceased in Tidewater, and the finest and best tobacco began to be produced on the Southside, thus moving southward to where it is being produced today.

The period between 1781 and 1861 has often been called the "Golden Age in Virginia." The planters had large farms and many slaves. It was during this time that everyone entertained with a lavish hand and his hospitality was unexcelled. No where were the wishes and wants of the guest more regarded and in no section was the character of a true gentleman held more sacred. Even though they indulged in horse-racing and cock-fighting, they held to the standard that a gentleman's word was as good as his bond.

The system of marketing tobacco now underwent a change. The tobacco was prized and put in hogsheads by the planter in keeping or shipping order, and every plantation was equipped with a price barn. None was sold loose on the open warehouse floor as at the present time. The hogsheads on arrival at the warehouse were inspected, and a sample taken to the tobacco exchange where it was sold from the sample at auction. A good description of the market in 1845 is given in "Recollections of Captain Richard Irby," a planter of Southside, Virginia, who sold his tobacco in Richmond. There being no railroads, he sent his tobacco to Petersburg by wagon and from there to Richmond by train. His account follows:

"It was my first visit to Richmond. I went to Petersburg on horseback and thence to Richmond by rail, making the first travel by rail I ever made. Along with me were several fine friends who had never been on a railroad before, to all of us it was a great experience. The train took an hour or more to make the trip, a distance of twenty-two miles. The object of my visit to Richmond was to sell a part of my mother's crop of tobacco. It was sold at Shocco Warehouse in the City. The inspectors were Shepherd and Williamson, the former the active manager, and the latter the cashier. The most of the tobacco was sold at auction, the crier (auctioneer) sitting on one end of a long table. He would read the number of the sample, and then pass it down for the examination of the buyers, who were arranged along on both sides of the table. At the end opposite the crier sat one of the largest buyers in the State, a venerable man, and one who was highly respected then, and all his life, for his high character and business integrity. This was Mr. John S. Caskie. His brother James and he were among the leading merchants of the city and state, Scotchmen by birth or near descent. I was impressed particularly by Mr. Caskie's liberal way of trading, going at once up to what the tobacco was worth. I think he bid three dollars more than another had bid and no one advanced on his offer, as this was what the tobacco was worth. Old Captain Shepherd was specimen of the old time gentry. He wore a queue and knee pants and stockings. He was quite demonstrative. I recollect that there was a planter from my county whose tobacco was in a case which exceeded the limit in height and its weight was largely over the average. The Captain scolded a good deal about it, and told the man he had cheated the wagoner, the railroad and the inspector, - the hauling, inspection, and commission all having been by the case and not weight. I received from my sales about one hundred dollars per hogshead, and I handled for the first time over a thousand dollars, all of which was paid in money and not by check."

Along about 1852 two farmers, Eli and Elisha Slade, Caswell County, North Carolina, not far from Danville, Virginia, noticed a different type of leaf in a spot of sandy soil on their farm. After curing the tobacco by indirect heat instead of by direct fires as tobacco had been cured prior to this time, they found that they produced a bright, yellow leaf that was exceptionally mild with a very sweet flavor. Before this time a light colored sweet leaf had been produced and was cured by fire being placed in the barn as is done in the dark fired section of Virginia today. After this discovery by the Slades this type of tobacco became popular locally at once. As other farmers tried to produce it they found that it was almost a new type of leaf that could be produced only upon the soils of light texture with high sulphur contents. Much of the land around Caswell County was covered with this type of soil. The production of this new, bright yellow leaf spread

rapidly throughout the northern piedmont counties and to the south central portion of Virginia, thus the beginning of what is known today as flue-cured tobacco. This area became known as the "Old Bright Belt." Some years later the production of the bright yellow tobacco spread into central eastern North Carolina, that area taking the name of the "New Bright Belt." The culture of tobacco continued to spread until it extended into eastern South Carolina, central coastal plain section of Georgia, northern Florida, and a small portion of Alabama. 1/

1/ Phrases from Tobacco Manufacturing Industry in North Carolina by Dr. Ben F Lemert, Duke University, Durham, N. C.

CHAPTER II

TYPES OF FLUE-CURED TOBACCO

Bright flue-cured tobacco is classed into four types; numbered 11, 12, 13, and 14. North Carolina produces one hundred percent of type 12, seventy-five percent of type 11, forty percent of type 13, and none of type 14, which is grown in Georgia, Florida, and Alabama. During the last decade burley tobacco, type 31, has been increasing in the western part of North Carolina in the mountain counties, however, as yet, it still produces only two percent of the nations supply of burley while it produces about sixty-eight percent of the national supply of flue-cured tobacco. Virginia produces about nine and seven-tenths percent, South Carolina about eleven percent, Georgia about nine percent, Florida about one and six-tenths percent, and Alabama about seven-tenths percent.

Flue-cured tobacco, type 11, is grown principally in the Middle and Old Belt which is composed of the flue-cured area of Virginia and the Piedmont counties of North Carolina. Flue-cured tobacco, type 12, is produced entirely in the Coastal Plain Section of North Carolina, north of South River, and is known as the "New Bright Belt." Flue-cured tobacco, type 13, is produced in South Carolina and the southeastern counties of North Carolina, south of South River, which is known as the "Border Belt." Flue-cured tobacco, type 14, is produced in the southern section of Georgia, northern Florida, and southern Alabama, which is known as the "New Belt of Georgia and Florida."

These types get their distinction from the area in which they are grown due principally to the climate and soil conditions in which they are produced. Type 11, produced in Virginia and the piedmont counties of North Carolina, is a heavier, richer colored tobacco than any of the flue cured types. The leaf which is usually thicker and heavier is due to the soil type we have in North Carolina and Virginia and also to the climatic conditions. This belt is the fartherest north, which naturally makes the growing season a little shorter and as a result the tobacco is as described above with a majority of it an orange color. However, there is some lemon colored tobacco produced on the lighter soils of this area while on some of the heavier clay types of soil some red or mahogany colored tobacco is produced. The southeast portion of the area in which type 11 is produced is known as the "Middle Belt." The tobacco produced in the Middle Belt is of a lighter texture and the color is the same as that of the Old Belt but does not have quite as rich or deep color as that in the Old Belt. Usually there is more tobacco produced of a dark red or a walnut color in the Old Belt than in the Middle Belt. The tobacco is not as thick as that of the Old Belt. Type 12 differs from that of type 11 in that it is of a lighter color and has a thinner textured leaf; the color is principally yellow and orange as that of type 11. The color, however, is a lighter color than type 11 and what might be considered an orange color in type 12, might be considered a lemon color in type 11. The growth of type 12 is usually larger than that of type 11 and the yield per acre is usually some greater. The difference is due to soil types and climatic conditions. A majority of type 12 is grown on sandy loam soil, principally Norfolk sandy loam and is a little

farther south which would give it a little longer growing season and a little warmer temperature. This would naturally cause the difference in the two types.

Type 13 does not differ as greatly from type 12 as type 12 from type 11 in that it is grown principally on the same soil type where the temperature is practically the same. However, generally, the tobacco is of a little lighter color than either type 11 or 12 and the texture is also thinner.

Type 14 differs from either of the other types in that it grows farther south where the growing season is longer and the temperature is warmer and as a result the tobacco is of a lighter color and texture.

CHAPTER III

VARIETIES 1/

There are numerous varieties of flue-cured tobacco grown in the flue-cured belts. Some of them are as follows: Virginia Bright Leaf, White Stem Orinoco, Bonanza, Jamaica Wrapper, Yellow Mammoth, Gold Dollar, Mammoth Gold, Cash, Four Hundred, Big Jim, Hickory Pryor, Bottom's Special, Lizzard Tail, Willow Leaf, Faucette's Special, Bell's Improved Gold Dollar, Harrison's Special, and others that are not as popular as the above mentioned varieties. Of this group there are several varieties that are recognized as standard varieties and are recommended by the Tobacco Experiment Stations in North Carolina, the North Carolina Extension Service, and the North Carolina Crop Improvement Association. The standard varieties are Virginia Bright Leaf, White Stem Orinoco, all strains of gold Dollar prior to Strain Eight, Bell's Improved Gold Dollar, Jamaica Wrapper, Cash, and Bonanza. All of these varieties are eligible for certification in North Carolina by the North Carolina Crop Improvement Association.

For the coastal plain section Bonanza, White Stem Orinoco, Bell's Improved Gold Dollar, Virginia Bright Leaf, Gold Dollar, and Jamaica Wrapper are all well adapted, however, some of these varieties are better on some soils in the coastal plain section than others. It has been observed that the various varieties of tobacco are very sensitive to different soil types in different localities and to different crop rotations. Even with these variations there may be other varieties that are not mentioned that will do even better under some conditions than will the recommended varieties. The varieties that have proved to give satisfactory results on the piedmont soils are Cash, Jamaica Wrapper, Virginia Bright Leaf, Gold Dollar, and Bonanza. The same being true with the piedmont soils as to the adaptation of varieties as that of the coastal plain soils. It has also been found that in some instances on the piedmont soils that the varieties that are not recommended will give excellent results. All of the varieties recommended have been carefully bred and selected for cigarette type tobacco, careful consideration having been given to the width and length of the leaves.

A brief description of the standard varieties and a few other varieties will be given as follows:

(1) The Virginia Bright Leaf variety is an excellent cigarette variety and is well adapted to both coastal plain and piedmont soils. It normally has a medium width leaf of reasonable length where good practices are used, and usually ripens uniformly, thereby producing a good crop of tobacco. The yield will vary according to the seasons with an average yield from about eight hundred to nine hundred pounds per acre. It reaches maturity about the same time that most of the other varieties do. The leaves are well-spaced but moderately wide apart on the stalk.

1/ The description of some of the varieties described was taken from the bulletin, Flue-Cured Tobacco Varieties, by Mr. E. G. Moss and Mr. Jas. F. Bullock, Oxford Experiment Station, Oxford, N. C.

(2) White Stem Orinoco usually produces better quality tobacco on thin or poor soils. It usually produces a fiar yield of good quality tobacco. The leaves of the plant are about two-thirds as broad as they are long and are spaced closely on the stalk. The tips of the leaves are usually pointed. When produced on fertile soil, White Stem Orinoco is coarse and the leaves do not ripen uniformly.

(3) The Jamaica Wrapper variety does well on both piedmont and coastal plain soils, however, it is more of a richer type of tobacco having a medium, broad, long leaf that grows with a yellowish cast, frequently causing it to be harvested before it is ripe. The leaves are well-spaced on the stalk which enables them to ripen uniformly from the tip to the butt of the leaf. The yield is usually good when normal weather conditions are prevalent.

(4) Bonanza usually produces good quality on loamy type soils and reaches maturity a week or ten days before other varieties do. It has a leaf that is broad near the base and tapers to a sharp point at the tip. When cured it has a lemon color of high quality. The yield is comparable to that of Jamaica.

(5) Gold Dollar is the most popular variety at the present. It is a selection of Jamaica Wrapper, an excellent variety, and is well adapted to a number of soil types. It is much the same as its parent Jamaica except that the leaves are broad. This variety is comparatively new and usually produces an excellent export type of tobacco. It was originated at Coker's Pedigreed Seed Farm, Hartsville, South Carolina.

(6) Due to the habit and growth of Cash it is not popular in the coastal plain section particularly where tobacco is grown on loose sandy soils. On the other hand, where the land is of a heavy type and the tobacco is cultivated on a ridge, this variety which is principally produced in the piedmont sections of Virginia and North Carolina gives excellent results. It has been observed that the seed germinates earlier than other varieties. Cash is also one of the early maturing varieties similar to that of Bonanza.

(7) Mammoth Gold is another variety originated at Coker's Pedigreed Seed Farm and is a cross between Yellow Mammoth and Gold Dollar. This variety was produced first in 1939. The yield and quality is fair and it is adapted to most of the various soil types in the coastal plain sections and to the sandy soil types in the piedmont sections. It has a leaf of medium width, length, and while growing, somewhat of a yellowish cast.

(8) Yellow Mammoth when produced on a soil type to which it is adapted is unexcelled for a yield, quality, color, and texture standpoint. The reason that it is not recognized as a standard variety is due to its inconsistency on various soil types and to its curing quality. It grows with a yellowish cast with leaves of medium width and length. Many growers have difficulty in curing it due to the fact that when the heat is raised to the coloring stage from the drying stage it requires from three to four hours longer than the average variety. If this precaution is not taken the leaves usually have a blue butt.

(9) Four Hundred is a variety originated at the Oxford Tobacco Experiment Station, Oxford, North Carolina, and is a cross between Big Jim and Silk Leaf. It was origirated because of its resistance to Black Root Rot (Thielaviopsis Basicola), a disease prevalent on some of the tobacco soils principally in the piedmont area. It is not being recommended as yet by the Tobacco Experiment Station due to the fact that the ageing process with the commercial interests has not been completed. It grows larger than any of the other varieties and produces excellent quality and growth, having very broad, long leaves, with medium size stems and fibers.

There are other varieties that are not described that will give satisfactory results in some cases, however, they have similar characteristics of some of the above mentioned varieties. It is not a good policy to recommend any variety of tobacco to a grower who has a variety that is giving good results until he has tried the new variety on a small scale; and then if it proves better than what he is using, it is well to try the new variety. On the other hand, if the grower is not getting satisfactory results from the variety that is being grown, it is usually safe to recommend one of the standard varieties based upon the description given above, taking into consideration the soil type and fertility.

CHAPTER IV

PLANT BEDS

It is necessary to give careful consideration to the location, soil type, and drainage of plant bed sites. Plants are the foundation of the crop, whether they are good or poor, and only where the best practices possible are given to plant beds can the best plants be produced. The plant bed should be located on a well-drained soil with a southern or southwestern exposure. It is necessary to keep it as warm as possible in order that the plants may be given every advantage to grow in a thrifty condition. With this exposure it will give more hours of sunshine during the day than any other exposure that could be selected. It is advisable to have several small beds instead of one or two large ones. This will help to eliminate disease hazards.

The soil should be of a loamy type, high in organic material with a pH reading of 5.6. It is a good practice to locate plant beds on virgin soils. This will eliminate the danger of diseases being carried over from old sites and will also eliminate a lot of unnecessary hand picking of weeds and grass.

Careful consideration should be given to the preparation of the soil. All roots, small stumps, and any form of undecayed vegetative growth should be removed. The soil should be disked and plowed, thoroughly pulverizing it. It is also advisable not to break the soil too deep, usually about four or five inches is sufficient. After the soil is pulverized, it is necessary to rake it, clearing it of any additional roots and undecayed vegetative growth that might have been plowed up when pulverizing, and also to get rid of any lumps or clods that might be present.

Another precaution that is advisable to follow is the sterilization of the seed beds. The most practical way at the present time for sterilizing them is the old method known as "burning the beds." This is done by placing heaps of brush and wood on the site where the bed is to be sown and burning this material. This method of sterilization will help to eliminate a large percentage of weeds and grass that might be present, and also help to reduce soil-born diseases.

The most effective method of sterilization known is the steaming method but due to the cost of the equipment it is not altogether as practical for the average tobacco grower as the burning method. The equipment to do this job efficiently costs approximately $1000 to $1200, however, equipment of this type could be used on a cooperative basis and could serve several growers in any given community. The equipment necessary for this is a steam boiler of a portable type similar to that used by saw mills. Pans that are approximately six feet square are placed over the same size area of soil, and steam is allowed to go from the boiler to this pan, for about thirty minutes, which comes in direct contact with the soil. This is usually sufficient to take care of any weed or grass seed that might be present and any soil-born disease.

One other method of sterilization that is in its infancy is the use of Aero Cyanamid. This is a nitrogen lime material analyzing twenty-one percent nitrogen and seventy percent calcium which has a toxic effect upon the soil and will kill the germination of weed and grass seed that come in direct contact with it. It is necessary to apply this material from sixty to ninety days before the bed is to be seeded in order that its reaction to the woil will be over with before the tobacco seed are sown, thereby avoiding interference with the germination of the tobacco seed. The best method of application is to thoroughly pulverize the soil and then apply three fourths of the total amount to be used uniformly over the bed. By means of a harrow or cultivator, or some implement of this type, thoroughly work it into the top four inches of the soil. After this is done the soil should be smoothed with a garden rake and then apply the other one-fourth on top of the soil and leave it in order that it might come in contact with weed and grass seed that might be blown upon the bed. When seeding time comes it is necessary to work in the top two inches of soil, working the fertilizer in as this operation is performed. If the soil is worked much deeper than this there is a possibility of bringing to the surface some weed and grass seed that the treatment did not kill.

It has been found that one pound of Cyanamid per square yard gives the most satisfactory results. In all cases the granular form should be used in preference to the pulverized form. The same analysis and rate of fertilizer should be used when this treatment is given as in any other treatment. This treatment is not recommended as yet due to one danger that is subject to take place from it and that is the alkaline condition which the calcium might cause the soil to have. Usually where an alkaline condition is present Black Root Rot is subject to be present. This disease is only active in alkaline soils, however, most of our plant bed soils are highly acid and in the demonstrational and experimental work that has been conducted to date there has been only one or two instances where this condition has arisen. Before this method of sterilization of plant beds is approved or disapproved more demonstrational and experimental work will be conducted.

It is necessary to fertilize plant beds with the best grade of plant bed fertilizer that can be obtained. Oftentimes low grade fertilizer causes a failure in the production of plants at the proper transplanting time. Two pounds per square yard of a 4-8-3 plant bed fertilizer is recommended. The fertilizer should be made up on the following basis: One-fourth of the nitrogen should come from nitrate nitrogen; one-fourth from other standard inorganic sources, preferable sulphate of ammonia; and the other one-half should come from organic nitrogen of plant or animal origin. The phosphate should be derived from sixteen or twenty percent superphosphate or its equivalent. The potash should come from sulphate of potash or sulphate of potash magnesia. It is necessary for plant bed fertilizer to contain the minimum amount of chlorine. Chlorine is very injurious to young tobacco plants in that it makes them brittle and tender, which gives them a very poor chance to live when transplanted to the field.

The fertilizer should be uniformly distributed on the bed and worked into the top three or four inches of soil with some implement that is suitable for this operation. Under adverse weather conditions it may be necessary to use some additional fertilizer in order to prevent the plants from becoming

stunted. Many growers rely upon nitrate nitrogen which in many instances is undesirable in that it produces a sappy, tender plant that will not withstand the shock from transplanting to the field under a hot temperature. Where additional fertilizer is necessary it is advisable to use from one to two pounds of nitrate nitrogen mixed with ten pounds of dried blood and twenty pounds of cottonseed meal applying this to one hundred square yards when the plants have approximately four leaves formed. Caution should be taken to apply this material when plants are dry, preferably in the middle of the day. Many growers use cottonseed meal entirely which is an excellent source of organic nitrogen, however, where soils have a tendency to crust or harden, cottonseed meal seems to cause this condition to be worse than would fish meal. Where fish meal is used it is necessary to use only half the amount that would be necessary if cottonseed meal was used. If the soil is a light sandy type, it is advisable to use a good covering of hog pen manure provided the hog pen has been littered with pine straw or well thrashed wheat, oat, or rye straw. If any material has been used to litter the hog pen that contains weed or grass seeds, the manure should not be used. When the manure is used it should be thoroughly worked into the soil.

The most satisfactory way to apply seed on the bed is to mix thoroughly the amount of seed to be sown with about two gallons of fertilizer or cottonseed meal to make a good carrier, so that it will make possible a more even distribution of seed. After the seeds are sown the soil should be packed lightly. The method most commonly used is to attach a board to a wooden maul so as to pack the soil evenly over the entire bed. The quantity of seed necessary to sow one hundred square yards is one level tablespoonful. Many producers sow more than this but if the seed are sound, usually the plants are so thick that they grow slender and do not give the best results when transplanted. There are about three tablespoonfuls to one ounce of tobacco seed and from 350,000 to 400,000 seed to the ounce.

