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ALABAMA

Agricultural Experiment Station

OF THE

AGRICULTURAL AND MECHANICAL COLLEGE,

AUBURN.

TOBACCO.

ALEX. J. BONDURANT.

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PART I.

TOBACCO EXPERIMENTS.

Experiments in tobacco were continued the past year with Plug and Cigar varieties. These experiments were undertaken to ascertain the best method of raising tobacco plants in Alabama, to find out the best kinds of tobacco for this climate and soil, the most suitable fertilizers for the tobacco crop, and for investigating some of the different methods of curing tobacco.

Methods of raising the plants.—The first bed for raising the plants was made at the Horticultural Grounds Jan. 31st. A frame was made of boards, 8x16 feet, such as is used for hot-beds, and into this frame rich woods mould was placed, well fertilized with equal portions of cotton seed meal and acid phosphate. The seeds were sown in drills a few inches apart, and the different varieties labelled. The bed was then covered with cheese cloth sewn together to make a close covering to keep in as much heat as possible and fastened to the planks with tacks. In three weeks from time of seeding, the plants came up. In this bed the plants made a good growth and would have been large enough for setting-out early in April, but for a freezing spell which occurred March 25th, destroying corn that was up and gardens generally. This unusually cold weather so late in the Spring in this climate, continued for three days, and owing to this bed being in a cold, exposed position, most of the plants were killed. In this connection, I found that the thin cheese cloth used for covering, in this instance, was not sufficient to protect the young plants from freezing. A thicker and better covering for the beds upon which oil is used in its make, and which will last more than a year, is prepared by T. W. Woods & Son, Richmond, Va.

The Woods bed.—This bed was prepared in a moist bottom in the woods, well protected by being surrounded with pines, and was seeded about a week later than the first bed. The bed was well burnt, the heavy coals taken off and the ground gotten in a finely pulverized condition with hoes and rakes. It was fertilized after the same method as before mentioned, seed sown and labelled, and covered in the same way as the first bed.

Boards about one foot broad were placed around this bed for the laths to rest on to which the canvass was tacked. In addition to this purpose, when a plant bed is inclosed with boards in the manner described, there is not much danger of its being attacked by the hopping flea beetle.

The plants came up well in this bed and were not so large as those in the first bed, when the dreadful March freeze came. Comparatively few of these plants were killed, which is accounted for, by the bed being so well protected from the cold winds by the dense pine forest.

After recovering from the effects of the cold, the plants grew off rapidly and many were ready for setting out in the month of April. These plants were not attacked at all by the flea beetle, which fact is explained by the beds being surrounded with boards and covered with cheese cloth.

From experiments made in raising plants in open beds, we find that they are liable to be destroyed by the flea beetle and other insects. Hence, we can reasonably infer that the best results will be obtained by having the plant bed in a well sheltered moist place in the woods, by surrounding the bed with boards, covering it with cloth and placing a light dressing of short pine straw on the bed after burning and before putting on the cloth.

Again, it is better to use cloth of a heavier thickness than the ordinary cheese cloth. It can be safely stated, that in the experiments conducted for three years in raising tobacco plants on the station, that fertilizing the plant beds with equal parts of cotton seed meal and acid phosphate have given better results than any other method of fertilization.

Preparing for Planting.—The land used for the Variety Experiment was poor, sandy up-land. It was cultivated in tobacco the year previous and after the crop came off, the land was plowed, fertilized and seeded with rye for winter soiling. After the rye was used for feeding purposes, the stubble was plowed-under the 23d of April and this plot of ground prepared for the tobacco Variety Experiment.

The rows were laid-off with a shovel plow, and the amount of fertilizers, as is shown in the table, was applied to each plot, mixed with the soil with a shovel furrow and then bedded-on with a Dixie plow. On May 1st, afternoon, planting commenced on the Variety Experiment by hauling water, and a few rows were set out. In the afternoon of May 2d and morning of the 3d, sufficient rain fell and all the plots of this Experiment were planted.

May 14th. Gentle rain commenced at 12.30 this day and continued until night.

The next day this Experiment was replanted—that is, plants were put in all missing hills. Most of the plants used at this time were overgrown and spindling, and were taken from the burnt bed in the woods. The few plants that were not killed in the bed at the Horticultural Grounds were overgrown even before the time of planting and on that account were not used in any of the experiments.