After the bed has been seeded it is important to cover it with a cotton canvas, 28 x 32 threads to the square inch. The old way of covering beds was to place poles four to ten inches in diameter around the border of the bed and then attach the canvas to them. In the last few years this method has been changed considerably due to the diseases and insects that affect the plants in the bed. Blue Mold (Downy Mildew) has been the most serious of any disease affecting the plants in the beds. This has been overcome by treatments that have been worked out by the pathologists and in so doing it has required a different construction for the bed than that previously used. The best construction that can be used to give satisfactory protection to the bed is to box the bed with planks, allowing them to extend approximately six inches above the soil. This will necessitate the use of planks or boards eight or ten inches wide. It is necessary to put from two to four inches of the bottom side of the board into the soil in order to keep water from washing under the board or allowing any space for insects or diseases moving into the bed. When the fumigation method for treating Blue Mold is given it is also necessary to have these boards as nearly air-tight as possible so that the fumes or gases may be held within the bed. When placing these boards around the beds they should be jointed very closely so that no air passages will be left in the joints. If no treatment for diseases or insects is to be used, it is not absolutely necessary to use either poles or boards to hold the canvas on the beds.

Many growers throughout the tobacco sections find that the use of from twenty to twenty-five pounds of well thrashed wheat, oat, or rye straw scattered uniformly over one hundred square yards of bed space will keep the bed much warmer than if this is not used. When the straw method of covering is used, the canvas may be anchored in direct contact with the straw without any poles or boards. This method of covering will usually cause the seed to germinate approximately ten days earlier than they normally would under the average seasonal conditions. It will also prevent the seed from being beaten into the ground by heavy rains and at the same time it will help to keep the top of the soil moist. The principle involved in this method of covering is identical to that of a person lying in bed on a severly cold night with the cover raised six inches above his body.

CHAPTER V

SOILS MOST SUITABLE FOR GROWING FLUE-CURED TOBACCO

The success of a profitable tobacco crop is largely dependent upon the weather conditions and soil. There are numerous soil types in the flue-cured area on which tobacco is being grown. However, the most satisfactory soils are the loamy types, whether they be in the coastal plain section or in the piedmont section. On the other hand there is also some good quality tobacco produced on other soil types. The consistency of tobacco crops on other soils is not as good as it is on the loamy soil. On an average only one good quality crop out of four will be produced on soils other than the loamy type. In the piedmont section tobacco is grown on Durham sandy loam, Cecil clay loam, Appling loam, Helena loam, Granville sandy loam, Surry and Davidson types; and in some instances, you will find tobacco being grown on Davidson and Cecil clays but the quality is usually very poor. In the coastal plain section most of the tobacco produced is on Norfolk sandy loam, however, there are a number of other soil types where tobacco is grown such as Marlboro sandy loam, Craven sandy loam, Onslow sandy loam, and others. Tobacco has been grown most satisfactorily on the following types: Norfolk sandy loam, Marlboro sandy loam, Durham sandy loam, Granville sandy loam, Cecil sandy loam, and Appling sandy loam.

The soils in the coastal plain section usually have a gray top soil, about six or eight inches deep, with a yellow friable subsoil, and frequently a plastic clay is found beneath the yellow friable subsoil. Most of these soils are composed of fine sand and natural organic matter.

Practically all of these soils are well drained, which is an essential factor in the production of quality tobacco. In some sections they are drained by means of ditches while in others they are drained by means of terraces. To get the full advantage of the soils drained by terraces, it is advisable to run the rows with the terraces.

Piedmont soils on which the best tobacco is produced has a coarse, sandy top soil. The top soil is usually gray in color with a friable subsoil. Many soils where tobacco is grown are very compact and lifeless due to the cropping system that has been practiced on these soils, along with a poor system of drainage. In many areas of the tobacco section on piedmont soils there has not been any method of drainage and the soils are badly eroded. In the past seven or eight years many producers have taken an interest in the drainage of the soils and as a result farms have been terraced with adequate outlets. This has been a great help to the tobacco producers who have rolling soils, in that it has prevented erosion to a large extent and is gradually improving the fertility of the soil.

The best quality of tobacco is usually produced on soil that has a medium amount of decayed organic matter. On soil that contains a high amount of leguminous organic matter, special consideration should be given to the method of fertilization. It is observed throughout the entire tobacco area that the average tobacco grower produces the best quality tobacco on soils with a limited amount of leguminous organic matter.

CHAPTER VI

COVER CROPS AND ROTATIONS

Tobacco will withstand adverse weather conditions much better on soils where a reasonable amount of vegetation is turned under in a rotation with other crops. In extremely dry weather vegetation will preserve moisture which will enable the plants to withstand the hot drying sun that usually goes along with dry weather much better than will a depleted soil. In extremely wet weather the vegetation will absorb the surplus moisture preventing it from coming in contact with the plant and causing it to be stunted by excessive moisture. On many of the tobacco farms, the land suitable for growing tobacco is not sufficient to follow a definite rotation and in these cases the growers are forced to put tobacco on the same land every other year and in many instances every year. Where this is done it is advisable to turn back into the soil all the possible growth from stalks that have been produced by the previous crops, and certainly winter cover crops, such as rye, oats, or Italian rye grass, should be grown and turned under in the spring preceding the tobacco crop. In traveling over the tobacco area one will observe that many of the farmers will pile and burn all corn, cotton, and tobacco stalks, and even in some instances growers will grow a soil conserving crop such as soybeans, crotalaria, and peas and then in the spring of the year will cut and burn it, thus robbing the soil of all of its natural organic matter. As a result of this the soil is left in a very depleted condition. The soils gradually become more depleted from year to year as the people dwelling on farms of this type are forced to move from one farm to another because of financial difficulties, thus the soil is robbed of its fertility before crop rotation can be put into effect. Tenant farmers, as a rule, are more inclined to follow this practice than any other class or group of farmers. It has been said by leaders in agriculture that "they have never seen a farmer lose his farm or seen it sold for taxes where a rotation was followed, using soil-conserving and soil building crops in the rotations."

Cover crops that are most suitable to precede tobacco are rye, Italian rye grass, and oats, the two latter being the most desirable. It has been observed that Italian rye grass and oats develop a greater rooting system and better turf than does rye and are not as hard to destroy and get turned back into the soil as rye.

Rotations give the tobacco grower an advantage for which there are no substitutes. Rotations on a tobacco farm will improve the soil, add organic matter, enable the plants to withstand adverse weather conditions, will lessen the damage done by diseases affecting tobacco, and will in some instances do away with the diseases present to the point that the tobacco can be produced on a profitable basis in spite of the fact that the diseases are present. It will also be found that by following a definite rotation system that soon after the rotation is started a surplus of food and feed crops will be produced on the farm that will enable additional livestock to be maintained and a substantial food supply for all of the people living on the farm. Rotations that are suitable for tobacco farms are as follows:

Two-Year Rotation:

First Year: Tobacco followed by winter legumes.

Second Year: Cotton, peanuts to be harvested, or corn planted alone.

Three-Year Rotation:

First Year: Tobacco.

Second Year: Small grain crop interplanted with winter legumes, or corn interplanted with summer legumes.

Third Year: Cotton, peanuts to be harvested, or corn planted alone.

Four-Year Rotation:

First Year: Tobacco.

Second Year: Small grain interplanted with herds grass and lespedeza.

Third Year: Allow herds grass and lespedeza to reseed.

Fourth Year: Cotton, peanuts to be harvested, or corn planted alone.

In areas where crops listed in the above rotations are not suitable, other crops may be used that would be practical and adaptable to any given locality.

CHAPTER VII

PREPARATION OF THE SOIL IN THE FIELD

One of the factors that the profit above the cost is dependent upon is the preparation of the soil for planting. A very sound statement has been made by many successful farmers and that is "when the soil is well prepared and the crop planted -- the crop is half made." The way in which the soil is prepared is usually about the way a crop will grow. If the soil is well prepared a good crop can be expected, provided favorable weather conditions prevail. Poorly prepared soil usually results in low yields and inferior quality plants.

For the most successful results in preparing soils for tobacco, the following procedure should be used:

First: The stalks of the preceding crop should be cut in the fall of the year and the land thoroughly disked and broken with a two-horse plow so that all forms of vegetation present will have an opportunity to decay. This, too, causes many of the insects and harmful disease organisms to freeze during the winter.

Second: The soil should be broken again four to six weeks prior to planting time in the spring of the year. After each rain the soil should be harrowed with a smoothing harrow, which will eliminate a crusting or baking condition and at the same time preserve moisture. This practice should be followed until the rows are marked off.

CHAPTER VIII

FERTILIZERS

In the last fifteen or twenty years there has been a great change in the demand for flue-cured tobacco; therefore, it was necessary to make certain changes in the fertilizer for tobacco. This change has been brought about as a result of the work done by those engaged in tobacco research, experimental and demonstrational work. At the present time tobacco growers are able to purchase from commercial concerns the best fertilizers ever produced in the history of tobacco production. 1/

At the present time practically all of the fertilizer companies are manufacturing a good, reliable, well-balanced fertilizer that is built to suit the habit of the tobacco plant. Most of our tobacco soils have a pH reading from 5.0 to 6.0. Tobacco usually produces better quality on soil with a pH reading of 5.6, and most of our fertilizers are manufactured so that they will meet the needs of a tobacco soil having a pH reading of 5.6, however, there are some variations from this.

It has been found that on light or less productive soils that from 800 to 1200 pounds of a 3-8-6 tobacco fertilizer gives satisfactory results. On the heavier or more productive soils it has been found that from 800 to 1000 pounds of a 3-10-6 gives excellent results. On coastal plain soils it is advisable to use a 3-8-6 and in many instances where the soil is in a high state of cultivation a 3-10-6. On piedmont soils it is advisable in all cases to use a 3-10-6 in preference to a 3-8-6. In some instances on piedmont soils it is advisable to use a 2-10-6 at the rate of 800 to 1000 pounds per acre in preference to a 3-10-6. This would also be true on many tobacco soils in the flue-cured belt where tobacco for some reason had to follow a legume crop with a heavy growth. All experiments and demonstrations have indicated that the above analysis and rates will give more profitable results than will lower analysis or low grades of fertilizer. Tobacco is a very sensitive and delicate plant so far as its feeding habits are concerned. It demands a well-balanced plant food and when 1000 pounds of a 3-8-3 fertilizer is used, the nitrogen over-balances the amount of phosphate and potash used, thus making an unbalanced condition in the source of plant food. The results that might be expected from this are too much nitrogen, not a sufficient amount of phosphate and potash, and poor quality tobacco.

The most essential plant food elements for producing tobacco are: nitrogen, phosphorus, potassium, calcium, magnesium, chlorine, sulphur, manganese, boron, and a number of minor elements. The functions of these elements are as follows:

(1) Nitrogen promotes growth and produces the framework or size of the plant.

(2) Phosphorus promotes root development, leaf development, and uniform ripening conditions.

1/ See Table No. 4.

(3) Potassium gives added quality and texture, more uniform ripening conditions, and lessens the damage done by certain leaf spot diseases.

(4) Calcium gives added quality and a more firm leaf.

(5) Magnesium produces a normal color and prevents a bleached appearance in the leaf which results in poor quality.

(6) Chlorine not used excessively produces tobacco with a broader leaf spread and cures brighter in color.

(7) Sulphur is essential in producing tobacco in that it gives the plant a smoother finished leaf.

(8) Manganese might be considered as one of the minor elements necessary in tobacco production. It also gives the leaf a firm texture.

(9) Boron also might be considered one of the minor plant food elements in tobacco production and its function is to aid the development of normal leaf veination and growth. A very small amount of this element is required.

When an excess amount of the above elements is available to the plant, it has an injurious effect which is described as follows:

(1) Nitrogen produces a deep green plant with bony stems and fibers and when the leaf is cured it is very thin and lifeless with a deep orange color.

(2) An excess amount of phosphorus will produce a green leaf and will prevent ripening as well as retarded growth.

(3) When more than from twelve to fifteen percent of potassium is used, it has an unfavorable reaction upon the leaf in that when the leaf is cured it is not as clear in color and is lacking in quality. The butt of the leaf usually has a deep brown or slaty color.

(4) An excess amount of calcium will give very similar results to that of an excessive amount of potassium. Too much calcium will also cause soil reactions that are favorable for certain diseases, such as black root rot.

(5) When an excessive amount of chlorine is used, it produces a brittle cabbage-like leaf with a deep green glazed appearance and with the margin of the leaf cupping upward. When it is cured it is usually about the color and has about as much life as a dried oak leaf, and from a commercial standpoint it has very poor burning qualities.

(6) Magnesium, sulphur, and boron are usually used in tobacco fertilizers in small quantities and the injurious effects are not likely to be present.

The lack of a sufficient amount of any of the plant food elements can cause harmful effects which in many instances is as severe as an excess amount. These symptoms are known as certain plant food hungers or deficiencies. The symptoms or the lack of a sufficient amount of the various plant food elements are as follows:

(1) Nitrogen hunger will cause the plant to have a pale yellow color and retard its growth.

(2) Phosphorus hunger will cause the plant to fail in developing the leaf and seed parts and will retard their maturity.

(3) When potassium is lacking the leaves of the plant usually have a rough surface loosing its color on the tips. As the plant grows older this discoloration will develop around the margin of the leaves and then in the central part in small spots. These spots finally turn brown and fall out leaving a hole and also a lifeless leaf in the severe cases.

(4) Calcium deficiency causes malformation of the leaf, leaving the tips of the leaves to be heart-shaped instead of pointed.

(5) Magnesium deficiency is usually present on light sandy soils. It has a bleached appearance on the leaf between the veins and the fibers which causes the quality of the tobacco to be inferior.

(6) Where an insufficient amount of chlorine is used the oily effect is lacking in the tobacco. Chlorine deficiency is something that is rarely seen due to the fact that it comes from low grades of muriate of potash and kainit, which are much cheaper grades of potash than are the other grades.

(7) The lack of the proper amount of sulphur usually causes tobacco to be somewhat stiff or lifeless around the butts of the leaves after it is cured. This is developed in nutritional studies and is rarely ever developed in the fields.

(8) When manganese shortage is present, the tobacco usually is of poor quality with the surface of the leaves having a rusty appearance.

(9) Boron deficiency usually causes the tobacco plants to be very small, the leaves long and narrow, and close together on the stalk.

The sources of plant food in tobacco fertilizers should be as follows:

(1) Nitrogen should be derived from one-third high grade organic material of plant or animal origin; one-third from materials supplying nitrogen in the nitrate form; and one-third from standard inorganic sources. Fertilizers that are claimed to

be made according to the recommended formulas should contain not less than one-third of the total nitrogen in organic form and not less than one-fourth of the nitrogen should be water insoluble. Some of the sources of nitrogen used in tobacco fertilizers are derived from materials such as nitrate of soda, nitrate of potash, sulphate of ammonia, urea, dried blood, cottonseed meal, fish scrap, fish meal, animal tankage, soybean meal, castor meal, and others.

(2) Phosphate should be derived from any source of available phosphoric acid provided the calcium does not exceed six percent calcium oxide equivalent. The sources of phosphate used principally in tobacco fertilizers are sixteen or twenty percent superphosphate, and in some instances Di-calcium phosphate and triple superphosphate are used.

(3) Potash should be derived from any source of available potash provided the chlorine content of a mixed fertilizer does not exceed approximately two percent, except in case of soils where the pH is above 5.6 and then the maximum may be three percent. Sources of potash that are used in tobacco are derived from materials such as sulphate of potash, sulphate of potash magnesia, nitrate of potash, cottonseed meal, and sterilized tobacco by-products.

(4) It is recommended that tobacco fertilizers carry two percent magnesium and at least one-half shall be derived from water soluble materials. The source of magnesium used in tobacco fertilizer is usually derived from sulphate of potash magnesia, magnesium limestone, and magnesium oxide.

(5) The chlorine usually comes from either muriate of potash or kainit, and as stated before, it should not exceed two percent unless the pH reading of the soil is above 5.6, then the maximum may be three percent.

(6) Fertilizers for flue-cured tobacco should be formulated in such manner as to produce the more soluble sulphur compounds used in the fertilizers. There is a relation between sulphur and potash that when the potash is increased the sulphur may also be increased. Sulphur is usually derived from the following sources: Sulphate of ammonia, sulphate of potash, sulphate of potash magnesia, and phosphoric acid. Since fertilizer materials compounded with high analysis are often low in calcium, it is recommended that tobacco fertilizers carry in an available form a minimum of six percent of calcium oxide equivalent.

Each year members of the Agronomy Tobacco Work Conference meet and study the results of what has been obtained by the tobacco experiment stations and the Extension Service. After the study is made the committee formulates recommendations for the coming year. Many of the commercial companies adhere to these recommendations. Each year these recommendations may be obtained from the Agronomy Departments of the various agricultural colleges in the flue-cured area.

The rate in which fertilizers are applied is a very important factor with reference to the stand that is obtained when the tobacco is transplanted and how readily it starts to grow. There are various ideas and methods used in applying fertilizers, some of which are practical and sound while others are impractical and unsound. The most efficient way of applying fertilizer for tobacco is to place it in bands three or four inches to the sides of the row at the approximate level of the root crowns and the plants set between these bands. The most satisfactory implement that has been manufactured to date to do this job is a horse-drawn transplanter with a fertilizer distributor attached. This machine applies the fertilizer on both sides of the row as the tobacco is being planted. Due to the cost of the machine, which is approximately $150 to $175, it is not practical for all tobacco growers to use. There is another method that gives almost identical results as that of the band method and that is the use of an ordinary fertilizer distributor, applying the fertilizer in the furrow marked off for the row, and then follow the distributor with an adjustable six-inch sweep and large fronts. This will allow the soil and fertilizer to be mixed thoroughly. When the listing process is being carried on, half of the fertilizer is turned into the bottom of the furrow. When the other half of the listing process is completed, the other half of the fertilizer is thrown on top of the list thoroughly mixing the fertilizer and soil from the bottom to the top of the list. This will prevent the reaction of the soil and the fertilizer from being strong enough in any area to cause fertilizer injury to the plants. The greatest result from these methods of applying fertilizer will be seen during years when adverse weather conditions prevail, especially dry seasons during transplanting time. There may be other methods of applying fertilizers that give satisfactory results, but so far as is known there is practically no difference obtained by them and under adverse conditions the results are poor.

Many growers practice the side application of various fertilizers and materials, but the recommended practice for this is on soils where "leaching" is subject to take place. Three-fifths of the fertilizer should be applied at transplanting time and the other two-fifths within twenty days after transplanting.

In tobacco fertilizers, from ten to fifteen percent potash is recommended, however, only six to eight percent is recommended in the original application. When more than six to eight percent is used an interference in obtaining a good stand usually occurs from the high amounts of potash. Additional potash may be applied as a side dressing within twenty days after transplanting with identical results as if it had been applied under the tobacco without any interference in obtaining a stand.

Where a split application of fertilizer is practiced, the additional potash may be mixed with the second application of fertilizer and applied in the same manner as though the potash had not been mixed with it. About the best method for applying the second application of any fertilizer material is to drop a small amount by each plant just prior to a cultivation. When the tobacco is being cultivated, it will work the fertilizer into the soil around the plant. There are various commercial top dressers on the market which usually analyze six percent nitrogen, none to ten percent phosphorus, and from ten to twenty percent potash. Where this mixture is used, it is advisable to use only 75 to 100 pounds per acre.

CHAPTER IX

PREPARATION OF THE SOIL FOR TRANSPLANTING

In the various sections of the flue-cured tobacco district, it will be noted that the different sections will have practices, methods, and customs of their own which are adhered to and followed generally, some of which are excellent, others good, fair and poor. Usually when a tobacco producer goes to these sections where fair and poor practices are followed, he finds it harder to put across any of the recommended practices to old tobacco producers. In some sections recommendations are being followed almost one hundred percent while in others they are almost entirely ignored. This is due to lack of result demonstrations on factors affecting the production of high quality tobacco.

To obtain the best results from the preparatory standpoint, it has been found that where the rows are marked off four feet apart, instead of three and one half feet or three feet and nine inches, it has given more satisfactory results in producing the most uniform quality leaf. In some sections the growers will put the rows three and one-half feet apart and every eighth row, five or six feet apart, is used for a truck lane. If the rows are placed four feet apart, it gives ample space for the trucks without much injury or danger to the tobacco. By marking the rows four feet apart it allows more sunlight in between the rows, which is an important factor in developing the tobacco uniformly and also gives it more uniform ripening conditions. Where a reasonable amount of sun light is not admitted to tobacco leaves, it usually does not ripen uniformly and does not have the weight, quality, or texture that tobacco has where the necessary amount of sun light is admitted.

The lists or ridges should be reasonably high and broad. This is a starting point toward the ridge method of cultivation which will be described later in detail. The advantage of a high broad ridge is that small transplanted plants are better protected in wet weather or dry weather. Usually a one horse turning plow with a big wing or moalboard, when two furrows are made, will make a ridge large enough. Where tobacco is planted by horse-drawn planters, the row is usually dragged off by means of a home-made drag. This is necessary to allow the planter to run steadily. The result is that the tobacco is left practically on a level with the middles, which is an undesirable condition in case of heavy rains. Where the tobacco is transplanted by means of hand planters, it is only necessary to mark the hills with a hoe or a hill marker which will allow the tobacco to be on a bed or ridge above the level of the middle and a uniform distance in the row.

The distance tobacco is spaced in the row is dependent upon the fertility of the soil in most cases. For the average soil in the tobacco areas, the plants are placed twenty-four inches apart in the row and usually satisfactory results are obtained. However, the soil may be very thin and poor and in a case of this kind it is necessary to place the tobacco farther apart in the row, probably twenty-six or thirty inches; on the other hand, where the soil is more fertile than the average tobacco soil, it is quite

possible that it may be necessary to place it from eighteen to twenty inches in the row. As a general practice it is not advisable to place flue-cured tobacco much closer than eighteen inches in the row because when this is done the tobacco leaves will overlap and prevent a sufficient amount of sunlight from coming in direct contact with them.

There are two types of transplanters; namely, the hand transplanter and the horse-drawn transplanter. A number of producers who formerly used a horse-drawn transplanter are now using hand transplanters due to the fact that when tobacco is planted by hand planters the root system is left in its natural growing position wherein when planted by horse-drawn planters the rooting system is pushed up the stalk and left in an unnatural growing position. Tobacco planted with hand planters usually starts to growing a week or ten days earlier than when planted by horse drawn planters. The secret of a successful crop is to get it planted as soon as possible, regardless of whether the transplanting, fertilization, or preparation is responsible for an early start. All of these precautions should be taken into consideration and the best practices possible used to get the tobacco off to a quick start.

CHAPTER X

CULTIVATION

Tobacco should be cultivated after each rain, as soon as the soil is dry enough to permit, until the cultivation process has been completed. All experimental and demonstrational work that has been conducted with the cultivation of tobacco has indicated that the ridge method has been far superior to any other method of cultivation used for tobacco. By the ridge method of cultivation is meant keeping the tobacco on a good bed or ridge from the time it is planted until the tobacco is harvested. The advantage of this method of cultivation is that it gives a high, broad, rounded bed in which the roots grow and develop. As the cultivation process goes on from time to time more soil is added around the stalk and this gives the plant an opportunity to take on new roots at each cultivation. The greater the root system, the plant is able to take more plant food from the soil and develop into a healthy, thrifty, quality plant of tobacco.

Not only does the ridge method of cultivation cause the root system to be greater but it also protects the plant in an extremely wet or dry period. In an extremely wet period, if the root system is on a high bed with a low middle, it will drain the surplus moisture away from the rooting system thus preventing the plant from becoming drowned or stunted. During an extremely dry period, the broad ridge or bed retains a sufficient amount of moisture for the plant to grow and develop in spite of the adverse condition. Where certain diseases are present that affect the rooting system of the plant, the ridge method of cultivation also gives it another advantage in that it enables the plant to take on new roots above the old infected ones. Where this method of cultivation is followed it has given an increase in yield and quality and also in value to an average of from $20.00 to $35.00 per acre increase over the flat method of cultivation.

The best procedure for carrying this method of cultivation out is to scatter the middles immediately after transplanting. As soon as the tobacco starts to grow it is necessary to loosen the soil around the plants. This can be done best by the use of a small cultivator. Immediately after this operation is performed by the cultivator, a hoe cultivation can be given which will be as profitable as any cultivation during the entire cultivating season. By using the hoe it will enable the plants that are partially covered with soil to be uncovered and the ones that have taken a start to grow and those that are shanky to have soil placed around them, which will enable all plants to get a good uniform start in the beginning. This would bring about uniformity all the way through to the market.

Following the first cultivation tobacco should be cultivated every week or ten days up to about a week prior to topping. In the second cultivation the tobacco should be large enough to allow some soil to be placed around the plants with a plow. This can be done very satisfactorily by means of a plow with an adjustable sweep similar to the old-fashioned "cotton plow". Immediately after the tobacco is plowed the middles should be scattered. At the third cultivation the same plow that was used at the previous cultivation may be used with larger attachments. The middles should be scattered again immediately following this cultivation; in fact, it is a

very good practice never to allow the sun to set with tobacco middles not open due to the fact that the siding furrows will hold an excessive amount of water when heavy rains occur. Usually when average weather conditions prevail four cultivations are all that are necessary for a crop of tobacco.

At the last cultivation the most desirable plow to use is a one-horse turning plow with a large wing or moalboard and a sixteen or eighteen inch sweep, about two and one-half inches wide, attached to the shank of the plow by the same bolt that holds the moalboard. This will enable the soil to be placed under the leaves around the stalk without breaking or damaging the bottom leaves very much, and at the same time the plow is far enough in the middle to avoid breaking or damaging the rooting system. The moalboard or wings move the soil over and the sweep pushes it under the leaves around the plant. The middles are scattered by the use of a plow with long sweeps attached that will leave the tobacco on a broad bed.

Under abnormal weather conditions it will be necessary to vary the procedure of cultivation from that described above. When the tobacco has a tendency to become peaked and hard, it is advisable to take a turning plow with the point and loosen the soil deeply on both sides of the row of tobacco, then take the same plow with a small wing or moalboard and rebreak the middles by making two furrows in each middle. After a hard packing rain, if the middles become hard or compact, it is advisable to always scatter the middles with a turning plow.

CHAPTER XI

CONTROL OF INSECTS, TOPPING, AND SUCKERING

The insects most harmful to flue-cured tobacco are horn worms, bud worms, and flea-beetles. A very satisfactory method of control has been developed by the Entomologists for all of these insects. For the horn worm, spraying with Arsenate of Lead is a very satisfactory method of control. This may be applied either as a dust or a spray but most growers apply it as a spray by means of a horse-drawn sprayer. The spray is composed of from two to four pounds of Arsenate of Lead to fifty gallons of water. This is enough to spray one acre. Sometimes it is necessary to make two or three applications. The horn worm is usually most active in June and August.

The flea-beetle may be controlled by dusting with Cube or Derris powder containing one percent Rotenone dust. The flea-beetles are most harmful when the tobacco is small, however, in some cases they do considerable damage when the tobacco is large, and when spraying for horn worms if one pound of Paris Green is added to the spray mixture it will serve as a dual preparation spray, killing both horn worms and flea-beetles.

Under average conditions the bud worms cause more damage than most insects and can be controlled very easily by dropping one-half teaspoonful of bait in the bud of each plant. This bait is made by thoroughly mixing one pound of Arsenate of Lead with fifty pounds of corn meal. The bait should be applied to the buds of the young plants early in the morning. Apply the bait as soon as the first signs of bud worms appear and if necessary a second application should be made in about ten or fifteen days.

Topping tobacco is more or less an art. The grower must have experience in observing the tobacco growth, knowledge of the amount of fertilizer used, and how it will react to different seasonal conditions on different soil types in order to know how to top tobacco. Tobacco should be topped just as soon as the seed formation is observed and before the stalk becomes hard. Generally speaking, on average tobacco soil, the tobacco will mature when from fifteen to eighteen leaves are left on the stalk. On poor soils it should be topped lower and on heavier soils it should be topped higher. Tobacco develops best if not allowed to blossom and the stalk to become hard. Just as soon as the seed pods begin to show, topping should begin. About every three days the tobacco will run up enough to top. If tobacco is topped as uniformly as possible, it will mature more evenly. It is an excellent idea to top tobacco a little higher than necessary, if there is some doubt about how high or low it should be topped, then within about ten days if the top leaves are not going to mature they will show signs by becoming narrow and stand erect on the stalk. If this condition exists, it will then be necessary to go back over the tobacco and break out the leaves on such plants.

Many growers lose a large portion of their profit each year by not keeping the tobacco suckered as closely as it should be. Suckers when allowed to remain on the stalk will consume the plant food that would ordinarily go into the leaf, thereby making less weight and quality. It is necessary to sucker tobacco each week. If a wet spell should occur, it might be necessary to sucker it twice a week.

CHAPTER XII

SELECTION OF SEED PLANTS

Future crops of tobacco are dependent upon seed selection, whether by individual growers or commercial seed companies, and whether they are capable and efficient or incapable and poor at doing the job. The quality of tobacco can be improved from year to year by giving thought and careful consideration to the selection of seed plants.

The seed plants should be selected before the tobacco is topped. They should be typical of the variety planted. The leaves on plants of any variety should be well spaced on the stalk, and the seed plant stand out above the average plants, if the quality is to be improved by selection. The veins of the leaves should alternate as they come out from the mid-rib instead of coming from the same point on either side. The largest plants growing in a rich spot in the field will not give the best quality in all cases. It is necessary for a fourteen pound paper bag to be placed over the seed parts just before the first blossom opens to prevent cross-pollination. Tobacco is a self-pollinated plant but can be cross-pollinated mechanically. If the stalk is too slender to hold the bag upright when tied on, wait a few days and pinch off the first blossoms and the pods, and allow the stalk to become stronger. Bud worm bait should be applied to seed pods before the bags are put on. To get best results it is necessary to prune the branches to three or four in order to give room for development under the bag; in other words, leave only the "crow's foot" as the healthiest, soundest seed come from these pods. Normally one seed plant will produce about one-half ounce of seed. When the tobacco has matured, the best seed plants must again be selected from the crop if the most is accomplished by selection. After the seed pods have thoroughly matured, it is necessary to remove the tops of the plants to a building where they may be hung up and allowed to thoroughly dry. When they have dried thoroughly the seed should be taken from the pods and cleaned by means of a tobacco seed cleaner. Many of the County Agents and Vocational Teachers have a seed cleaner available for tobacco growers to use.

When tobacco seed are certified, in addition to bagging the seed parts of the plant as stated above, it is necessary to have them inspected by Field Inspectors from the Crop Improvement Association. The plants are carefully inspected and if any undesirable plants are present due to irregularities of leaf formation or disease, the seed parts are destroyed. If the requirements for certification are fulfilled in the field, the next step is to clean the seed by means of a tobacco seed cleaner, then a sample of the seed sent to the Crop Improvement Association for a germination test. The germination must be 80 percent or more before the seed can be certified. When this is done and the seed have passed all requirements, the seed are certified and guaranteed to be quality seed, free from disease, and true to the type of the variety which they represent. When a producer purchases seed which have been certified by the Crop Improvement Association, he is buying as good quality seed as money can buy.

CHAPTER XIII

HARVESTING, CURING AND STORAGE

The harvesting and curing process in tobacco production demands experience and skill. This is one point in the production of a crop that the producer can make or lose, if he is not on the alert at all times.

Harvesting should begin as soon as the bottom leaves begin to turn yellow. The first leaves can be pulled a little greener if the leaf is mature. Tobacco usually has to be primed at least once each week if the seasons are normal. In abnormal seasons it may be necessary to prime it twice each week as only ripe, well-developed leaves should be pulled. Uniformity in pulling tobacco will add to the quality as much as any other factor. The leaves should be laid in the truck in a manner that will not break or bruise them when taken out of the truck to be looped in bundles on the stick. About three leaves to the bundle, with about twenty-six or thirty bundles to a four and one-half foot stick, is sufficient. The sticks of tobacco should be hung in a rack, conveniently located in the shade where the tobacco is strung, to prevent bruising until it is ready to be hung in the barn. The sticks should not be crowded in the barn. About six inches between the sticks on the tier poles in the barn is a good distance for average size tobacco.

The curing process should be started as soon as the tobacco is hung in the barn and the temperature raised in the barn from four to five degrees higher than the outside temperature, usually about 85 to 100 degrees Fahrenheit. This temperature is maintained until the leaf is fairly yellow, requiring from 24 to 36 hours. The temperature should then be raised 4 to 5 degrees each hour, depending upon the rapidity with which the green is fading, until 120 to 125 degrees Fahrenheit has been reached. By this time the leaves should be a pale yellow. This last raise will toughen the tobacco so that it will stand higher heat. Hold this temperature until the tips of the leaves begin to dry, then raise the temperature 4 to 6 degrees each hour until 135 to 140 degrees Fahrenheit has been reached. Hold this temperature until the leaf tissue is dry. During this period the color will be fixed. As soon as the leaf is dry, raise the temperature from 5 to 10 degrees each hour until 180 to 190 degrees Fahrenheit has been reached. This heat may be held until the leaf stem is dry in all parts of the barn. The time required to cure a barn varies from 84 to 96 hours.

After the tobacco is thoroughly cured and the temperature has gone down, the barn doors are opened in order that the tobacco may come in "order or case," so that the tobacco can be removed from the barn without breaking. Frequently, it is necessary to wet the floor of the barn in order to hasten the softening of the cured leaf.

When the tobacco is removed from the barn, it is carried to the pack house and packed in a long pile or "windrow" where it is left for a few days. It is then packed in a square coop with all the leaves turned

inwards and the butt of the leaves showing on the outside. Tobacco so cooped should have enough moisture in it so that it will straighten out nicely and undergo such changes as are necessary for the improvement in color. On the other hand, if it is in too high order when packed, it may redden or damage. Tobacco packed in this way may then be left until the grower is ready to grade and market.

CHAPTER XIV

PREPARATION OF FLUE-CURED TOBACCO FOR MARKET 1/

It is a matter of common knowledge that much of the tobacco offered for sale is poorly sorted. This fact was brought clearly to the attention of farmers in a press statement issued by the Tobacco Board of Trade in eastern North Carolina. The statement was as follows:

T O B A C C O F A R M E R S

"In view of the large quantity of tobacco offered for sale which has been badly graded, in many instances green and brown leaves mixed in the same bundle, we have been requested by the warehousemen and representatives of the buying companies to urge the farmers to give more thought to the importance of careful preparation of tobacco for market.

"It is important that you give careful attention to the grading of low grades as well as the better quality tobacco. Tobacco offered for sale in a mixed condition or with objectionable strings or other foreign matter, regardless of the quality, does not attract all buyers. Carefully graded, nicely handles, clean tobaccos, always bring top prices."

The principal buyers of flue-cured tobacco are manufacturers who buy for their own factories and dealers who purchase and pack tobacco for resale or for export. In addition, there are speculators whose operations consist largely of buying tobacco which, because of poor preparation for market or other reasons, sells for less than its current market value. Such tobacco often nets the speculators a profit through resale of it on the auction floors, without incurring any expenses for conditioning, packing, storage, or shipping. In some cases the speculators re-sort the tobacco. Usually the re-sorting is done by bundle with some leaf-plucking, but sometimes the tobacco is untied and is leaf-picked. In either case the object is the same, to correct the sorting mistakes made by the farmer and to resell the tobacco, properly sorted, at a profit.

By exercising the skill and care that the farmer failed to use, a speculator sometimes makes more profit on a lot of tobacco than the farmer received in gross returns for several months of work. By carefully and intelligently sorting tobacco a grower can frequently earn for himself the money which otherwise may go to the speculator.

Proper Light for Sorting

The first essential to correct sorting is suitable light. Farmers as a rule do not realize the importance of suitable light for sorting. Under

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1/ This information was taken from a circular written by Mr. Hugh W. Taylor, Senior Marketing Specialist, Agricultural Marketing Service, United States Department of Agriculture, Washington, D. C.

improper light a lot of tobacco may appear to be uniform in quality and color, whereas under proper light conditions the same lot may show a mixture.

Sorting rooms should be provided with ample window space. All windows should be on the north side of the building. Sorting should be done only in proper light - never in the direct rays of the sun, or by artificial light, or too early in the morning, nor too late in the evening. Skylights, such as are used in auction warehouses, are excellent when properly installed. They should be set into a roof which is sufficiently high to permit proper diffusion of light. This condition is difficult to meet in stripping rooms, whereas windows can be installed along a north wall at small expense. Several windows should be set close together in the wall about 2½ feet above the floor. Persons who are sorting tobacco should have their backs to the windows so that the light will fall over their shoulders on the tobacco.

If proper lighting of existing buildings is impracticable, growers may use a rectangular tent for sorting. The tent should be made of ten ounces white duck or canvas. It can be erected outside the building in which tobacco is stored. The light in a tent is about the same as the light in a well-lighted warehouse. Tents are inexpensive compared with the cost of buildings and can be used for several years. They should be laundered when they become soiled.

Proper Order for Sorting

Tobacco must be in proper "order" for sorting. Order, as used in the tobacco industry, refers to the amount of moisture in tobacco. If in too dry order, tobacco will be injured by breakage during the sorting. On the other hand, if the tobacco is too soft there is danger of discoloration by bruising and, with light-colored tobacco, danger of the color becoming materially darker and thereby decreasing the value. Tobacco is in proper order for sorting when it has absorbed just enough moisture to make the leaves pliable, so they may be handled readily and can be opened without breaking.

Some growers depend entirely on natural atomospheric conditions to "order" tobacco while others use artificial means when the atmosphere is dry. Whichever method is used, care is necessary. For handling or sorting, it is better for tobacco to be slightly on the dry side than too soft.

Sorting

Sorting is one of the most important operations in preparing tobacco for the market. A crop of comparatively poor quality can be sold to best advantage by correct sorting and proper handling, whereas a crop of good quality can be greatly reduced in value by careless sorting and handling. It should be borne in mind that the object of sorting is to bring together, in lots, leaves of similar body, quality, color, and size. Each different lot should be tied into bundles or hands and sold separately.

The procedure in sorting flue-cured tobacco will depend somewhat on the method used in harvesting the crop. The bulk of flue-cured tobacco is harvested by "cropping" or pulling leaves, individually, as they reach the proper degree of ripeness. A small part of flue-cured tobacco is harvested by cutting the plants; this is known as "stalk-cutting." The remarks herein are not directly applicable to stalk-cut tobacco.

Normally, the leaves of flue-cured tobacco grow on the stalk in a certain order or sequence: Lugs near the bottom; Cutters in the middle; and Leaf, including fillers and tips, from near the middle to the top. These three general divisions - called Lugs, Cutters, and Leaf - are known as groups. The division lines between groups will vary in different fields and with different plants. Crops of superior quality will contain a fourth group called Wrappers.

Each barn should be bulked separately or at least each bulk should contain tobacco of the same cropping. This is for the purpose of keeping the natural groups, by croppings, from getting mixed. If the character of tobacco found in different sections of a barn is materially different, it is advisable to review the sticks of leaves as they are taken down, and bulk together the sticks that contain similar tobacco. This preliminary separation will save time when the leaves are sorted.

Before sorting a barn of tobacco, some farmers select a dozen or more sticks from the barn and use them in working out the lots to be made in sorting the barn. Sticks for this purpose should be selected with a view of getting, as nearly as possible, the full range of quality, color, and length to be found in the barn. Tobacco from these few sticks is carefully studied and similar leaves are matched to determine the number of grades necessary to obtain uniformity in each lot.