May 23d. The missing hills in this Experiment were again re-planted. More of the Cigar varieties were missing than the plug varieties.

June 18th. Slight rain in the evening, the first rain sufficient to moisten the ground since the 23d of May.

June 19.—Another light rain and this with the rain of the 18th made a fair season for putting out plants. All the plots in this experiment were gone over and every missing hill replanted. There was no further replanting done on this Variety Experiment as a fair stand was secured. The experiment was worked mostly with plow, receiving one or two workings with the hoe. Notwithstanding the season was dry, some of the first plants set out grew rapidly, and on

June 18th a few plants of the Havana tobacco were putting out fruit buds and were topped.

July 3d.—The dry weather has continued, but the plants have made a good growth and a general topping was done on the cigar varieties. The plug varieties were not so forward in their growth and at that time, very few of these varieties required any topping.

About July 5th it commenced raining, and for several weeks there were occasional showers and heavy rains. Soon after that time, both the plug and cigar varieties in this experiment attained their growth.

HARVESTING AND CURING.

The gathering of the leaves for curing was begun August 20th, by first taking off the ground leaves of the plug varieties, placing them in baskets used for this purpose as fast as gathered and then taking them to the curing barn. The gathering continued through the 21st and the barn was filled on the morning of the 22nd.

August 24th 6 a. m.—Started fires for curing. Tobacco had yellowed fairly well in the house. Temperature outside and inside of barn 75° before starting fires.

After starting the fires, the temperature in the barn for 24 hours ranged from 80° to 86°

August	25.	—Temperature ranged	from	90°	to 95°
"	26	"	"	95	to 100
"	27	"	"	100	to 110
"	28	"	"	120	
"	29	"	"	125	to 130

and fires stopped at sun-set.

Tobacco seemed to be thoroughly cured with a fair proportion of bright yellow tobacco.

Sept. 1st.—Sprinkled floor of tobacco barn about 4 p. m. preparatory to taking it down.

Sept. 3rd, Monday.—Took tobacco out of barn and bulked it down in another building, so as to have the barn ready for another curing.

The tobacco remained in bulk until about Nov. 1st, when it was opened, assorted and put into hands. At this time samples were selected for the Montgomery Exposition.

The tobacco having been taken down out of the curing house in good, safe keeping order, that is, without the leaves being *too moist* or in *too high case*, and the *stems being thoroughly cured* by fire in the barn, the bulk after standing more than *two months* was found to be perfectly sound and with a good flavor.

Just here it may be well to note, that in this case, flue cured tobacco underwent *but little*, if *any fermentation*, when *placed in bulk*, which condition is favorable for chewing tobacco, but not suitable for cigar and smoking.

August 22nd the cigar leaf of this experiment was gathered.

The method of harvesting and curing was different from the one followed with the plug varieties. The stalk was cut off close to the ground, after first splitting it half way down from the top. The tobacco was then placed in a well ventilated house, with doors at each end and windows in the sides—for air curing. In a few weeks the leaves were air-cured. When it was taken down, which was about the same time that the plug kinds were taken down, all of the main stems were pretty well cured, though some parts of the stalks were not fully cured.

The cigar types were managed, after being taken down, the same as the plug kinds, samples of which were on exhibition at the Montgomery Exposition in Nov. 1894.

The following facts from investigations concerning the cigar varieties are of some importance.

(1) *Comstock Spanish*—Large, broad, thin leaf good cinnamon color. Size sufficient to make cigar wrappers.

(2) *Connecticut Seed Leaf*—Fine, large size, rather lighter color than No. 1, and not so large a leaf. Leaf large enough for cigar wrapper.

(3) *Havana*—Rather small for wrappers—makes good fillers and binders.

(4) *Havana Seed Leaf*—Larger than Havana. Not so

large as Nos. 1 and 2. Makes good fillers and binders and some leaves large enough for wrappers. The flavor of all these is decidedly cigar, and having been cured by the *air process* will ferment well, and after undergoing fermentation, should make cigars of fine quality.

(5) *Brazil Gold Leaf*—This variety was from seed sent by Mr. R. D. Martin, Florence, Ala. When cured, it was of a brighter color than any of the other cigar varieties. Leaf thin and silky, but not so decided a cigar flavor as the others mentioned. Yield much less. Mr. Martin has been growing this variety for several years and informed me that he had sold last year's crop for thirty cents a pound.