After the qualities and colors of the several lots have been definitely fixed in the mind of the sorter, an effort is made to sort the rest of the barn on the same basis. Sometimes tobacco of another grade, not represented in the selected sticks, will be found and a new lot must be made after the sorting has started. Sticks to be used for the preliminary sorting can be selected at the time the tobacco is taken from the barn and bulked. These selected sticks should be placed on top of the bulk where they will be readily accessible for study before the main part of the bulk is sorted.

Bulking under proper conditions generally improves all qualities of tobacco. Green tobacco is greatly improved when allowed to remain in bulk for some time. Tips normally carry a high percentage of green tobacco which would materially improve if allowed to remain in bulk for several weeks before being marketed. When bulked in proper order, green tobacco will lose much of its green color and immature appearance. A marked difference is frequently noted in one week if the weather is warm.

Lugs. The first cropping or curing from a field normally consists chiefly of plant-bed leaves, unless these have been lost because of unfavorable weather conditions. They are commonly referred to as "primings" or "priming lugs." They are the very thin, pale, silky, and premature leaves

which are very low in oil and wax, and of a dull or dingy finish. Primings absorb and give off moisture more rapidly than other lugs which are grainy and ripe. They also have a characteristic odor. The first leaves harvested usually are primings and they should be kept separate. Most of the plant-bed or priming leaves will ordinarily be removed in the first cropping. If some priming leaves are found in the second cropping, they should be separated from the ripe, grainy lugs.

The second cropping, and sometimes a part of the third cropping, usually consists of dry-natural lugs, which are distinct from the primings. Instead of being premature they are usually ripe and show a considerable amount of grain, especially in the better qualities. Lugs can be recognized by their thin body, and by a considerable percentage of injury characteristic of leaves grown near the ground. They are shorter than leaves higher up the stalk, with the exception of tip leaves. Lugs are normally of a dull or dingy finish and sometimes carry a noticeable amount of sand which should be shaken from the leaves as the hands are hung.

Lugs should be sorted on the basis of quality and color. The lightest colored lugs usually have the thinnest body. As color and body are usually closely associated in lugs, the color divisions will generally take care of body. Quality in lugs is largely determined by the percentage of injury, size of leaves, maturity, color shade, and finish. The common-quality lugs may carry dingy and a few burnt and trashy leaves, whereas good quality lugs should be free of such leaves, have fairly clear finish, be thoroughly ripe, with plenty of grain and of uniform color.

When the leaves have been sorted into lots of like quality and color, each lot should be tied into medium-sized hands or bundles of 16 to 20 leaves. The tie-lieaf should be of the same quality and color as the tobacco in the hand, so that it will not contrast with the leaves it binds together. This seems a small point, but is very important. A green tie-leaf should be used only for tying green tobacco. After being tied, each lot should be placed on separate sticks. The sticks of sorted tobacco can then be bulked, if the tobacco is in safe-keeping order. The bulk should be carefully covered to prevent the tobacco from bleaching, drying out, or absorbing excessive moisture.

Care should be taken to examine the bulks frequently, especially in hot weather, to see that the tobacco is in proper order. If the tobacco is found to be soft and there is danger of mold, the sticks should be taken up in drying weather and hung on tiers until the tobacco has dried sufficiently to keep safely; then it should be rebulked. Sometimes airing the tobacco by rebulking, without hanging, will be sufficient. If so, this is preferable to hanging. If tobacco has been in bulk for some time the leaves have a tendency to stick together and the hands should be shaken gently to separate the leaves and allow the air to pass through them.

Cutters. In a normal field, when the leaves are cropped and housed at the right time, cutters usually appear in the third cropping. Some cutters may be found with the second cropping and some with the fourth, depending on the growing season, the number of leaves pulled in each cropping, and other factors.

Cutters are thin-to-medium in body and have many characteristics in common with lugs. They do not have the injury associated with leaves grown near the ground, and the leaves are usually longer and wider than lug leaves and have a clearer finish. Cutters generally have fine fibers and the leaf surface has a slightly puckered or wrinkled appearance. Cutters should be carefully sorted according to quality and color. They are divided into two colors, known as lemon and orange. The lemon leaves are generally thin-bodied while the orange leaves are normally of medium body. When sorted, the leaves should be tied, hung on sticks, and bulked as in the case of lugs.

Cutters as well as the better qualities of lugs are in strong demand by all manufacturers of cigarettes, and competition is usually keen on all properly sorted lots.

Leaf. The leaves of this group are thicker, or heavier bodied, than Cutters and usually have more prominent fibers. With the exception of the choice and fine qualities, the leaves are usually narrower and have more pointed tips. The leaves of this group vary considerable in length on individual plants, the tip leaves being the shortest. Leaf does not have characteristics of lugs unless it is very overripe. Overripe or very grainy leaves of this group are known as "smoking-leaf." Smoking-leaf is distinguished by being low in oil, relatively thin, non-elastic, mellow, and very grainy, and by a considerable amount of injury of a kind different from that characteristic of leaves grown near the ground.

In sorting, smoking-leaf should be kept separate from the straight side. Both should be divided into lots according to quality, color, and size. After leaf has been sorted, it should be tied, hung on sticks, and bulked.

Wrappers. Wrappers are selected from the leaf and cutter groups and may be described as the fancy leaves of these groups. They must be practically free from injury, must be smooth, elastic, oily, firm, and strong, and must have bright finish and small to medium size and blending fibers. The average crop does not contain any wrappers, and the percentage of wrappers in many other crops is so small that producers are scarcely warranted in making a separate lot for wrappers. On the other hand, if a crop is of exceptional quality and contains a fair percentage of wrappers, it will pay farmers to sort them out.

Wrappers, if properly sorted and handled, command a premium on the markets. The wrapper leaves should be divided into qualities and colors with special attention given to body, as the thin and the medium-bodied wrappers are used for different purposes. Wrappers are usually sized according to length and tied in small hands. Wrappers should be handled with special care to prevent injury to the leaves. As with other groups, each quality and color should be segregated, placed on sticks, and bulked. The bulk should be given extra protection to prevent injury or damage from any cause.

Green, Off-Colored, and Non-descript Tobacco

Most crops of flue-cured tobacco contain green, off-colored, or non-descript tobacco in varying quantities. These relatively inferior qualities, if not separated from other lots, may materially lower the value of good tobacco. Speculators sometimes make handsome profits by plucking a few

green, off-colored, or non-descript leaves from a lot and then reselling the tobacco. This profit would accrue to the grower if reasonable care were taken in sorting. If a barn or curing contains sufficient green, off-colored, or non-descript leaves, separate lots should be made for each.

In curings that contain very little green, off-colored, or non-descript tobacco there may not be a sufficient quantity of each to make separate lots, in which case these leaves should be thrown together in one lot.

Size of Hands

The size, uniformity, and method of tying hands are important. The tobacco trade desires that hands of flue-cured tobacco be of uniform size, not "capped" with the tie-leaf, and contain 16 to 20 leaves each.

Flue-cured tobacco is redried for domestic storage or for export. The percentage of moisture varies according to trade requirements but the amount of moisture should be uniform throughout each hogshead, particularly for export. If hands are very large it is difficult to redry tobacco and with some hands excessively large and others very small the tobacco cannot be redried to a uniform percentage of moisture. The tie-leaves should not cover, or "cap," the butts of the hands. The "cap" retards the escape of moisture and makes difficult proper redrying of tobacco.

Tobacco containing bits of cotton twine, used for stringing leaves, is undesirable as foreign matter must be removed before the tobacco is manufactured. The removal of bits of twine is a tedious and expensive operation after tobacco has been pressed into hogsheads, but can be easily and cheaply removed by farmers as the leaves are being tied into hands.

Tobacco growers should meet the requirements of the tobacco trade and prepare tobacco for sale in uniform, uncapped hands of 16 or 20 leaves each and take care to remove all bits of twine and other foreign matter. Tobacco prepared for market in this way is more attractive to buyers and usually sells at the highest prices consistent with quality and market demands.

Does Proper Preparation Pay

Farmers sometimes say that careful sorting of tobacco does not pay for the extra time required. They cite sales where one part of a barn of tobacco was carefully sorted before sale, while the remainder of the barn, which was divided into only two lots, sold at greater profit. It may be, and sometimes is true, that certain curings of very uniform tobacco can be handled to an advantage in this way but the results are misleading since they do not apply to all barns of tobacco. Also, farmers who fail to profit by sorting their tobacco attribute their loss to "a bad sale" rather than to poor preparation.

In order to test the value of proper sorting and preparation of tobacco a few lots of tobacco on which unsatisfactory bids were made because of poor sorting, were re-sorted and again put up for sale. The results on two lots are given below.

For a lot of 202 pounds of mixed tobacco, 20¢ per pound was bid which amounted to $40.40. This lot was resorted into three grades and again offered for sale as follows:

Grade	Weight Lbs.	Price Cents	Amount
C4L	100	.30	$30.00
X2L	44	.28	12.32
B3LV	52	.26	13.52
Total	196		$55.84

Three men worked 2½ hours to re-sort the tobacco. It sold for $15.44 more than was bid the first time it was offered for sale. This amount equals $7.64 per 100 pounds and represents an increase of 38 percent above the amount that would have been realized from the first bids. It should be noted that this lot contained 100 pounds of tobacco for which the grower finally received 30¢ per pound, and that the lowest price obtained for any lot of the re-sorted tobacco was higher than the bid for the mixed lot as originally sorted.

Sixteen cents per pound was bid for another lot of 136 pounds of mixed tobacco, or $21.76 for the entire lot. This tobacco was re-sorted into two lots and sold as follows:

Grade	Weight Lbs.	Price Cents	Amount
B4LV	72	.13	$ 9.36
B3L	64	.29	18.56
Total	136		$27.92

Three men worked 1 hour to re-sort the tobacco. The sale price of the re-sorted tobacco amounted to $27.92, which was an increase of $6.16 above the amount he would have realized without the additional care taken in the second sorting. This increase equals $4.52 per 100 pounds and represents 28 percent more than the original bid. The lot of tobacco as originally offered for sale contained 47 percent of B3L which finally sold at 29¢ per pound.

The experience of farmers generally follows closely in line with the results of proper sorting cited above. A farmer who offered several lots of tobacco that totaled 1,420 pounds wrote as follows: "This tobacco was bid on with prices ranging from 12¢ to 19¢, or an average of approximately 16¢.

"Wewere not satisfied with prices offered and turned the tickets on the above lot of tobacco. You will probably recall that after these tickets were turned, we discussed the condition and grades of this tobacco with you and you very kindly advised us to re-work this tobacco, taking out some burned and green leaves from the good tobacco. When this tobacco was re-worked it was placed back on the market.

"We lost 6 pounds in re-working this lot of tobacco but gained approximately $76.56 in increased prices. In re-working the tobacco there were 72 pounds of burned and green leaves taken from this lot of tobacco which brought 8¢ per pound. It was remarkable to me the difference that was realized from this sale after grading the tobacco in line with your suggestions."

The sum of $76.56 amounts to $5.39 per hundred pounds on 1,420 pounds of tobacco.

Reference is made in the fifth paragraph on page 33 to profits which speculators make from re-handling tobacco offered for sale and that has been improperly prepared for market. The following instances are examples:

A speculator bought a lot of tobacco weighing 146 pounds at 6¢ per pound, or for $8.76. After plucking out 4 pounds of green and off-colored leaves, the remaining lot of 142 pounds was sold at 22½¢ per pound, which returned $31.95, less warehouse charges. The difference between the cost price and the sale price was $23.19, or an increase of almost 265 percent.

In the second instance a lot of 292 pounds was bought by a speculator at 8¢ per pound, or for $23.36. The green and off-colored leaves were removed from the lot which then weighed 274 pounds. The tobacco was sold at 25¢ per pound, which returned $68.50. The difference between the amounts representing the cost and sale prices was $45.14 or an increase of 194 percent. These two cases, however, are extreme examples; speculators usually make much smaller profits.

The above instances, all representing transactions on flue-cured tobacco markets, and many more which could be given, show that proper sorting and preparation of tobacco for market pays farmers handsomely for the time and money expended on this important phase of tobacco production.

Bulking Graded Tobacco

Flue-cured tobacco should be bulked when it has been sorted, tied, and placed on sticks. After curing, it should not be hung in tiers except for the purpose of drying or removing excessive moisture. In placing hands on sticks, each bundle should be divided over the stick and the butt end of the tie-leaf smoothed down with the rest of the bundle. When the tobacco of each barn (or barns of the same cropping) has been sorted, hung on sticks, and temporarily bulked, the tobacco should be re-bulked so as to combine or bring together all sticks containing hands of like quality and color. As the temporary bulks are broken, the sticks of tobacco should be carefully matched as to quality and color. This helps to reveal errors in sorting or sticking and to insure uniformity in each lot. The work must be done when there is suitable daylight; never by artificial light.

After the sticks have been carefully checked and as the tobacco is rebulked, attention should be paid to the sequence in which the several lots are placed in the bulk. This will facilitate keeping the lots separated in loading and unloading when the tobacco is ready for market. If sorted tobacco remains in bulk for any great length of time before it is marketed, it may be

advisable to re-bulk from time to time. In re-bulking, care should be taken that leaves are not crumpled or otherwise injured. Sheets of paper or other markers should be placed between the lots, in bulking. Loading is often done when the light is poor - sometimes by lantern light - and unless markers are used there is danger of the lots becoming mixed, which usually results in loss to the farmer.

Bulks should be built on a well-ventilated wooden floor or platform. Tobacco should never be bulked in contact with the earth or a concrete floor. Bulks should be covered to protect the tobacco, otherwise it may become dirty from dust, faded or bleached from the light, or it may dry out or absorb excessive moisture.

Order of Tobacco for Marketing

The order, or moisture content, of tobacco when offered for sale is important, especially when sales are extemely heavy or are blocked for any considerable time. If tobacco is too dry it is rough to the touch, does not show to advantage, and suffers considerable injury through breakage in handling. On the otherhand, tobacco containing excessive moisture will bruise in handling, may deteriorate in value through becoming darker in color, and may be damaged if not steam-dried within a short time, especially when the weather is warm and the atmosphere humid. When blocked sales occur and tobacco is offered for sale in excess of re-handling facilities, in order to prevent losses, buyers must exercise care in purchasing tobacco, and lots in excessively high order are either passed or bought on a safe margin. In either case the farmer will suffer loss in the proceeds from his product.

Lugs and cutters are in proper order for sale when they are just sufficiently moist to prevent injury in handling. Lugs, especially priming lugs, should be sufficiently dry to rattle slightly when shaken, but not dry enough to break. Tobacco of Leaf grades can carry more moisture than lugs and cutters. The tobacco of this group should contain enough moisture to make the tobacco supple but excessive moisture should be avoided. Wrappers should be in fairly soft order when sold. If too dry they will not show the oil, elasticity, smoothness, and finish required to meet wrapper specifications. Wrappers should not, however, contain too much moisture as they bruise and discolor easily when in very high order.

Loading and Unloading

As the sticks of tobacco are taken from the bulk they should be carefully loaded so that the leaves are not injured or the lots disarranged. Markers between the several lots should be placed with care to make certain that the lots will not become mixed in unloading. Many farmers make a good job of sorting only to get the lots mixed in the rush and excitement of unloading when they get to market. The load of tobacco should be covered with a tarpaulin or other suitable material to protect it from rain, drying out, or getting dusty on the way to market.

Except with stalk-cut tobacco, it is seldom that all groups will be sold at one time. If only lugs or cutters or both are being sold, the usual arrangement is for the lowest quality to be sold first and then in order of quality to the best. If there is a non-descript lot it would come first. If there is no non-descript, then the commonest - whether it be green, off-colored, of the lowest lot of lugs - followed by the next best, and so on to the best lot.

It sometimes happens that a farmer delivers to market at the same time tobacco of two or more curings, in which case he will have tobacco of two or more croppings, and probably of two or three groups. The arrangement then is similar to that followed in which some tobacco of all groups is likely to be marketed at one time. The most commonly accepted practice in marketing all groups at the same time is to build up from the commonest lug to the best lug, followed by the lowest cutter and then in order to the best cutter. The best cutter should be followed by wrappers if there are any. Then follow with the best leaf, the next best leaf, and so on to the commonest leaf. In this arrangement, the tobacco will be offered for sale in the order it is removed from the plants.

Should all lots offered at one time be of the leaf group, it is customary to arrange the lots so that they will be sold in order of quality from the lowest to the highest. If wrappers and leaf are sold at the same time the lots of wrappers should follow, in order of quality, the best leaf.

The arrangement of lots for sale at auction may be regarded by some as a matter of minor importance, but it is a factor which may, and often does, influence the sale to the advantage or disadvantage of the farmer. It assists both the starter and the buyer, if tobacco is sold in order of quality. Tobacco displayed in this order is more attractive and usually sells to advantage as compared with crops laid out for sale without regard to group or quality.

Size of Lots

The size or weight of lots offered for sale is important. Very large lots are sometimes regarded with suspicion. Flue-cured tobacco usually varies so much in quality and color that very large lots of uniform quality are exceptional. On the other hand, very small lots are objectionable to warehousemen and buyers and may be unprofitable to the seller. A small basket of tobacco occupies as much floor space as a large basket; warehousemen object to very small lots since they reduce the poundage that can be placed on a warehouse floor. Small lots may be objectionable to buyers, as each lot purchased must be checked, weighed, and identified with warehouse accounts.

The sale and book work for a small lot requires as much time as for a lot of normal size and, therefore, excessively small lots increase the handling cost to buyers as well as to warehousemen. On flue-cured markets there are usually minimum charges per lot for weighing and auction fees, in addition to the commission charged on all sales. If lots are exceptionally small and the tobacco is of poor quality, it may sell at a price that will not cover warehouse charges. In such cases, and there are many when tobacco prices are low, the excessively small lots could be discarded with profit to

the farmer, as any lot that brings less than the charges brings a deficit that is deducted from the sale of other lots.

No definite rule can be given as to the minimum and maximum size lot that should be offered for sale. The size of the lot will depend upon the range of quality, color, and length found in a single curing if properly sorted. Although correct sorting is to the advantage of the farmer, it would be a mistake to take a single barn and draw the divisions too close, for that would mean a number of very small lots. Sometimes if the sorting has been very close, two lots may be so nearly alike that they could be combined. In other words, a very small lot could be put with another one that corresponds closely in quality and color. But if the lots are small and distinct in quality or color, they should not be mixed together. Sometimes high-quality lots of light weight can be marketed at a profit. In other cases, it would be better to throw away a very small lot of inferior quality than to mix it with a lot of distinctly different tobacco.

Data collected by the Agricultural Marketing Service seem to indicate that, on flue-cured tobacco markets, lots which weigh in excess of two hundred pounds sell at higher prices when split into two lots. It should not be inferred that lots of tobacco weighing more than two hundred pounds always sell below established market prices but records indicate that prices tend to be adversely affected by large lots.

Marketing

Before selling his tobacco, the grower should have definite and unbiased information as to the quality and approximate market value of his product. Unless this is available, the farmer is without adequate guidance in disposing of a crop which requires many months of hard work and a considerable cash outlay to produce. This information should be on a grade basis.

A grade, in the tobacco trade, is a descriptive name for tobacco of a particular group, quality, and color. A lot properly sorted will naturally fall into one of several groups, one of several qualities, and one of several colors. Therefore, if a farmer knows to what group, quality, and color any lot of tobacco belongs, he knows the grade of that lot. In the United States, tobacco standards for flue-cured tobacco, letters are used to represent the groups, as A for Wrappers, B for ordinary Leaf, H for Smoking Leaf, C for Cutters, X for ordinary lugs, P for Priming Lugs, N for Non-descript, and S for Scrap. Each group is divided into qualities designated by numbers; 1 represents the best of its group, 2 the next best, and so on to the commonest tobacco in each group. For example, A1 would be the best Wrapper, B1 the best Leaf, C1 the best Cutter, etc. The color, which is the third factor, is also designated by certain letters as L for Lemon, F for Orange, R for red, d for dark, and G for green. "C3L" is therefore a grade or name which would completely describe a lot of Cutters (C) of third quality (3) of lemon color (L). From this brief explanation of grades, a person should know in a general way what tobacco is represented by the grade X2F or any other standard grade symbols.

CHAPTER XV

TOBACCO INSPECTION, MARKET NEWS, AND DEMONSTRATION SERVICES 1/

Inspection of tobacco according to standard grades as an aid to growers in marketing their crop was inaugurated in 1929 by the United States Department of Agriculture. This service is now about 11 years old, but until recently the work has been conducted on such a limited scale that most tobacco growers are still unfamiliar with what the service is, how it is conducted, and how it can be of dollars-and-cents value to them.

Reasons for the inspection and market news services are readily understood by every farmer who has sold a split lot of tobacco for two widely different prices, or has taken in a basket and resold it on the same floor for possibly twice or three times the first price. Every tobacco grower knows there is much uncertainty about the price any basket of tobacco will bring, and that there is a wide range in the prices paid for lots of tobacco of the same quality. He knows that often he has lost money because he was on the short end of that price range.

Inspection and market news services have been developed to provide a measuring stick for quality and price in order that growers may protect themselves against loss in the sale of their tobacco.

The inspection service undertakes the inspection and certification of the grade of tobacco, before sale, at auction markets. Packed tobacco is also inspected and the grade is certified upon application by interested parties.

The Department of Agriculture, cooperating with State agencies, has made tobacco inspection service and tobacco price reports available to growers on an increasing number of markets, to determine whether by informing growers as to the grade and current market price of tobacco, basket by basket, the auction-market system would be improved and the wide range in prices paid to growers for the same grade of tobacco would be reduced.

Its value as an aid to growers in marketing tobacco has been fully demonstrated. Although prior to 1936 a small fee was charged for tobacco inspection, during the years 1931 to 1935, inclusive, from 108 million to 186 million pounds of farmers' tobacco were sold annually by standard grades on auction markets. The Tobacco Inspection Act of 1935 has made it possible to expand the service and to put it at the disposal of growers without charge as rapidly as funds become available and additional personnel can be trained. The Act provides for three distinct services - demonstration, inspection, and market news.

The demonstration service is educational. It acquaints farmers with the objects of inspection and market news and how these services can best be used, and instructs them in the better preparation of tobacco for market so that it can be sold at the highest price consistent with quality.

1/ This information was taken from a circular written by Mr. Hugh W. Taylor, Senior Marketing Specialist, Agricultural Marketing Service, United States Department of Agriculture, Washington, D. C.

This work is accomplished through practical demonstrations on farms and through farmers' meetings. In cooperation with departments of vocational education, agricultural teachers are given special training so that tobacco marketing may be taught in rural high schools. Agricultural colleges, county agents, vocational teachers of agriculture, chambers of commerce and other civic and farm organizations further the service.

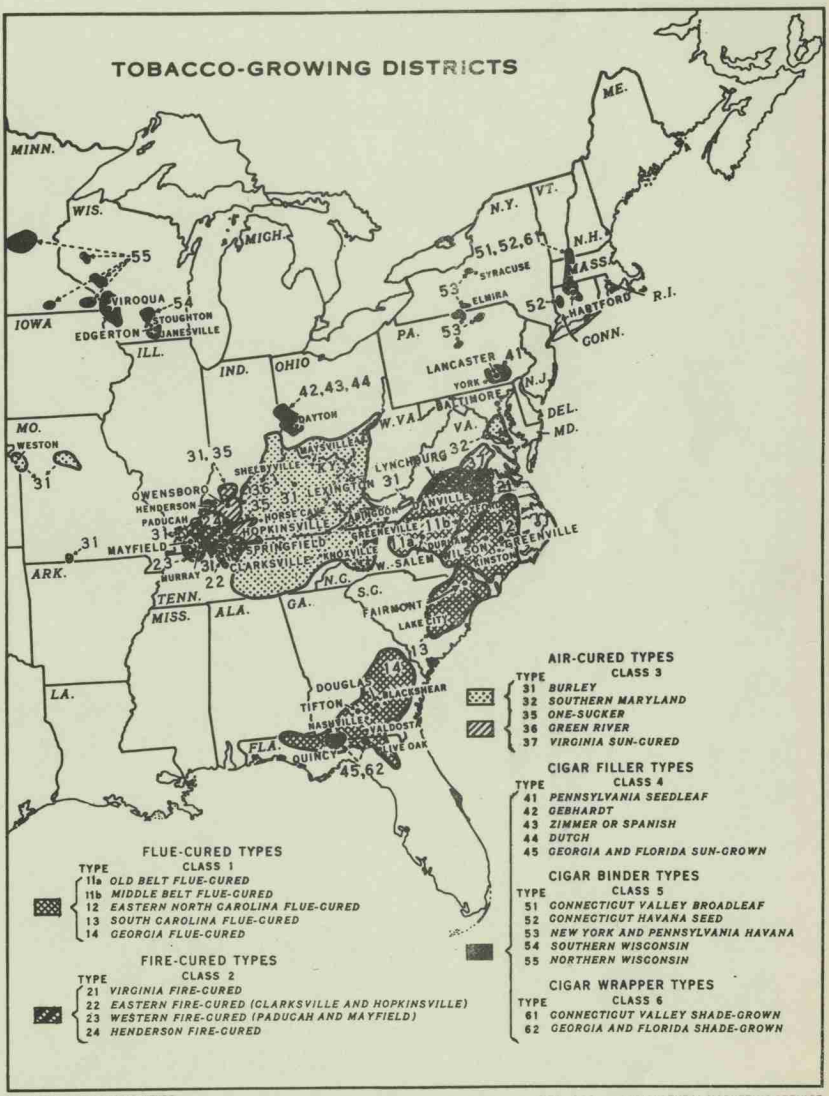
Standard Grades for Flue-Cured Tobacco

That the operations of the tobacco inspection service may be understood, it is necessary to have some knowledge of the system of grades used in classifying tobacco according to Federal standards. These grades are not difficult to understand.

Grades for tobacco are determined by the simple process of division and subdivision until a point is reached at which further subdivision is neither essential nor desirable. Each final subdivision is called a grade. The first division is made on the basis of distinct characteristics of tobacco caused by varieties, soils, climate, and methods of cultivation, harvesting, and curing. Each major division, based on distinct characteristics caused by these conditions, is called a class.

Each class is then subdivided into types. A type is defined as a division of a class of tobacco having certain common characteristics which permit its being divided into a number of related grades. Tobacco that has the same characteristics and corresponding qualities, colors, and lengths is treated as a type. Classes and types are necessarily based on rather broad distinctions.

The next subdivision breaks down each type into groups, or groups of grades. In the case of those types usually sold at auction, the group divisions are closely related to the position of the leaves on the plant. The trade terms for each group, except Wrappers, may vary with each class of tobacco and sometimes for types of a class.



U. S. DEPARTMENT OF AGRICULTURE NEG. 222 AGRICULTURAL MARKETING SERVICE

FIGURE 1

It will be seen by referring to Figure 2 that the normal groups for flue-cured tobacco are Lugs, Cutters, and Leaf. In crops of superior quality a fourth group known as Wrappers is selected. Wrappers may be from either the Leaf or the Cutter groups. In flue-cured tobacco most of the Wrappers are produced in certain parts of the Old Belt. In these areas the plants are generally topped low and the crop is usually harvested by cutting the whole plant rather than by priming the leaves as is done in other flue-cured districts where farmers aim at the production of tobacco suitable for smoking purposes.

From Figure 2, it will also be noted that the Lug group normally consists of those leaves at the lower part of the plant. Lugs are usually thin to medium in body and low in oil, and show a material amount of injury characteristic of leaves grown near the ground. Leaves of this group are shorter than other leaves on the plant except the top leaves. They usually have dull finish and lack the lively color characteristic of Cutters, and Choice and Fine quality leaf. Lugs are made up of ripe, grainy lower leaves. The leaves at the very bottom of the plant are usually harvested before they are ripe. If left to mature they may be lost. These leaves as harvested are therefore premature; they lack grain, and are known in the trade as Primings. Primings are treated as a sub-group of Lugs. The chief differences between Lugs and Primings are: (1) Lugs are ripe whereas Primings are premature, (2) Lugs are grainy whereas Primings lack grain, and (3) Lugs have the sweet odor characteristic of flue-cured tobacco whereas Primings have an earthy odor.

Cutters are the leaves on the plant next above the Lug leaves. Cutters are thin to medium in body. The leaves of this group are usually the longest and widest on the plant. They have light-color shade and vary in finish from bright to dull according to quality. Cutters are further distinguished from Lugs by being comparatively free from injury characteristic of leaves grown near the ground. The Choice and Fine qualities of Cutters are the smoothest leaves on the plant except Wrappers. Cutters are further distinguished by the wrinkled, crepe-like appearance of the leaf surface. In curing, leaves of the Lug and Cutter groups tend to roll up so that lots of Lugs and Cutters show, on inspection, very little of the stems or midribs.

Tobacco of the Leaf group is medium to heavy in body. Leaves of this group generally have a higher percentage of oil and wax (gum) than those of the Cutter group. Except those of Choice quality, the leaves of this group are narrower than Cutters and generally have larger stems (midribs) and lateral veins. Tobacco of this group usually is not so smooth as Cutters, and does not have as light-color shade nor as high finish. In curing, leaves of this group normally fold flat, thereby showing prominently the stems or midribs. The leaf surface does not have the wrinkled, crepe-like appearance characteristic of Cutters. Tobacco of this group varies in maturity from ripe to fairly ripe according to quality. In some cases the leaves become over-ripe before being harvested.

Over-ripe leaf is of thinner body, has more prominent fibers, is non-elastic, low in oil, very grainy, porous, and shows a considerable amount of injury characteristic of leaves that have passed beyond the normal

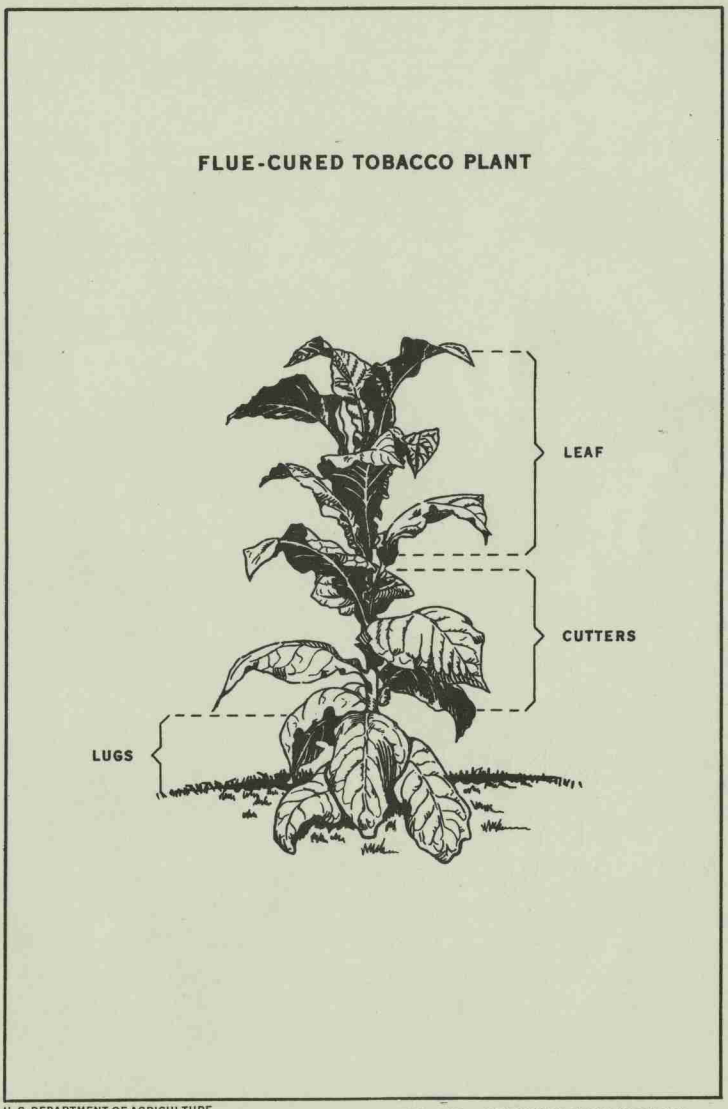


FIGURE 2.- APPROXIMATE STALK POSITIONS OF THE VARIOUS GROUPS OF GRADES.

stage of maturity. Over-ripe leaf is described as smoking leaf and is treated as a sub-group of Leaf tobacco in the flue-cured types. By weight, the Leaf group will usually comprise fifty percent or more to the crop.

Wrappers are selected from either Leaf or Cutters. Wrappers are those leaves that are silky to smooth, elastic, oily, ripe, firm, and strong. They have bright finish, blending fibers, and not more than five percent of injury. They are, therefore, almost perfect leaves. The main difference between Wrappers and Choice qualities of Leaf and Cutters is the degree of elasticity. Wrappers must be elastic whereas Leaf and Cutters of first quality need be only stretchy. Wrappers make up a selected group whereas Leaf, Cutters, and Lugs are natural groups which, under normal conditions, appear on all plants of flue-cured varieties.

The group division is the first and basic factor of grades for tobacco. In examining flue-cured tobacco the physical characteristics detailed above are used to determine the several groups. In addition to physical differences, there is, as shown by Darkis 1/ and his co-workers, a definite relationship between the chemical composition and the stalk position (group of tobacco). They have pointed out the correlation between the position of the leaves on the stalk (group) and the usage of flue-cured tobacco in its manufactured forms.

The next subdivision divides each group into qualities. The terms used to describe quality are Choice, Fine, Good, Fair, Low, and Common. Each of these is based on a combination of elements that go to make up quality of tobacco.

In flue-cured tobacco the final subdivision is on the basis of color. Each quality of the several groups is divided into colors as required. The terms used to describe color in flue-cured tobacco are Lemon, Orange, Red, Dark red, and Green.

The group, quality, and color are combined to form the grade which describes a lot of tobacco. Below are listed the groups, qualities, and colors used in grades for flue-cured tobacco:

Groups	Qualities	Colors
Wrappers	Choice	Lemon
Leaf	Fine	Orange
Cutters	Good	Red
Lugs	Fair	Dark red
Non-descript	Low	Green
Scrap	Common	

Any combination of group, quality, and color can be made to form a grade. For instance, Cutters of Good quality in Orange color constitute a grade. As this method of expressing grades is too cumbersome for practical purposes, symbols are used for each group, quality, and color. This simplifies the use of such a system of grades. The symbols and the words they stand for (groups, qualities, and colors for flue-cured tobacco) are given

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1/ Industrial and Engineering Chemistry, Vol. 28, October 1936.

as follows:

Groups	Qualities	Colors
A - Wrappers	1 - Choice	L - Lemon
B - Leaf	2 - Fine	F - Orange
C - Cutters	3 - Good	R - Red
X - Lugs	4 - Fair	D - Dark red
N - Non-descript	5 - Low	G - Green
S - Scrap	6 - Common	

Substituting symbols for words, Cutters of Good quality in Orange color would be written C3F. The first symbol, C, indicates the group, the second symbol, 3, denotes the quality, and the third symbol, F, describes the color. Each symbol used in a Federal grade for tobacco has therefore a definite and known meaning.

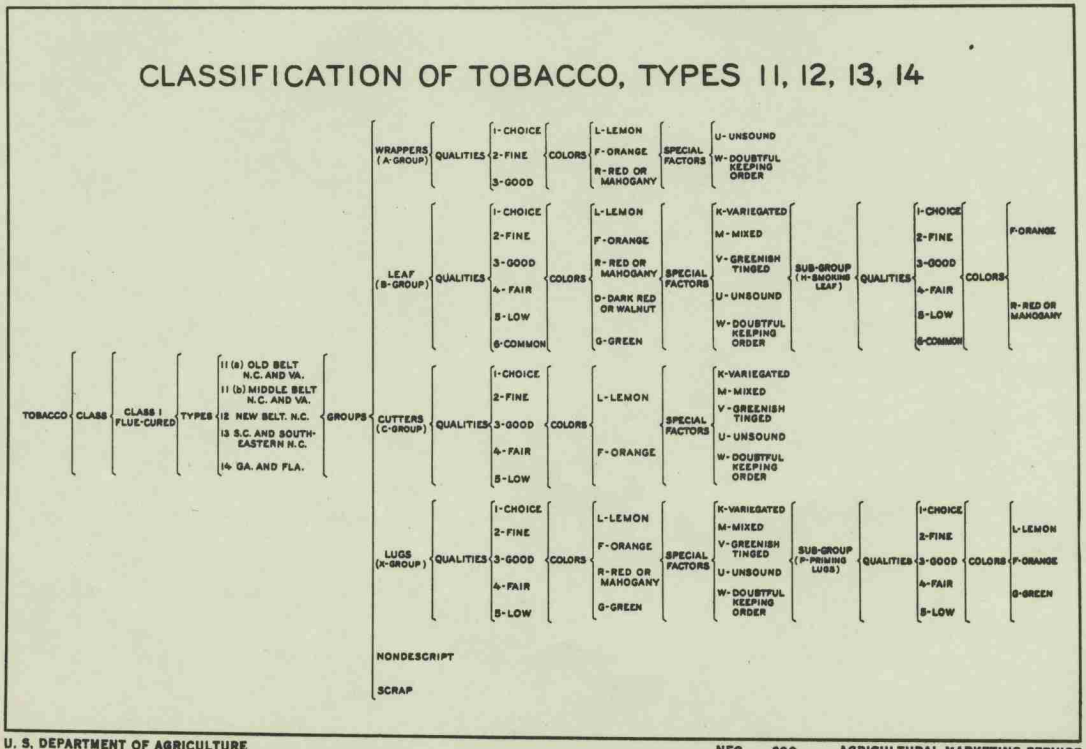
To make this clear, assume that we are to determine the grade of a single lot of tobacco. Upon examination we find that it is clearly a Lug, so we know that the first symbol of the grade should be "X". Examining it more closely we find that it is thin to medium in body, is fairly grainy, has a dull finish, and is unrough. This indicates it is a Good Lug, or in other words, third quality. If it had been thoroughly ripe, fairly smooth, and of normal finish, it would have been Fine or second quality. If it had been a smooth lug of clear finish and fairly oily, it would have been Choice or first quality. Going the other way, we might have found that this Lug was only Fair, or fourth quality; or just Common, or fifth quality. But taking all the factors into consideration we have found it to be Good or third quality, so we add a "3" as the second symbol and have "X3". This still is not complete for it does not indicate the Color. This particular lot we find is a light or Lemon color, so we add the symbol "L" making it "X3L". Now we have a complete description of the tobacco. As we shall find later, it is possible to consult the market news reports and see what prices are being paid for other tobacco of the same description.

The federal system of grades for tobacco differs from private systems in two respects. In the first place the Federal system is, and must be, more comprehensive since it must describe any and all lots of tobacco offered for sale, whereas any private system applies only to the grades of tobacco purchased by the particular firm that uses the system. In the second place, each grade symbol has a definite meaning that is known to the general public.

The above groups, qualities, and colors, in combination, do not always describe accurately a lot of tobacco that has some unusual characteristic or some particular phase of quality or color. To describe such lots of tobacco special factors are used in addition to the usual grade symbols. For example, B4FW describes Leaf tobacco, of Fair quality, Orange color, in doubtful keeping order.

Figure 3 gives details of the groups, qualities, colors, and special factors used in connection with the grades for flue-cured tobacco.

Farmers are sometimes confused by the fact that the several groups, qualities, colors, and special factors can be combined to form a large number of grades. They say that too many grades are recognized because the total number cannot be applied to their particular crops. It should be remembered that grades are used only as required.