The yield of the plug and cigar varieties in this experiment is shown by table No. 1, which is hereto appended.

TOBACCO. TABLE NO. 1.

VARIETY EXPERIMENT.

Plot ½ Acre. 11 Plots 1-22 Acre each.

Plot No.	NAME AND QUANTITY OF FERTILIZERS PER PLOT.	NAMES OF VARIETIES.	How cured and when.	Yield per Plot Dry.	Yield per Acre Dry.
1	Cotton S. Meal 27.3-11. Acid Phos.....13.7-11. Kainit..... 9.1-11.	Comstock Spanish.....	Air Oct. 31.	39.6	871.2
2	Cotton S. Meal 27.3-11 Acid Phos.....13.7-11. Kainit..... 9.1-11	Connecticut Seed Leaf.....	"	34.1	750.2
13	Cotton S. Meal 27.3-11. Acid Phos.....13.7-11. Kainit..... 9.1-11.	Pure Havana....	"	39.1	860.2
4	Cotton S. Meal 27.3-11. Acid Phos.....13.7-11. Kainit..... 9.1-11.	Havana Seed Leaf.	"	59.3	1304.6
3	Cotton S. Meal 27.3-11. Acid Phos.....13.7-11. Kainit..... 9.1-11.	Conqueror.....	Snow Barn Sept. 3d.	32.4	712.8
6	Cotton S. Meal 27.3-11. Acid Phos.....13.7-11. Kainit..... 9.1-11.	Hyco	"	41.7	917.4
7	Cotton S. Meal 27.3-11. Acid Phos.....13.7-11. Kainit..... 9.1-11.	Long Leaf Gooch.	"	39.7	873.4
9	Cotton S. Meal 27.3-11. Acid Phos.....13.7-11. Kainit..... 9.1-11.	Yellow Oronoco..	"	34.3	754.6
14	Cotton S. Meal 27.3-11. Acid Phos.....13.7-11. Kainit..... 9.1-11.	Yellow Pryor....	"	39.2	862.4
10	Cotton S. Meal 27.3-11. Acid Phos.....13.7-11 Kainit..... 9.1-11.	White Stem Oronoco	"	35 6	783.2
16	Cotton S. Meal 27.3-11. Acid Phos.....13.7-11. Kainit..... 9.1-11.	Brazil Gold Leaf.	"	23.8	523.6

SPECIAL NITROGEN EXPERIMENT.

As the cultivation of tobacco in the State of Alabama is a new industry, it is important to find out the best method of fertilizing on this soil.

The experiment which follows was undertaken with this in view—to ascertain how the tobacco plant responds to the use of nitrogen in different forms and qualities when added to a *basal mixture* of phosphoric acid and potash. By a *basal mixture*, is meant a specific amount of fertilizer, in this case, phosphoric acid and potash being used as a basis for comparison in studying the effect of some fertilizing constituent, nitrogen being used in different forms and amounts, in the experiment to show the increased yield in the produce due to its action.

Phosphoric acid and potash are supplied in the proportions that are thought sufficient for a good yield, and nitrogen is supplied in one-third, two-thirds and full quantities. Nitrogen is used as nitric acid in nitrate of soda, as ammonia in sulphate of ammonia and as organic nitrogen in dried blood.

Twenty plots are provided for in the *field plain*—eighteen of which received the experimental manures while two plots received none.

Figure 1 shows the appearance of some of the plug varieties while growing.

NOTES ON FERTILIZER TEST, AUGUST 20.

No. 1.—No manure. Tobacco only medium in size. Ripened unevenly and seems to belong to the cigar variety.

No. 2.—About one-third larger than No. 1, and at this date (Aug. 20) about one half of the plot is ready for cutting. Seems to be the same variety as No. 1, and from general appearance would call it Havana. Inclined to ripen with a yellow color.

No. 3.—Evidently a cigar variety. The entire plot has ripened quite yellow and it is very evident that this fertilizer will cause tobacco to ripen yellow.