CLASSIFICATION OF TOBACCO, TYPES 11, 12, 13, 14
TOBACCO
CLASS
CLASS I FLUE-CURED
TYPES
11 (a) OLD BELT N.C. AND VA.
11 (b) MIDDLE BELT N.C. AND VA.
12 NEW BELT. N.C.
13 S.C. AND SOUTH-EASTERN N.C.
14 GA. AND FLA.
GROUPS
WRAPPERS (A-GROUP)
QUALITIES
1-CHOICE
2-FINE
3-GOOD
COLORS
L-LEMON
F-ORANGE
R-RED OR MAHOGANY
SPECIAL FACTORS
U-UNSOUND
W-DOUBTFUL KEEPING ORDER
LEAF (B-GROUP)
QUALITIES
1-CHOICE
2-FINE
3-GOOD
4-FAIR
5-LOW
6-COMMON
COLORS
L-LEMON
F-ORANGE
R-RED OR MAHOGANY
D-DARK RED OR WALNUT
G-GREEN
SPECIAL FACTORS
K-VARIEGATED
M-MIXED
V-GREENISH TINGED
U-UNSOUND
W-DOUBTFUL KEEPING ORDER
SUB-GROUP (H-SMOKING LEAF)
QUALITIES
1-CHOICE
2-FINE
3-GOOD
4-FAIR
5-LOW
6-COMMON
COLORS
F-ORANGE
R-RED OR MAHOGANY
CUTTERS (C-GROUP)
QUALITIES
1-CHOICE
2-FINE
3-GOOD
4-FAIR
5-LOW
COLORS
L-LEMON
F-ORANGE
SPECIAL FACTORS
K-VARIEGATED
M-MIXED
V-GREENISH TINGED
U-UNSOUND
W-DOUBTFUL KEEPING ORDER
LUGS (X-GROUP)
QUALITIES
1-CHOICE
2-FINE
3-GOOD
4-FAIR
5-LOW
COLORS
L-LEMON
F-ORANGE
R-RED OR MAHOGANY
G-GREEN
SPECIAL FACTORS
K-VARIEGATED
M-MIXED
V-GREENISH TINGED
U-UNSOUND
W-DOUBTFUL KEEPING ORDER
SUB-GROUP (P-PRIMING LUGS)
QUALITIES
1-CHOICE
2-FINE
3-GOOD
4-FAIR
5-LOW
COLORS
L-LEMON
F-ORANGE
G-GREEN
NONDESCRIPT
SCRAP
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NEG. 200
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Figure 3

Operation of Inspection Service

On markets where the inspection service operates, the procedure is as follows:

(1) Growers deliver their tobacco to the market of their choice and to any warehouse they may select.

(2) The tobacco is arranged for sale on flat baskets.

(3) Each lot, or basket, is then weighed and a warehouse ticket is placed on the lot. The ticket shows the name of the seller and the number of pounds of tobacco in the lot, and may give other information for the purpose of identification. Space is provided on the ticket for the name of the buyer, the grade symbol of the buyer, and the price at which the tobacco is sold. It also has a space in the upper-right corner for the Federal grade (Fig. 4).

(4) The lots, or baskets, are placed in line on the warehouse floor.

(5) As soon as there is good light, the official inspectors start at the beginning of the "break" ahead of the sale, and make a proper examination of each basket of tobacco.

(6) Having made a careful examination, the inspector writes on the ticket, in the space provided, the Federal grade that correctly describes the tobacco in the lot, and signs his initials. If the tobacco inspected is Leaf of Fair quality in Red color, the inspector writes B4R. If the tobacco is made up of Cutters of Fine quality in Lemon color, the grade symbols are C2L. If the lot is made up of Lugs of Good quality in Orange color the grade mark is X3F. The warehouse ticket then becomes a certificate of grade and shows the type of tobacco as well as its group, quality, and color.

(7) When the auction starts on each lot, the grade of the lot is announced for the information of all parties interested in the transaction.

Tobacco Market News Service

Farmers are primarily concerned with production. The preparation of tobacco for sale is a major part of tobacco production and requires much time. The average farmer cannot spend enough time on warehouse floors to keep posted on the approximate value of the different grades of tobacco. In the past, informational service has not been supplied growers to acquaint them with prices being paid for tobacco although this knowledge is essential to the equitable sale of their tobacco.

Studies made by the Agricultural Marketing Service show that the greater part of the tobacco sold at auction is at prices within the normal range for each grade and which are, therefore, in line with equitable prices as established by sales. The studies also show that some lots sell con-

BLANK'S

NO. 163

BASKET 23245

TOBACCO INSPECTION CERTIFICATE

This tobacco inspected by the U. S. Department of Agriculture under the Tobacco Inspection Act, is certified to be

TYPE 12

GRADE _____

_____ By _____

Date Inspector

PLANTER John Doe

PRICE $_____ 204 Lbs.

BUYER _____

BLANK'S

NO. 163

BASKET 23245

TOBACCO INSPECTION CERTIFICATE

This tobacco inspected by the U. S. Department of Agriculture under the Tobacco Inspection Act, is certified to be

TYPE 12

GRADE X3F

11-7-36 By M.M.V.

Date Inspector

PLANTER John Doe

PRICE $ 20 204 Lbs.

BUYER W X

Figure 4. TOBACCO WAREHOUSE TICKETS:

UPPER - Before inspection and sale.

LOWER - After inspection and sale.

siderably higher than the normal price range for the grade, and about the same or a larger percentage of the lots sell in the price range of tobacco that is two qualities lower in grade. In both cases these prices are entirely out of line with equitable sales. In the one case the seller receives too much for his tobacco and in the other he receives far too little. It is therefore evident that whereas one grower, for some unexplained reason, is paid a premium for his tobacco another grower is likely to be penalized. It is this situation which causes so much dissatisfaction and which could be eliminated by proper and consistent use of the inspection service.

The value of the inspection service lies in the fact that the certificate of grade on the warehouse ticket provides tobacco growers with unbiased information regarding the grade or quality of each lot of tobacco offered for sale. In connection with the price reports, this information gives them a basis for making an intelligent decision on whether or not to accept a bid.

The Tobacco Market News Service operates in connection with the inspection service. After a lot of tobacco has been sold, and has been so entered on the warehouse books, a coupon is taken from the warehouse ticket on each basket of tobacco. The coupons, showing the Federal grade and the price at which each lot has been sold, are forwarded to a central office where they are sorted according to grade and the price for each grade is calculated. These prices are then issued in the form of daily and weekly price reports. (Table 1, pages 56 and 57).

The combination of inspection service and market news service gives farmers information as to the grade of each lot of tobacco offered for sale and the average price at which each grade has actually been selling. The average price is ascertained by combining the prices of all lots of each grade and calculating the average for the whole number of lots sold. Some of the lots had probably been sold at prices above the average and others at prices below the average. Each grade will have a high side and a low side so that some range in price can be reasonably expected. Just how much variation there should be depends upon the spread in prices between grades. By turning to the weekly price report (Table 1) it will be seen that the average prices for Lugs during week ending January 11, 1940, were as follows: X1L, $26 per 100 pounds; X2L, $20.50; X3L, $17; X4L, $12.25; and X5L, $9.50.

On the basis of these prices what would be the expected range in price of Lugs, Fine quality, Lemon color (X2L)? This is found by a simple calculation. There will be little difference in the prices for tobacco between the low side of X1L and the high side of X2L. The difference between the average prices of these two grades is ($26.00 less $22.50 equals $3.50) $3.50. One-half of the difference is $1.75. If $1.75 is added to the average price of X2L ($20.50 plus $1.75 equals $22.25) the high side of the grade would be worth approximately $22.25 per hundred pounds.

Likewise the difference in price between X2L and X3L ($20.50 less $17.00 equals $3.50) is $3.50. One-half of this is $1.75. If $1.75 is subtracted from $20.50, the low side of X2L is found to be approximately $18.75. At these prices X2L would have a range in price from $22.25 to $18.75 per hundred pounds. The range for other grades can be found in the same way.

This information will enable every farmer to know after his tobacco is sold whether the prices, lot by lot, are in line with those already established, on a grade basis, by the buyers. No further information is necessary to enable farmers to market their tobacco on a basis of fair competition.

The way in which this information is used determines its value to individual tobacco growers. Actual instances will provide the best illustrations. In one instance a farmer offered a lot of 212 pounds of tobacco which was graded C5L by the inspector. The lot was bid in at $19.00. The price report showed that C5L sold at an average of $24.00 on the preceding day. The farmer rejected the bid and again offered the tobacco for sale on the same day and on the same warehouse floor. On the resale the lot was bid in at $24.00, or an increase of $5.00 per hundred pounds. As the lot weighed 212 pounds the increase of the resale above the original sale gave the farmer a profit of $10.60 which amounted to an increase of 26.3 percent. This farmer used the information obtained from the inspection and market news services properly and profited thereby.

In another case a farmer offered a lot of 216 pounds of tobacco which was graded H6R. The lot was bid in at $16.00 and, although the price report showed that on the previous sales day this grade sold at an average of $14.00 per hundred pounds, the farmer rejected thebid. The tobacco was again offered for sale on the floor of the same warehouse and on the same day. On the resale the tobacco was bid in at $15.00 or at a loss of $2.16 which amounted to a decrease of 6.2 percent. This farmer was probably misled by thinking that his tobacco was of better quality than that indicated by the grade on the warehouse ticket or else entirely disregarded or did not understand the information obtained through the inspection and market news services.

Records of sales and resales, compiled by the Agricultural Marketing Service, show that when bids are materially below the price range per grade farmers make money by rejecting the bids and reselling the tobacco. The data also show that when bids are within the price range per grade or above the average price, for the grade, farmers seldom profit by rejection but usually lose money. The point is that if farmers are to benefit from the operations of the inspection and market news services they must apply the information obtained. No one can refute the statement that information that enables farmers to reject low bids and resell tobacco at substantially higher prices is of great value to producers in marketing their tobacco.

In brief, then, these services are designed and operated to supply tobacco growers with information that will enable them to sell their crop at the highest prices consistent with quality and market requirements.

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Marketing Service
North Carolina Department of Agriculture
Division of Markets, Cooperating

Raleigh, North Carolina
January 13, 1940

WEEKLY TOBACCO MARKET PRICE REPORT - TYPE 11(b)
MIDDLE BELT FLUE-CURED

Average prices per hundred pounds by United States grades for Middle Belt flue-cured tobacco for the week ending January 11 were as follows:

Grade Description	Grade Symbol	Week Ending Jan. 11, 1940
Leaf		
Choice Lemon	B1L	$37.00
Choice Orange	B1F	35.00
Fine Lemon	B2L	30.00
Fine Orange	B2F	28.00
Good Lemon	B3L	22.50
Good Lemon (Green Tinge)	B3LV	21.50
Good Orange	B3F	20.00
Good Orange (Green Tinge)	B3FV	20.00
Fair Lemon	B4L	19.00
Fair Lemon (Green Tinge)	B4LV	16.00
Fair Orange	B4F	16.50
Fair Orange (Green Tinge)	B4FV	14.00
Fair Orange (Off-Color)	B4FK	10.50*
Fair Red	B4R	14.50
Fair Green (Light Shade)	B4GL	13.50*
Fair Green (Medium Shade)	B4GF	12.50*
Low Lemon	B5L	14.50
Low Lemon (Green Tinge)	B5LV	12.50
Low Orange	B5F	12.25
Low Orange (Green Tinge)	B5FV	10.00
Low Orange (Mixed)	B5FM	10.75*
Low Orange (Off-Color)	B5FK	8.25
Low Red	B5R	10.25
Low Red (Off-Color)	B5RK	8.00*
Low Green (Light Shade)	B5GL	9.50
Low Green (Medium Shade)	B5GF	8.25
Common Lemon	B6L	9.25
Common Orange	B6F	8.25
Common Red	B6R	6.75
Common Green (Light Shade)	B6GL	7.75
Common Green (Medium Shade)	B6GF	6.50
Smoking Leaf		
Choice Orange	H1F	30.00*
Fine Orange	H2F	27.00*
Good Orange	H3F	20.50
Fair Orange	H4F	17.50
Low Orange	H5F	13.50
Low Red	H5R	12.75*
Common Orange	H6F	9.50
Common Red	H6R	9.25*

Table 1. SAMPLE OF WEEKLY PRICE REPORT (see Next Page)

(Continued)

Grade Description	Grade Symbol	Week Ending Jan. 11, 1940
Cutters		
Fine Lemon	C2L	$34.00*
Good Lemon	C3L	30.00*
Good Orange	C3F	30.00*
Fair Lemon	C4L	26.00
Fair Orange	C4F	26.00*
Low Lemon	C5L	24.00*
Low Lemon (Green Tinge)	C5LV	21.50*
Low Orange	C5F	23.00*
Lugs		
Choice Lemon	X1L	26.00*
Choice Orange	X1F	25.00*
Fine Lemon	X2L	20.50
Fine Orange	X2F	20.50
Good Lemon	X3L	17.00
Good Lemon (Green Tinge)	X3LV	16.50*
Good Orange	X3F	16.00
Good Orange (Green Tinge)	X3FV	15.50*
Good Orange (Mixed)	X3FM	16.00*
Good Orange (Off-Color)	X3FK	11.75*
Good Green (Light Shade)	X3GL	12.75*
Good Green (Medium Shade)	X3Gf	12.25*
Fair Lemon	X4L	12.25
Fair Orange	X4F	11.50
Fair Orange (Mixed)	X4FM	11.25*
Fair Orange (Off-Color)	X4FK	9.50*
Fair Green (Light Shade)	X4GL	9.75*
Fair Green (Medium Shade)	X4GF	9.25*
Low Lemon	X5L	9.50
Low Orange	X5F	8.75
Low Green (Medium Shade)	X5GF	7.50*
Primings		
Choice Lemon	P1L	24.50*
Choice Orange	P1F	24.50*
Fine Lemon	P2L	22.50*
Good Lemon	P3L	19.00*
Good Orange	P3F	18.50*
Fair Lemon	P4L	13.50*
Fair Orange	P4F	12.50*
Low Lemon	P5L	8.25*
Low Orange	P5F	7.75*
Non-Descript		
Medium (Leafy)	N2B	5.50
Trashy (Leafy)	B3B	4.00
Best (Luggy)	N1X	6.00
Medium (Luggy)	N2X	4.50*
Medium (Green)	N2G	5.00
Trashy (Green)	N3G	3.50

* Represents average for season through January 11, 1940.

Why the Government Acts

It may be asked, why cannot warehouse starters and buyers determine the grade of tobacco as well as Government inspectors? Studies show that in the majority of cases they can, and do, since the bulk of sales are made at prices within the normal range for the several grades. But there are the sales at abnormally low prices to be explained.

One explanation may be found in the rate at which tobacco is sold at auction. The normal rate at which flue-cured tobacco is auctioned is 360 lots an hour, or 1 lot each 10 seconds. When sales are usually heavy the rate is faster and when sales are light the rate may be slower. Under normal conditions the warehouse starters and buyers must determine the group, quality, and color of a lot of tobacco every 10 seconds. It is extremely doubtful whether these determinations can be accurately and consistently made at this rate of speed during the whole period of sales. To a large extent the inequality in prices for the same grade of tobacco may be explained by errors in judgment on the part of starters and buyers, because of the speed at which tobacco is sold.

Another important factor is the light under which tobacco is sold. Some tobacco may be placed on the warehouse floor where the light is unsatisfactory. It may be in a dark corner, or under a skylight through which the sun shines directly on the tobacco. Both conditions render accurate determinations very difficult, and often adversely affect the sales price of tobacco. Neither of these unfavorable conditions - rate of sales or unfavorable light - can be directly attributed to either the starters or the buyers, but the ill effects of both can be reduced materially by inspection service.

Under Federal inspection, to eliminate errors in judgment caused by speed and unfavorable light, at least three inspectors are provided for each sale and during rush sales four inspectors are generally on hand. Furthermore, as they begin inspecting tobacco some time before the sale starts they are not rushed and are able to make more thorough examinations, and consequently more accurate and consistent determinations of grade, lot by lot. In addition, samples of those lots of tobacco under unsatisfactory light can be carried to proper light for inspection and determination of grade.

Question of Prices

Farmers frequently ask whether the price of tobacco is increased through the operations of the inspection and market news services.

In certain instances the price is increased and in others it is not. The value of tobacco is determined by the soil and the climate under which the tobacco is grown, the cultural practices used, the stage of maturity at which the tobacco is harvested, the skill with which it is cured, and the way in which it is prepared for market. The grade mark should be an index to market price, as it describes the group, quality, and color that have resulted from the factors mentioned. In the case of those lots of tobacco that sell within the price range for their grade or higher, it can be assumed that the tobacco is selling at or above established values and that the

grade announced has not increased the selling price.

But there are exceptions. Sometimes the announcement of the grade may attract attention to a lot which otherwise would be overlooked; in such cases prices are thereby directly increased. In the case of lots that are bid in at prices considerably below the average for their grade, the price can be materially increased by the proper use of the information supplied by the inspection and market news services. If the bids are rejected and the tobacco is resold, the lots generally sell within the price range for their grades and the sales price is appreciably increased in such cases.

Farmers should realize that both services are informational. The inspection service does not promote sales; it supplies information regarding the quality of tobacco offered for sale. The market news service does not establish prices; it only records current average prices established by sales of tobacco. If the service is properly used it will go far toward preventing the losses now suffered by growers when tobacco is knocked down at less than its current market value. If the information is not applied it will, of course, have no influence on prices.

Farmers often say that the services have helped them, when their tobacco sells at average prices or higher per grade, as shown in the price reports. This is especially true when the grades assigned to lots are higher than the farmers expected. On the other hand, they are prone to complain that the services have been of no value when their tobacco is bid in at prices below the averages for the several grades.

Such conclusions are not entirely justified. It is often true that the announcement of the grade to the buyers helps the sale, but it is also true that in many cases, possibly in most cases, the price would have been about the same even if the tobacco had not been inspected. The important point to bear in mind is that the object of inspection and market news service is to let the farmer know whether the price offered is right or whether it is too low. When tobacco is inspected and the lots are bid in at prices materially below the average for their grades, farmers are disappointed and inclined to find fault with the inspection service. In the latter case they have unbiased information that their tobacco has been undersold. The trouble here is not with the service but with themselves. The service made it possible for the farmers to know that they were not getting a fair price for their tobacco but they failed to use the information.

This kind of information can be obtained only through the inspection and market news services. If used properly it is of direct commercial value to farmers but if it is ignored the benefits of the inspection and market news services are largely lost.

In addition to the practical benefits that individual growers should derive from inspection and market news services, it has often been found that these services contribute to smoother running sales and a more even market.

CHAPTER XVI

AAA AND ITS RELATION TO THE TOBACCO INDUSTRY 1/

The Agricultural Adjustment Administration was set up because of the reduction in growers' purchasing power. In 1932 the largest farm population in the Nation's history had the smallest farm cash income reported in twenty-six years for which records are available. Farm prices of flue-cured tobacco dropped more than one-half from 1919 to 1920. The further decline was particularly rapid from 1926 to 1931. As a result of continued fall, prices for 1930, 1931, and 1932 were less than one-half the average of the preceding ten years. This curtailment of purchasing power was considered to be the direct result of disparity between the prices received for the commodity by producers and the prices paid for articles purchased. It was believed that this disparity existed because growers' prices were too low, and this situation was attributed to the accumulation of excessive stocks and to the failure of producers to receive an equitable share of consumers' expenditures for tobacco products.

That the farmer had not received an equitable portion is shown by data compiled by the Tobacco Section of the Agricultural Adjustment Administration on the total gross amounts received by the farmers for tobacco used in domestic manufacture and the total profits available for distribution as dividends by the thirty-four leading manufacturers over the period 1923 to 1932. As returns to growers declined, profits to manufacturers were automatically enhanced under the conditions of limited competition in the sale of manufactured products. In 1932 the farmers' receipts amounted to sixty-eight million dollars whereas manufacturers' profits were one hundred forty-six million dollars.

The Triple-A had for its immediate objectives: (1) gradual reductions in carry-overs by securing from growers commitments to make specified reductions in acreage and production, thereby offsetting the effects of curtailments in domestic and foreign outlets; (2) supplement growers' returns in the way of monetary rewards for cooperation; and (3) correction of market conditions unfavorable to the farmer.

A move in the direction of correcting unfavorable market conditions was started by the United States Department of Agriculture in 1929, when it began inspecting tobacco according to standard grades. The inspection service undertook the inspection and certification of the grade of tobacco, before sale, at auction markets. Prior to 1936 a small fee was charged for inspection. During the years 1931-1935, inclusive, from 108 million to 186 million pounds of farmers' tobacco were sold annually by standard grades on auction markets.

The tobacco Inspection Act of 1935 made it possible to expand the service and to put it at the disposal of the growers without charge as rapidly as funds become available and additional personnel can be trained. The Act provides for three distinct services - demonstration, inspection, and market news. This last service is accomplished through the medium of the Tobacco

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1/ This information was taken from Smoky Future by Mr. Nat C. Browder, who is associated with The North Carolina Writers Project, Raleigh, N. C.

Market Review, which gives detailed information on sales, prices, production, etc., of the various types of tobacco. During the season 1939-40 the Inspection Service graded a total amount of 450 million pounds of tobacco - which is ample proof that the service is meeting with the approval of the growers.

Among the general methods employed by the AAA to achieve limitation of production were: (1) establishing a base from which reductions were to be made, which ultimately included both a "base tobacco acreage" and a "base tobacco production" for each contract signer; (2) specifying the reduction required, more commonly by designing a percentage of base acreage to be kept out of production; and (3) designating the payments to be made in return for the reduction required.

In its application to tobacco the AAA was supplemented in 1934 by the Kerr-Smith Act, which was designed to prevent non-signers from sharing in the financial benefits secured through the operation of the Adjustment Act. Under its powers a tax was collected upon the sales of tobacco by growers who did not participate in the program for reducing production. The rate of tax levied by this measure was one-third of the price at which the tobacco was sold, but with the provision that the rate might be reduced by the Secretary of Agriculture to not less than one-fourth of the price.

From a whole analysis of the tobacco programs from 1933 to 1935 it is concluded that growers' incomes were materially enhanced by them. In part this enhancement resulted from the distribution of more than 56 million dollars as benefit payments during the period, of which fifteen million went to North Carolina growers. The remainder resulted from the substantial increase of prices under the program which, more than offset the volume curtailments that were effected. While estimates of these gains can be made only within wide limits, it seems probable that they amounted to something between one hundred and one hundred fifty million dollars. Thus growers' income from tobacco production, including benefit payments, were probably from one hundred fifty to two hundred million dollars larger than they would have been in the absence of any adjustment programs.

In 1935 a three-year plan was submitted to the growers and approved by approximately ninety-eight percent of them. In January 1936, the Supreme Court of the United States invalidated the Kerr-Smith Act, declaring this type of regulated production unconstitutional. Congress then enacted what is known as the Soil Conservation and Domestic Allotment Act, which provided for an Agricultural Conservation Program under which special allotments would be set up for basic commodities; such as, cotton, tobacco, peanuts, etc.

During 1936 and 1937 participation in the Agricultural Conservation Program was entirely voluntary and the producers that cooperated received benefit payments. However, in 1937 a considerably less number of growers participated, upon discovery that it was a voluntary program.

In 1938 Congress made it possible for the farmers to decide for themselves whether or not they wanted to regulate marketing of tobacco. A plan was submitted to the farmers whereby a penalty would be placed on tobacco marketed in excess of the marketing quota established for the farm and in order for the plan to be in effect it was necessary for two-thirds or more

of the growers voting in the referendum to favor marketing quotas. The plan was approved by the growers when the referendum was held. However, the 1938 crop failed to bring a better average price than the crop a year before which, in part, may have led the farmers to abandon control the next year.

The failure of the farmers to vote the necessary two-thirds majority in the 1938 referendum resulted in 1939 in the largest crop of flue-cured tobacco on record, and an average price of $15.66 per hundred pounds, or the lowest general average since 1932. One other factor complicated the 1939 situation. The British trade withdrew suddenly from the market, making the tobacco situation acute. However, the Government was able to work out a loan arrangement with export companies on an optional basis. Under this arrangement one hundred seventy-five million pounds of the export type of tobacco was purchased on the markets, which was financed by the Commodity Credit Corporation.

During the fall of 1939, a referendum was again conducted to decide whether or not the farmers would agree to regulate their production of tobacco in 1940 - quotas were voted and the present tax rate is ten cents per pound on all tobacco sold from land above the allotted acreage. The result is an estimated reduction of almost one-half in the size of the 1940 crop, estimated at 465,650,000 pounds. However, as the current marketing season opens, growers are confronted by large supplies remaining from 1939 and further complications of the export situation. Present indications are that buyers for British trade and the trade with continental European countries will not operate on this year's market unless some arrangements similar to the purchase and loan plan of 1939 is put into effect. This phase of the problem is utterly unpredictable. It awaits the outcome of the present European struggle and upon post-war economic and diplomatic relationships.

On July 20, 1940, about eighty-six percent of the flue-cured tobacco farmers of North and South Carolina, Virginia, Georgia, Florida, and Alabama voted to extend Government control for another three years. Mr. J. B. Hutson, Assistant Administrator of the Agricultural Adjustment Administration, assured the growers throughout the flue-cured belt that under the three-year control program the Government will make the necessary purchases of surplus tobacco to keep fall prices at the same average price received last year. On the basis of predictions made for 1940 production the government will be required to purchase approximately one hundred seventy-five million pounds. Domestic consumption being estimated at four hundred million pounds. Under the most favorable conditions it is not expected that foreign markets can take more than one hundred million pounds. Both Britain and China will be absent from the market, China at the present time having an enforced embargo.

The quota for 1941 was set early in July at five hundred fifty-six million pounds, with a proviso that the quota might be raised to six hundred eighteen million pounds if growers approved marketing quotas for three years in the July 20th referendum.

Conceivably the present enforced curtailment of the export trade may turn out to be one of the best things that has happened to the Nation's tobacco farmers. It should afford the department of Agriculture a much needed

opportunity to perfect its machinery for absolute control of production. In view of this conclusion we might breathe a sigh of relief if that were the whole story. Unfortunately, it is the superficial aspect of a larger problem.

That the Government has recognized this fact is apparent. Mr. Wallace wrote in 1938:

The present administration was faced with one million destitute farm families. The Program (for agriculture) grew out of certain deep-rooted maladjustments in our rural economy. The chief of these was a prolonged period of ruinous farm prices, careless and unscientific tillage practices, unsound tenure systems, a heavy burden of debt, indadequate acreage, and a long-continued wastage of our farm capital by soil erosion.

However general this summing up may be, it has its application to the tobacco farmers. In the phrasing of the Progressive Farmer:

The problem is eventually not a simple one of reduction of production. It is rather one of developing a rational program for agriculture, which takes into account such facts as foreign competition, use of land, displacement of cropper and farm laborers, interregional competition and the processing and marketing of farm products, and above all it is not a short-time or temporary problem but one which the tobacco farmer has been facing for over two decades, and one which he will be forced to face for the next decade.

One of the chief essential problems facing North Carolina agriculture and part of its tobacco problem, is an unsound tenure system. So much has been written about the tenant system, that it can hardly be profitable to enter into a detailed discussion. It is universally recognized as a problem which demands solution. Nor is it a new problem. It was burdensome a hundred years ago. The Southern Planter published the following in 1841:

Among the many causes which have operated greatly to the injury of the farming interest in Virginia, and aided in no small degree to exhaust our lands, may be mentioned the practice of giving overseers an interest in the crop, instead of stipulated wages. It is one of the many injudicious customs that continue to prevail in Virginia, notwithstanding that the circumstances which gave rise to and justified them may long since have ceased to exist.

In 1810 the population of North Carolina was 555,500 of which 168,824 were Negro slaves. In 1910, 42.3 percent of North Carolina farmers were tenants.

In the chief tobacco producing area, for the period 1880-1935, tenancy has increased from 45.9 to 73.3 percent of the farm population. In a social-economic survey made in Chatham County, North Carolina, in 1922, the average annual income among 329 farm families of all classes amounted to $424. The cash in circulation in homes of 51 white families was only 12 cents per day. The amount was considerably less among Negro share-croppers.

The traditional policy has been to ignore such facts, or that money-crops and the tenant-system go hand in hand. More often the general public has had only superficial knowledge of our tobacco industry. A typical example of sentimental misapprehension is the following description of a tobacco

market day in Greenville, North Carolina (the time is 1898):

The streets are well-nigh blockaded, the driveways of the warehouses completely full. All over the old broomsedge field, that a few years ago was the lair of foxes and rabbits, immense structures dot the ground. The smoke from numerous factories curling heavenward evidences the fact that active life, thrift and progress have taken the place of indifferent carelessness. The clang of a heavy bell at nine o'clock announces that a tobacco sale is about to begin, the auctioneer calls the buyers, the warehouseman throws off his coat and now the fun commences. From nine until four or five o'clock in the evening the sales continue, and when they are over the bank has paid to the farmers that day from $8,000 to $12,000. Late in the evening the whistles from the factories announce the end of the day's work, and the countless number of happy, contented and jolly souls wend their way homeward.

The cultivation of a single moneycrop can scarcely be classified as farming in an older agricultural sense. The farmer who has all of his eggs in a tobacco basket is as subject to bankruptcy as the operator of the smallest capitalistic enterprise. So much may be conceded for the man who owns his land. What of those who do not own land, and are subject, moreover, to frequent shifts from place to place? Such are not inclined to build up a substantial farm management system. They are more likely to indulge in farm programs that take as much as possible out of the soil in quick fashion. Farmers struggling under a load of interest or rental payments are constantly driven toward even more emphasis on cash crops. Land ownership is the most promising solution to the problem of establishing and maintaining sound, self-providing farm systems. However, there is no wide-spread trend in this direction.

In the past - even before 1800 - the North Carolina farmers had an alternative to tobacco. For almost three-fourths of the nineteenth century cotton constituted the chief money crop. The preference for cotton almost led to the abandonment of tobacco culture. However, during the period 1880 - 1890, the average value of cotton per acre in the eleven cotton growing states was less than $16. Figures for North Carolina in the same decade shows that an acre of tobacco brought the farmer three hundred percent more than an acre of cotton.

Thenceforth tobacco came once more into her own in North Carolina, reaching a peak in 1939 with a record production of over eight hundred million pounds. Even before the present War the surplus problems of cotton and tobacco farmers were pressing. Now the farmers are faced with the fact that markets for both cotton and tobacco are temporarily, at lest, gone, and those who have persistently engaged in the cultivation of these two cash crops are in grave danger of being left high and dry.

The extent to which Carolina farmers in the past have neglected to provide for such an emergency as they now face is revealed in the 1935 Farm Census. In North Carolina, twelve percent of the farmers raised no chickens, seventeen percent had no gardens, thirty percent produced no cattle, thirty-four percent no hogs, and thirty-five percent had no cows.

No one is able to say yet what type of program will or can be worked out for the tobacco farmers. It is not impossible that the present crisis will pass and that for a few years nothing much will be done about the problem of cash-crop farming. Eventually it will demand solution. An editorial in a recent issue of the Southern Planter advises:

Forget the cotton and tobacco bobanzas of a day that is past and turn to a safer, more serene system of farming - one that puts food, feed and soil fertility first. Hold on tenaciously to existing markets for cotton and tobacco, yes, but why waste plant food, man-power and, indeed, a civilization itself searching for the pot of gold at the rainbow's end. Why produce for a market that doesn't exist? The health of southern farm people, their happiness and their future place in the sun is entwined with a self-sufficient farming system. Go back to the cow, sow, and hen; have a home garden on every homestead; eat what you can and can what you can't ! Let our young people become a generation of husbandmen.

This advice can be followed by less than fifty percent of the Southern farmers! It must be remembered that in our chief tobacco producing area in this State, above seventy-five percent of the farmers have no place to keep a sow, cow and hen. They own no land. Moreover, practically all cash crop farmers lack training in balanced farming.

There is considerable evidence that the place of United States flue-cured tobacco in the world market was earmarked for shrinkage long before the outbreak of hostilities in Europe and elsewhere. In recent years there has been a decided trend toward tobacco production where tobacco is consumed, with concerted action in some countries to expand participation in world tobacco trade. In many cases this expansion of trade has represented economic activity of a governmental order. Broadly speaking, what has happened in Japan is fairly typical.

Japan has imported no tobacco from the United States since December 1937, and there is little prospect that it will take any in the future. During the first-half of 1938, Japan, for the first time in the history of the industry, exported more tobacco than it imported. Increasing exports have been the trend in recent years. Restrictions upon imports, imposed in 1937, have obviously aided the development of the trend. Interestingly enough, the general policy in Japan is a move toward increased production of American types of tobacco. This does not exclude the use of seed from the Philippine Islands for experimental purposes.

For many years there has been increased exports of American grown seed to all parts of the world. In 1939 a bill was passed by Congress, later vetoed, which forbade the exportation of seed. The object was to prevent duplication of American type tobacco on foreign soil; ordinarily, tobacco goes "native" in about three years. However, it is idle to suppose that consumer preference cannot be weaned from a particular type of tobacco. It may be recalled that prior to the first world war, Turkish cigarettes held the center of popularity. Since the war, of course, the general taste has been for a blended cigarette - an admixture of oriental tobaccos with domestic types. Already, at the beginning of 1940, the stage was set for a swing back

to oriental tobacco in England, which normally represented our country's chief outlet for bright leaf. Trade agreements between France, England, and Turkey called for large purchases of oriental tobacco. (France does not enter largely into the discussion because it has not in recent years purchased great amounts of tobacco from the United States. In 1935 French buying reached a low of nineteen million pounds. The French Government's late agreement to purchase not less than 26.5 million pounds of United States leaf tobacco annually, does not now seem to be consequential. In any case, the last named figure represents only a small percent of France's consumption needs.) It does not appear that what happens in Europe will materially affect the situation with regard to increased consumption of Turkish leaf.

Possibly in no other commodity has governmental intervention in trade been carried so far as in the case of tobacco. This intervention which takes the shape of monopoly control and revenue taxation measures, is of such long standing it has almost come to be accepted as a routine governmental function. Twice in 1939 the English import duty on tobacco was upped - by two shillings per pound each time. This fact alone would, under theoretically normal conditions, have done much to impair the position of our flue-cured tobacco in competition with other Empire sources. Taken together with absolute stoppage of imports there can be no expectation other than a considerable shift in England, from American to other types of tobacco.

The important consideration is the fact that in the past and present no government has hesitated to adopt policies best calculated to return the most revenue. It may be expected that future governments will follow the path worn in the rock with regard to tobacco. In the past we have built up our foreign market on consumer tastes. If that is lost, and it becomes simply a matter of tobacco, American growers and manufacturers cannot under existing standards compete with foreign labor in production for the world market. This fact has additional weight, particularly where governments having monopolies prefer to purchase cheaper grades in the interest of enhancing revenue, or to fortify some equally vital economic measure.

The outstanding producer of flue-cured tobacco, aside from the United States, is China. The flue-cured industry, introduced into China by English and American manufacturers in the interest of magnified profits from cheap Chinese labor, expanded from a production of eighty-five million pounds in 1926 to two hundred ten million pounds in 1937-38. It is of momentary concern only that under the impact of Japanese conquest, China's poundage dropped to eighty-one million pounds in 1939. Under Japanese dominion China has a better than even chance of becoming the chief producer for the flue-cured market tomorrow.

Other countries that produce flue-cured tobacco are Manchuria, Japan, Chosen, Southern Rhodesia, South Africa, and Canada. Some idea of the rate of expansion of the industry in these countries is seen in Japan's jump from nine million pounds in 1927 to sixty-eight million pounds in 1939. Similar expansion occurred in Canada where production increased from four million pounds in 1927 to seventy-five million pounds in 1938-39. Manchuria, beginning with a first crop of less than two million pounds in 1933, grew 12.5 million pounds in 1938-39. The figures just given are for flue-cured tobacco only, and do not include other types.

It has already been pointed out that there is likelihood of a shift in consumer preference as a result of the present war. This assumption may not be dismissed on the ground that foreign flue-cured tobacco is lacking in finer qualities. In any event, a pound of poor tobacco will make a tolerable substitute for a pound of good tobacco. At this point it is well to remember that aside from flue-cured the United States has not always in recent years led the rest of the world in tobacco production. In 1935, for example, India produced almost one and one-half billion pounds, leading the United States by more than 120 million pounds.

At the present time interest centers on Latin America as a future market. Apparently any developments in that direction must await arbitrary economic arrangements - any attempt to prophesy would be in the nature of speculation. However, a few comments may not be out of order.

Among the Latin American countries, Brazil is easily the chief producer of tobacco. The 1934-35 Brazil crop amounted to two hundred twenty-four million pounds. This figure followed a downward trend until 1938-39. In the past the major portion of Brazil's export tobacco went to German and Dutch markets. That this country has long enjoyed a share in the export market is revealed in the fact that even twenty years ago it was the third largest exporter of the world (with an export of eighty million pounds). The past practice in Brazil has been for the foreign commission houses to advance the money to the growers, who are always in debt, and to take the crop in payment for the loans. It is difficult to see how Brazil has anything to offer this country in the tobacco field - except competition. In passing, it may be noted that thus far the Brazilian attitude has been one of deep-seated preference for trade with Germany.

In the matter of United States trade with Latin American countries, (excluding the Republic of Panama, the Canal Zone, Puerto Rico, The Virgin Islands, Cuba, and the West Indies), one-half billion cigarettes and 2.5 million pounds of bright leaf constitute the export total for 1938. While these amounts are small some consolation may be taken from the fact that, whereas our general foreign market for unmanufactured tobacco has declined since 1930, our trade with Latin America has shown an upward trend during the same period. The upward trend may be explained as a result of the experimental use of bright tobacco for cigarettes. On the whole, Latin America is still growing the dark tobacco long used there.

The entire present situation adds up to a few disturbing facts. The national consumption of tobacco is around four hundred million pounds. North Carolina alone has the necessary facilities to produce twice that amount. American dealers have on hand approximately two billion pounds that may be classes as surplus tobacco. According to estimates, the present crop will contribute one hundred fifty or two hundred million pounds to that surplus. Thousands of tobacco farmers in North Carolina and elsewhere are wholly committed to the culture of tobacco, and as a consequence have nothing in the way of a substitute cash-crop to which they may turn immediately. The majority of the producers in North Carolina are landless, and dependent upon this one crop for a means of life itself.

The situation admittedly is not as gloomy, however, as it seems. The Government has in its hands the reins of control. Moreover, it is expected that the National Defense Program will absorb a sizeable portion of the dispossessed tobacco farmers. In the meantime, it is hoped that resettlement projects and balanced farm programs, directed along lines of self-sufficient farming, will prepare for a day when a large agricultural class need not be at the mercy of a single money-crop. When present world hostilities have ceased - as they must in time - the old bright leaf market may be partially regained. Yet it were a costly bargain if it be done at the expense of human welfare.

Behold, at last, the allegorical picture becomes animated. The leaf has been too long in the sun. There is a shiver throughout its structure. A tiny flaw now appears - followed abruptly by a widening fissure, laterally, across the broad blade. Sun-rays penetrate the opening, and fall upon the pale human figures below. These, unaccustomed to direct sunlight, cover their eyes and cry out in imagined anguish. While the more stout-hearted of their fellows busy themselves with the task of securing the several parts of the leaf - with thread.

CHAPTER XVII

THE IMPORTANCE OF THE BRITISH MARKET FOR OUR FLUE-CURED LEAF 1/

Flue-cured tobacco in the United States is currently produced on about 200,000 farms by more than 300,000 farm families in concentrated area of six southeastern States. In response to constantly increasing domestic and foreign demand, production rose from an annual average of 198 million pounds during the four years 1909-12 to an annual average of 786 million pounds in the four years 1935-38. Gross farm income from this tobacco averaged $168,000,000 during the five years 1934-38.