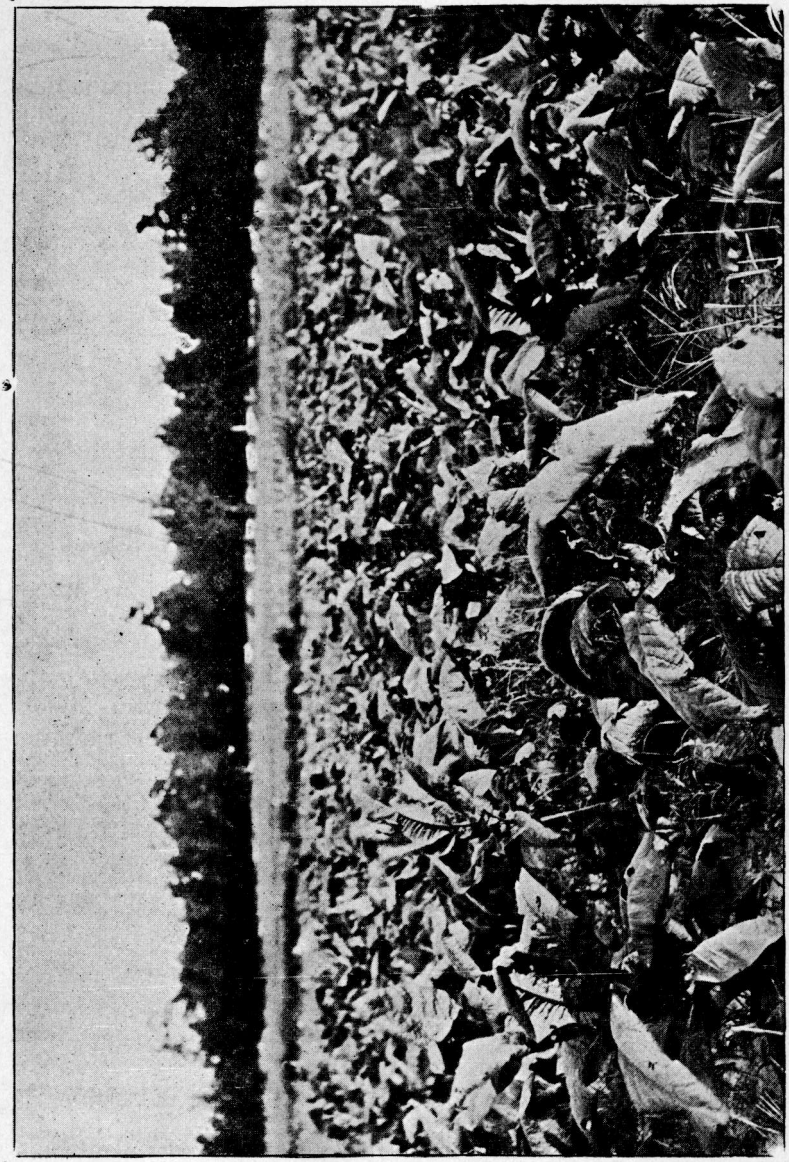


FIGURE 1

No. 4.—Cigar variety. Smaller than No. 3. Ripens quite yellow on stalk.

No. 5.—Plug variety. Greenish appearance, seems to fire badly at bottom of stalk. I am inclined to the opinion that the fertilizer used on this plot is too caustic, or it may be due to too much rain for this soil.

No. 6.—Evidently a plug variety. The fertilizer on this plot seems to have acted fairly well for this kind, good size growth, light tea green color and at this date but little ripe.

No. 7.—This plot though not yet ripe, the indications are that it will ripen yellow, and that the fertilizer used will make yellow tobacco.

No. 8.—Evidently a plug variety. At this date it is decidedly larger, and greener in appearance than any of the preceding plots. The fertilizer used is for extra large stemming which this seems to be.

No. 9.—Plug variety. Larger than No. 8; very large stemming; dark green, and from the appearance the indications are that the fertilizer, in quantity and quality used, is a complete fertilizer for large stemming tobacco.

No. 10.—This plot quite large, dark green and shows that the fertilizer used is suitable for a large dark tobacco.

No. 11.—Plug variety. Medium size, beautiful yellow color, and indicates that the fertilizer seems to be the kind for making yellow tobacco.

No. 12.—Tobacco good size; light green, but little burnt at bottom. Fertilizer seems to suit a dark tobacco.

No. 13.—Very large; ripening pale green, and the indications are that this application of fertilizer is very fine for making a large tobacco suitable for stemming.

No. 14.—Compares favorably with No. 13, and does not seem to be superior to it.

No. 15.—Medium size and compares favorably with No. 7, with the exception of not being so bright.

No 16.—Medium in size; shows yellow tint in ripening.

No. 17.—Large; green color, and shows color and size for stemming.

No. 18.—Decided stemming type. Resembles No. 17 in color, but leaf much larger than 17.

No. 19.—Quite small and indifferent, slight yellowish tint.

No. 20.—No manure. Very small and indifferent, and shows plainly that tobacco can not be raised on soil like this without fertilizers.

By reference to the following table, and by comparing these plots in groups of threes, it appears that the nitrogen in the form of nitric acid, contained in nitrate of soda, in plots 8, 9 and 10, of group 1, gave the best results. Dried blood, in the form of organic nitrogen in plots 16, 17 and 18, of group 2, gave the next best, and ammonia, in sulphate ammonia in plots 12, 13 and 14, group 3, gave the poorest results.

Group 1.	Plot No. 8.	Nitrate Soda, yield per acre	964 lbs.
	" " 9.	" " " " "	1020 "
	" " 10.	" " " " "	972 "
			2956
Group 2.	Plot No. 16.	Dried Blood, yield per acre	800 lbs.
	" " 17.	" " " " "	996 "
	" " 18.	" " " " "	1072 "
			2868
Group 3.	Plot No. 12.	Sulphate Ammonia, yield per acre	508 lbs.
	" " 13.	" " " " "	1000 "
	" " 14.	" " " " "	952 "
			2460

CONTINUATION OF NITROGEN EXPERIMEMT.

This test was made on plots contiguous to one another and as nearly alike as possible in physical conditions and fertility.

The soil upon which it was made was poor sandy upland. Every application contained the same amounts of potash and phosphoric acid, and practically the same amount of nitrogen, but in different forms, thus giving at the same time all the fertilizing constituents required and full effect to the nitrogen employed.

The plots upon which the sulphate of ammonia was used suffered more from *field-fire* or *blister* than any of the others. To sum up the results of this experiment, it appears that the unmanured plots gave the poorest returns, that nitrogen was most effective in the form of nitric acid in nitrate of soda and in the form of organic nitrogen in dried blood, and was least effective in the form of ammonia in sulphate of ammonia.

Owing to circumstances, it was impossible to have all the plots of the same variety of tobacco.

Table No. 2, attached, gives the experiment in full. Figure No. 2, which follows this table, shows the appearance of several kinds of tobacco before harvesting.

TOBACCO. TABLE NO. 2.

Special Nitrogen Experiment, to ascertain how the *plant responds* to the use of Nitrogen in different forms and quantities, when added to a *basil mixture* of Phosphoric Acid and Potash, one.half acre, plots 1–40 acre.

Pot No.	Names and Quantity of Fertilizers used per Plot.	Names of Varieties.	How Cured.	When Cured.	Yield per Plot Dry.	Yield per Acre Dry.
1	No manure.....	Brazil Gold Leaf..	Air...	Oct. 31.	.....	.....
2	Nitrate Soda ... 8 lbs.	" " " ..	" ..	"	.....	.....
3	Diss. Bone Black.16 "	" " " ..	" ..	"	.....	.....
4	Sul. Potash.....12½"	" " " ..	" ..	"	.....	.....
5	Nitrate Soda.... 8 " Diss. Bone Black.16 " Nitrate Soda.... 8 "	Yellow Pryor....	Snow Barn .	Sept. 3.	15.1	604.
6	Sul. Potash.....12½" Diss. Bone Black.16 "	" "	" ..	"	31.3	1252.
7	Sul. Potash.....12½" Diss. Bone Black.16 "	" "	" ..	"	6.6	264.
8	Sul. Potash.....12½" Nitrate Soda.... 8½" Diss. Bone Black.16 " Nitrate Soda... 16 "	Yellow Oronoco..	" ..	"	24.1	964.
9	Sul. Potash .....12½" Diss. Bone Black.16 " Nitrate Soda....24 "	" " ..	" ..	"	25.5	1020.
10	Sul. Potash.....12½"		" ..	"	24.3	972.
11	Diss. Bone Black.16 " Sul. Potash.....12½"	White Stem Oronoco. .	" ..	"	22.2	888.
12	Diss. Bone Black.16 " Sul. Potash.....12½" Sul. Ammonia.6.1–10"	" "	" ..	"	12 7	508.
13	Diss. Bone Black.16 " Sul. Potash.....12½" Sul. Ammo.12.2–10 "	" "	" ..	"	25.0	1000.
14	Diss. Bone Black.16 " Sul. Potash.....12½" Sul, Ammo.18.3–10 "	Conqueror.....	" ..	"	23.8	952.
15	Diss. Bone Black.16 " Sul. Potash..... 12½"	"	" ..	"	16.3	652.
16	Diss. Bone Black.16 " Sul. Potash.....12½" Dried Blood..16 6–10"	"	" ..	"	20.0	800.
17	Diss. Bone Black.16 " Sul. Potash.....12½" Dried Blood..23.2–10"	Hyco.....	" ..	"	24.9	996.
18	Diss. Bone Black.16 " Sul. Potash.....12½" Dried Blood..34.9–10"	"	" ..	"	26.8	1072.
19	Diss. Bone Black.16 " Sul. Potash.....12½"	"	" ..	"	10.9	436.
20	No manure.....	"	" ..	"	.....	.....