In addition to being the chief cash income for many producers, flue-cured tobacco has become so closely related to the economy of the producing area, that thousands of individuals living in these communities are dependent upon maintenance of this farm income for a livelihood and a reasonable standard of living. Large investments have been made in land and equipment for tobacco production and marketing, and any permanent reduction of production below the levels of recent years would involve tremendous losses of capital expenditures as well as annual income to many individuals and families.

American flue-cured leaf has always been heavily dependent upon a foreign market. Prior to the World War of 1914-18, it was primarily an export type, and with the increase in cigarette consumption during and following the war in practically all countries throughout the world, the demand for this type of tobacco was augmented both at home and abroad.

At the close of the war in 1918, exports of tobacco rose considerably to replace depleted stocks resulting from increased consumption and insufficient shipments during the preceding four years. Following a decline in volume in the early 1920's, the trend of flue-cured exports turned upward, reaching a peak of 525 million pounds (farm weight) in 1930. During this period exports to the United Kingdom increased to more than 200 million pounds annually and exports to China rose to a record of 173 million pounds in 1930. In 1931 and 1932 exports broke sharply with a much smaller quantity going to the Orient.

Beginning in 1933, exports to the United Kingdom again picked up and during the five marketing years 1934-38 averaged 240 million pounds, farm weight, or nearly two-thirds of the exports of flue-cured tobacco. Thus, the United Kingdom furnished an outlet for approximately one-third of the total production during this period. This outlet also had taken the better grades, selling for the highest prices, thereby returning growers nearly fifty percent of their total income.

In the period prior to 1920, the United Kingdom obtained about ninety percent of its tobacco leaf from the United States. Very little tobacco was imported from countries within the Empire, and the bulk of the tobacco other than American leaf was imported from countries in the eastern Mediterranean area and used in the production of Turkish style cigarettes. Beginning in

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1/ This information was taken from a report issued by the Agricultural Adjustment Administration.

later 1919, the United Kingdom instituted its policy of Empire preference, a policy permitting imports from Empire countries at a smaller rate of tariff than from other countries. The absolute amount of this differential in favor of the Empire countries has averaged about two shillings (equivalent to 40-50 cents) per pound for tobacco. Under this policy, production of tobacco in the Dominions has been greatly stimulated; and consumption of this leaf in the United Kingdom has increased from less than five million pounds in 1920 to over fifty million pounds (processing weight) in 1938, with flue-cured accounting for about two-thirds of this consumption in recent years.

The character of the tobacco leaf imports into England has changed considerably since 1919 because of marked changes in the British taste for various tobacco products. Consumers have shifted away from pipe smoking to cigarettes, and this has meant a change from the use of dark tobacco to the light flue-cured tobaccos. Fortunately for this country, the Empire-producing areas have not been able to produce a leaf comparable to our flue-cured leaf for British cigarette tastes, but some of the British Empire countries have developed usable substitutes for our dark tobaccos. This development, together with the tariff preference for Empire tobaccos, and more important, the change in taste from dark tobaccos to light tobaccos, have almost completely displaced our once prosperous market of from 60 to 70 million pounds of dark tobacco a year in the United Kingdom. On the other hand, the increased usage of cigarettes comprised almost completely of American flue-cured leaf has increased our total market of leaf tobacco in the United Kingdom.

Flue-cured tobaccos imported from the Empire into Great Britain have been successful in partially displacing American leaf from pipe smoking mixtures. There is also the possibility of substituting in cigarettes flue-cured tobaccos from Canada, and India, especially, because of all the sources of flue-cured leaf throughout the Empire, the Canadian flue-cured crop most nearly approaches the American crop in flavor and aroma and the Indian crop nearly approaches the American crop in color, which with a neutral aroma makes Indianleaf an excellent cigarette "filler", when blended with our flue-cured tobacco.

As of January, 1939, the British market for our tobacco could have been summarized as follows: (1) The chances for a revival of our exports of dark tobacco were practically nil, and (2) the American flue-cured leaf was holding its own in the British manufacture of cigarettes. This was the situation until April, 1939, when for the first time in approximately nine years the tariff on leaf tobacco was increased by two shillings per pound. Much concern over this increase was evidenced in the Department of Agriculture, primarily because the price structure of the numerous cigarette brands in Great Britain was almost completely upset. It was felt naturally that this increase in the tariff would be a further stimulus to the utilization of Empire flue-cured leaf. Too little time, however, elapsed between April and September for the effect of this increase in tariff upon our flue-cured market in the United Kingdom to take place. Since the outbreak of the war in September, 1939, the British Government has initiated a series of regulations and agreements which have dwarfed the problem of the ability of American flue-cured leaf to out-compete Empire leaf, with its tariff preference, in British cigarette manufacture.

In July, 1939, stocks of tobacco in the United Kingdom were at the record level of 543 million pounds (import weight), consisting of 395 million pounds of American leaf, almost entirely flue-cured. The attitude of the British Government since the outbreak of the war has been to conserve foreign exchange for materials most essentially needed in the war, hoping that the non-perishable stocks of tobacco on hand would last until the war was over. Consequently, in early September, exchange certificates were denied importers of tobacco, but this restriction occurred after the British had already purchased about 100 million pounds of the 1939 flue-cured crop. Export and import permits for tobacco were required at the same time, and early in January, 1940, it was announced that no permits would be granted for the importation of tobacco from non-sterling countries except for tobacco which had been purchased prior to September 9, 1939. Beginning in September, 1940, manufacturers have agreed to reduce by ten percent their usings of tobacco, a further step to conserve stocks.

It is estimated that as of January, 1939, the level of annual usage of American flue-cured leaf in the United Kingdom was 200 million pounds (unstemmed processing weight). Of this, approximately 180 million was for home consumption and 20 million for re-export in the form of tobacco products to other countries. Since the war has begun withdrawals of tobacco for home consumption have increased slightly, but it is believed that the re-export trade has shrunk considerably. For all practical purposes, the drain upon the stocks of American flue-cured leaf on hand at the beginning of the war, plus the 95 million pounds exported to Great Britain during the crop year 1939-1940, will amount to approximately 180 million pounds for the period July-June, 1939-40. This is in line with an estimate of stocks of American leaf in the United Kingdom on July 1, 1940, of 310 million pounds. During the period July-June 1940-41, usings of our flue-cured leaf will probably amount to 165-170 million pounds, and the continuance of this rate of consumption will exhaust present stocks of American flue-cured by July, 1942.

It is hard to judge just how the various war-time policies with respect to tobacco have affected Empire flue-cured leaf. Large supplies of this leaf are on hand in England (stocks of Empire leaf, July, 1939 and 1940, were 144 and 105 million pounds, respectively). Canada, in spite of a 1940 crop considerably smaller than the preceding two crops has a larger export surplus, but even this leaf is having difficulty in finding its way to Great Britain because of exchange restrictions. Empire flue-cured leaf brought slightly higher prices in those countries whose markets opened subsequent to the outbreak of the war. Another factor in the situation is the tobacco tariff which has been increased several times, as a war-time measure, by amounts totaling eight shillings per pound since last September, making the full duty approximately equivalent to a tax of 20¢ per package of twenty full-sized cigarettes. But the preference for Empire leaf still remains at the same amount which has prevailed for the last twelve or thirteen years and which was bound against increase by the trade agreement with the United Kingdom.

Early last January, the British government announced a loan of twenty million pounds of sterling to Turkey to be amortized in a period of twenty years with the annual payment to be used by the British government for the

purchase of Turkish tobacco. This would amount to takings of Turkish tobacco of about twenty million pounds per year, which is about eight percent of the normal total tobacco usings in the United Kingdom both for home consumption and for the manufacture of products for export. The reasons advanced by the British government for this arrangement were the need for conserving foreign exchange and the political necessity of compensating its ally, Turkey, for the loss of its tobacco market with Germany. In the late summer of 1940, it was announced that an informal arrangement, though legally binding, had been established by the British Board of Trade with the tobacco industry whereby the latter would increase its using of Turkish leaf from the normal 1 to 2 million pounds a year in straight Turkish cigarettes to a new level obtained by making all of its present tobacco mixtures contain four percent Turkish through 1941 and eight percent Turkish after 1941.

TOBACCO SITUATION 1914 AND TODAY*

Contrary to popular opinion the world consumption of flue-cured tobacco did not increase materially during the last world war. It was not until 1918 that a significant growth of consumption took place. In 1914, at the outbreak of the War, flue-cured tobacco prices dropped considerably below 1913 prices, and it was not until 1916--the third year of the War--that prices moved upward. Production in 1939 was more than 200 million pounds in excess of world consumption and the present total supply in this country is the largest on record.

Table 2. Tobacco, Flue-cured: Acreage, Yield, Price, Value, Production Stocks, Supply, and Disappearance, 1909 - 1939

Year	Acreage Harvested	Yield per Acre	Price per Pound	Farm Value	Production	Stocks July 1	Supply July 1	Disappearance
	1,000 Acres	Lbs.	Cents	Million Dollars	Million Pounds	Million Pounds	Million Pounds	Million Pounds
1909	341.9	651	9.2	20.5	222.5			
1910	320.0	646	10.3	21.2	206.8			
1911	239.0	737	11.3	19.9	176.2			
1912	310.0	605	15.6	20.2	187.6			
1913	405.0	698	18.3	51.6	282.8	241.2 1/	524.0	259.6
1914	425.0	648	11.3	31.1	275.4	264.4 1/	539.8	231.2
1915	495.0	630	10.5	32.9	312.0	308.6 1/	620.6	298.2
1916	470.0	560	19.0	50.1	263.3	322.4 1/	585.7	292.1
1917	560.0	641	30.5	109.8	358.8	293.6	652.4	309.7
1918	686.0	710	34.3	166.8	487.1	342.7	829.8	450.2
1919	811.5	588	44.4	211.8	476.9	379.6	856.5	504.0
1920	908.9	678	21.5	132.5	616.0	352.5	968.5	410.7
1921	611.5	587	21.9	78.7	358.8	557.8	9;6.6	403.3
1922	659.5	630	27.2	112.8	415.4	513.3	928.7	421.0
1923	804.8	722	20.8	120.7	580.7	507.7	1,088.4	542.8
1924	754.5	580	21.6	94.5	437.3	545.6	982.9	456.5
1925	835.1	689	20.0	115.0	575.1	526.4	1,101.5	577.8
1926	800.7	699	24.9	139.7	560.1	523.7	1,083.8	544.9
1927	958.3	750	20.5	147.3	718.8	538.9	1,257.7	599.8
1928	1119.9	660	17.3	128.1	739.1	657.9	1,397.0	708.2
1929	1085.7	691	18.0	134.9	750.0	688.8	1,438.8	735.4
1930	1144.2	756	12.0	103.4	865.2	703.4	1,568.6	774.1
1931	979.5	684	8.4	56.4	669.5	794.5	1,464.0	597.0
1932	617.5	605	11.6	43.4	373.7	867.0	1,240.7	564.9
1933	920.6	797	15.3	112.1	733.4	675.8	1,409.2	646.2
1934	684.2	814	27.3	151.7	556.8	763.0	1,319.8	567.2
1935	874.0	928	20.0	162.2	811.2	752.6	1,563.8	692.5
1936	864.5	790	22.2	151.6	682.9	871.3	1,554.2	671.0
1937	989.5	875	23.0	199.2	866.3	883.2	1.749.5	795.0
1938	912.1	861	22.2	174.4	785.7	954.5	1.740.2	794.0
1939					1,014.7 1/	946.2	1,960.9	

1/ Estimate.

*Information taken from AAA report.

IMPORTANCE OF EXPORTS

Exports of United States flue-cured tobacco during the 1937 and 1938 crop years averaged 426 million pounds and were the fourth highest on record. Exports to Great Britain, our best foreign customer amounted to an average of 275 million pounds, or 64 percent of the total exports, during 1937 and 1938. The withdrawal of British buyers from the market on September 8, 1939, created a serious problem for flue-cured growers.

Table 3. Flue-Cured (11-14) Tobacco: Estimated Farm Sales Weight of Exports to Principal Countries 1926 to Date

Year Beginning July 1	Exported as Leaf Tobacco To								
	United Kingdom	China	Japan	Australia	Canada	Germany	Netherlands	All other Countries	Total
	Mill. Lbs.	Mill. Lbs.	Mill. Lbs.	Mill. Lbs.	Mill. Lbs.	Mill. Lbs.	Mill. Lbs.	Mill. Lbs.	Mill. Lbs.
1926	165.3	84.2	9.8	23.8	15.1	13.0	8.0	29.2	348.4
1927	191.0	78.2	13.4	24.9	17.3	15.5	9.7	41.9	391.9
1928	206.8	150.7	16.9	21.1	17.3	16.0	10.9	49.2	488.9
1929	223.8	149.4	12.0	22.4	15.7	10.2	8.4	69.2	511.1
1930	223.5	173.3	14.1	26.7	12.9	15.1	8.8	50.5	524.9
1931	155.2	91.5	5.3	12.7	12.3	9.8	11.2	45.4	343.4
1932	152.9	90.0	5.8	10.0	8.6	5.2	5.6	41.0	319.1
1933	198.6	99.3	9.3	12.6	9.3	9.8	13.5	36.9	389.3
1934	182.1	30.2	11.3	17.5	9.2	1.6	4.2	36.4	292.5
1935	264.8	27.4	7.8	21.1	4.4	7.8	8.3	35.8	377.4
1936	202.4	46.3	11.8	22.3	4.4	3.4	10.5	56.5	357.6
1937	279.8	41.7	2.3	21.0	4.3	5.6	9.3	62.1	426.0
1938	269.9	59.7	---	24.4	3.3	6.4	7.2	55.8	426.7
	% of Total	% of Total	% of Total	% of Total	% of Total	% of Total	% of Total	% of Total	% of Total
1926	47.4	24.2	2.8	6.8	4.3	3.7	2.4	8.4	
1927	48.7	20.0	3.4	6.4	4.4	3.9	2.5	10.7	
1928	42.3	30.8	3.5	4.3	3.5	3.3	2.2	10.1	
1929	43.8	29.2	2.3	4.4	3.1	2.0	1.7	13.5	
1930	42.6	33.0	2.6	5.1	2.5	2.9	1.7	9.6	
1931	45.2	26.6	1.5	3.7	3.6	2.9	3.3	13.2	
1932	47.9	28.2	1.8	3.1	2.7	1.6	1.8	12.9	
1933	51.0	25.5	2.4	3.2	2.4	2.5	3.5	9.5	
1934	62.3	10.3	3.9	6.0	3.1	.6	1.4	12.4	
1935	70.2	7.3	2.1	5.6	1.2	2.0	2.2	9.4	
1936	56.6	12.9	3.3	6.2	1.2	1.0	3.0	15.8	
1937	65.7	9.8	.5	4.9	1.0	1.3	2.2	14.6	
1938	63.3	14.0	---	5.7	.8	1.5	1.7	13.0	

DOMASTIC CONSUMPTION

In 1919 only 82 million pounds of the U. S. flue-cured tobacco crop was used domestically in cigarettes, while in 1938, 285 million pounds were used in cigarettes. Although the total consumption of flue-cured tobacco in this country is still increasing, the rate of increase has slowed down considerably since 1936. The increase in 1936 was 8.7 percent over 1935, while in 1938 the increase over 1937 was only 1.5 percent.

Tobacco, Flue-cured: Estimated Quantities Consumed in Cigarettes, Smoking Tobacco, and Chewing Tobacco, 1919 - 1938

Marketing Yr. Beginning July 1	Cigarettes		Smoking Tobacco		Chewing Tobacco		Total	Increase or Decrease from Previous Year
	Million Pounds	Percent of Total	Million Pounds	Percent of Total	Million Pounds	Percent of Total	Million Pounds	Percent
1919	82.3	54.3	36.2	23.9	33.1	21.8	151.6	
1920	73.6	56.0	33.6	25.5	24.3	18.5	131.5	- 13.3
1921	81.8	54.6	44.4	29.6	23.6	15.8	149.8	+ 13.9
1922	102.1	60.9	39.9	23.8	25.6	15.3	167.6	+ 11.9
1923	113.9	65.3	36.5	20.9	24.1	13.8	174.5	+ 4.1
1924	125.5	67.3	38.2	20.5	22.7	12.2	186.4	+ 6.8
1925	141.7	70.2	37.2	18.4	22.9	11.4	201.8	+ 8.3
1926	153.8	73.7	33.5	16.0	21.5	10.3	208.8	+ 3.5
1927	165.9	76.0	31.7	14.5	20.7	9.5	218.3	+ 4.5
1928	189.2	79.3	29.0	12.2	20.2	8.5	238.4	+ 9.2
1929	201.7	80.7	29.6	11.8	18.8	7.5	250.1	+ 4.9
1930	201.2	80.2	32.9	13.1	16.7	6.7	250.8	+ 0.3
1931	176.2	73.3	50.2	20.9	14.0	5.8	240.4	- 4.1
1932	182.3	72.3	57.2	22.7	12.7	5.0	252.2	+ 4.9
1933	196.4	72.5	61.5	22.7	13.0	4.8	270.9	+ 7.4
1934	217.4	75.2	59.2	20.5	12.5	4.3	289.1	+ 6.7
1935	239.6	77.2	58.7	18.9	12.2	3.9	310.5	+ 7.4
1936	267.8	79.3	57.5	17.0	12.3	3.7	337.6	+ 8.7
1937	278.7	80.3	57.0	16.4	11.5	3.3	347.2	+ 2.8
1938	284.7	80.8	56.8	16.1	11.0	3.1	352.5	+ 1.5

FOREIGN PRODUCTION

From 1924 to 1929, production of flue-cured tobacco in foreign countries showed no significant change. Beginning in 1930, as trade conditions became increasingly worse, production in foreign countries increased materially. High tariff rates prevented foreign countries from selling goods in the United States to obtain money with which to buy our products and nationalistic policies were adopted which encouraged production in other countries. In some countries tobacco was placed under control of a government monopoly. In other countries extremely high import duties were placed on United States tobacco.

Table 5--Tobacco, Flue-cured: Estimated Production in Specified Foreign Countries, 1924-1938.

In Millions of Pounds

Year	China	Manchuria	Japan	Chosen	Formosa	India	Nyasaland	Southern Rhodesia	Australia	Canada	Dutch East Indies	Total 11 Countries
1924	70.0		5.6	4.9			4.9	2.0	1.0	5.5		93.9
1925	52.0		8.2	4.2			4.5	5.3	2.3	6.3		82.8
1926	23.3		9.8	4.3			9.1	18.5	1.2	4.3		70.5
1927	18.0		13.7	5.8			6.0	24.3	1.8	6.2		75.8
1928	33.0		14.0	6.9		.5	2.9	6.1	1.8	8.7		73.9
1929	38.2		15.1	7.2	.5	1.4	3.0	4.9	1.7	9.0	.1	81.1
1930	83.5		17.7	4.5	.5	1.3	2.6	7.2	1.6	12.4	.1	131.4
1931	111.0	2.0	21.8	6.6	.4	2.7	3.5	12.7	10.2	24.5	.2	195.6
1932	104.0	2.1	23.7	7.0	.5	8.2	2.3	12.9	9.7	27.6	.2	198.1
1933	149.0	2.5	40.3	5.8	.6	11.0	2.7	25.2	4.3	26.9	.3	268.6
1934	140.0	3.1	44.6	7.1	1.1	13.5	1.5	19.5	3.1	22.1	.8	256.4
1935	163.0	5.0	51.3	7.1	1.3	16.4	2.1	20.7	5.6	35.2	1.3	309.0
1936	180.0	4.9	48.9	7.6	1.9	19.5	2.3	20.3	5.2	24.6	2.6	317.8
1937	210.0	7.7	62.2	9.1	2.9	40.0	2.1	25.3	6.5	55.4	4.3	425.5
1938 1/	81.5	12.5	68.0	12.4	3.5	45.0	2.5	26.2	5.0	75.4	5.7	337.7

1/ Preliminary