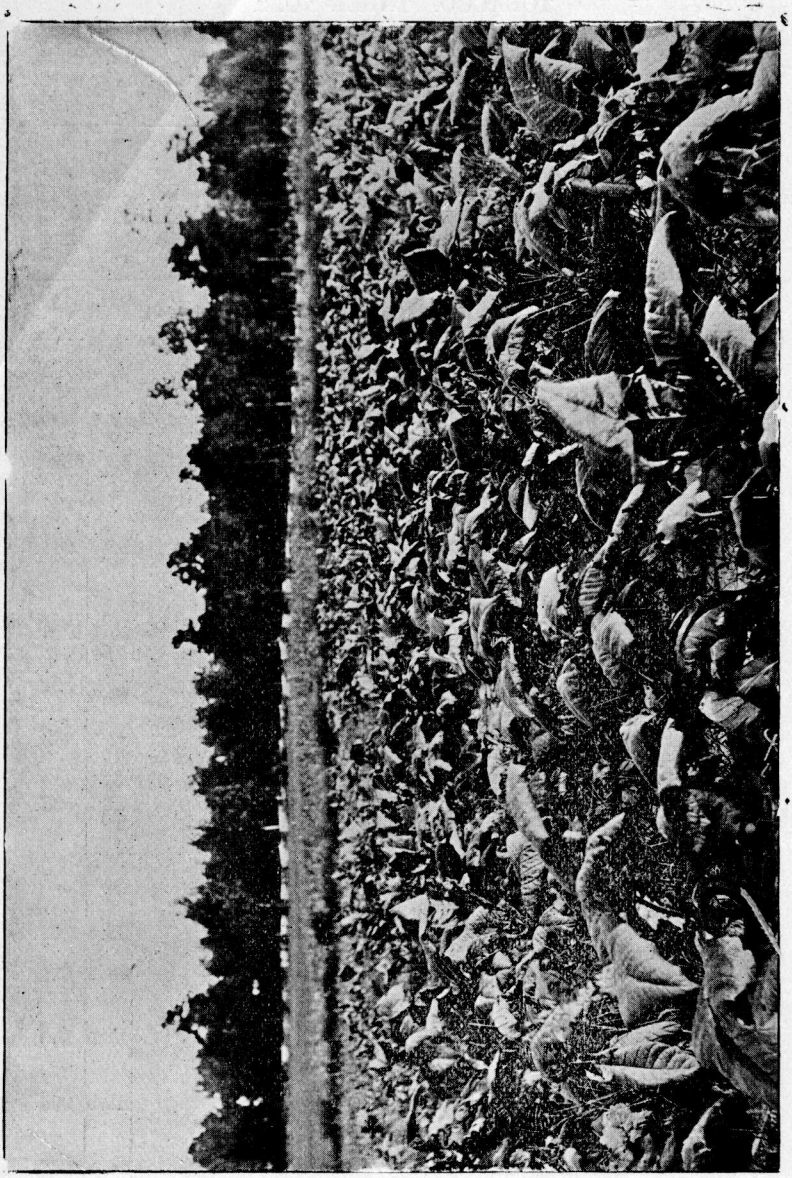


FIGURE 2.

Tobacco—Table No. 3.

EXPERIMENTS WITH FERTILIZERS WITH THREE POPULAR CIGAR VARIETIES.

This was the last experiment, planted May 14th. Fertilized with 225 lbs. sulphate of potash, 150 lbs. sulphate ammonia and 150 lbs. acid phosphate, for ½ acre. One plot was unmanured in addition to the ½ acre.

The land upon which this experiment was made was very poor, was planted in peas the year previous which yielded a very poor crop on account of the extreme poverty of the soil.

The yield of these three cigar types can be seen from table No. 3 which follows.

Plot No.	Size of Plot.	Name of Varieties.	Pounds yield per Acre.
1	1-6 Acre. ...	Connecticut Seed Leaf.....	519.4
2	" "	Havana Seed Leaf.....	827.8
3	" "	Pure Havana.....	387.5
4	.....	Unmanured.....	made nothing.

Figure 3 shows the appearance of the plots while growing and before cutting. Also shows the unmanured plot on the left side of picture, which was a total failure on account of the extreme poorness of the soil.

MANUFACTURING INTO PLUG AND CIGARS.

The tobacco raised on the station in 1893, was manufactured into chewing tobacco and cigars by a firm in Richmond, Va.

The cost of manufacturing for chewing was twenty-six cents a pound. After the flavoring necessary for its manufacture into plug had been put on, the tobacco weighed as much as it did before it was stemmed for manufacture. In

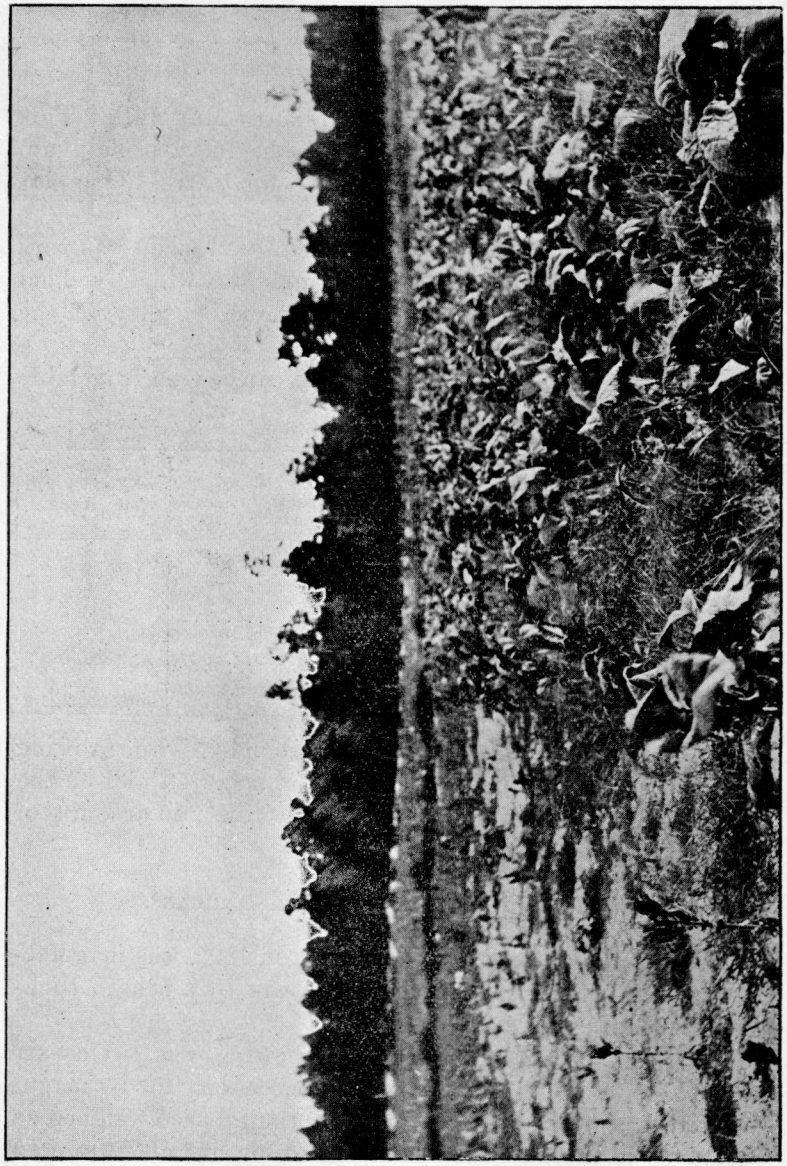


FIGURE 3.

other words, in this case, 100 pounds of unmanufactured tobacco made 100 pounds ready for chewing. The leaf sent from the station was of good quality, and the manufactured article was pronounced excellent by competent judges. In order to test the merits of this tobacco it was placed in the hands of merchants for sale in different localities, and the prices realized at retail were 40, 50 and 55 cents per pound.

Several boxes were sold by a merchant in Montgomery, Ala., at 30 cents a pound wholesale. These are better prices than are obtained for much of the Virginia and North Carolina plug tobacco sold in this State.

The manufacturer of this tobacco used the best quality and a high priced flavoring material, which made the cost more than the common grades. A fair chewing tobacco, with less costly seasoning, can be manufactured for about 14 or 15 cents a pound.

Notwithstanding the cost of manufacture in this particular case, it left a reasonable profit for the tobacco.

This tobacco was on exhibition at the late Montgomery Exposition, and much of it was distributed to the lovers of the weed and to those who are interested in this new industry in Alabama.

MAKING CIGARS.

The tobacco sent to be made into cigars had to go through several months fermentation before being manufactured. A few boxes were received in November and some sent to the Montgomery Exposition and distributed. None have been sold as the supply made up was limited. Judges of cigars value them at $25 to $30 per thousand. It requires about twenty pounds of tobacco to make a thousand cigars such as we had made. The cost of making was $20 per thousand.

MARKETING THE CROP.

Much trouble is found in marketing the tobacco raised here on account of the high rates of freight to the Eastern and Western markets, and to remedy this tobacco *should be manufactured at home.*

Since this industry was started on the station, parties who have gotten instructions from us as to the growth and management of the tobacco plant, are growing their own tobacco and making cigars.

The cost of an out-fit for manufacturing plug is small, and if enterprising farmers would grow tobacco in sufficient quantities and co-operate in establishing manufacturing plants in different parts of the State the undertaking should prove profitable. The culture of tobacco will add materially to the prosperity of the farmers when they learn to give it proper and careful attention.

This industry has become quite a prominent feature in South Carolina agriculture and has proven one of the best paying crops introduced. It has been demonstrated beyond question to be a success in certain parts of the State. In the Pee Dee section it has succeeded well, but it has had its most satisfactory development in Darlington county. Ten years ago tobacco was not grown for market in South Carolina. Last year 1,000,000 pounds were raised and marketed in Darlington county. The acreage devoted to the cultivation of tobacco was not 5 per cent. of what was devoted to cotton, yet the value of the tobacco product was 16 per cent. of all the cotton raised in the county. The money value of the tobacco crop of Darlington county was $120,000.

This station has sent out this winter, on application of farmers, a large quantity of tobacco seed raised here. There is yet a limited quantity on hand which will be furnished to those asking for them.

PART II.

Inasmuch as the interest in tobacco culture has increased in the State during the last two years, the demand for the Tobacco Bulletins has exceeded the number published by the station; and owing to this fact, it becomes necessary to reproduce in this issue some inportant information contained in previous Bulletins, especially in the illustrated number, 44, issued May, 1893.

The scientific facts pertaining to agriculture, so far as they have been discovered, are scattered through many books and agricultural publications; few of these publications are accessible to the ordinary farmer.

Some service may be done to the farmers generally, and especially in the Cotton States, by stating some important facts that are accurately and certainly known, and the experience of intelligent farmers and scientific men on the subject of tobacco culture and by presenting these in compact form.

Tobacco growing is one of the most profitable branches of tropical and semi-tropical agriculture; the subject has been much neglected by writers of agricultural literature. The importance of the subject to the farmer may be estimated when it is considered that next to the cereals used as staple articles of food, there is probably no plant so widely and generally grown as tobacco, and certainly none that is used by a greater number of the human race. It is proposed in this Bulletin to notice some of the leading varieties, some instructions for its successful cultivation and management with a view to encourage the cultivation of a plant that can be generally grown in this State, the climate and soil of which, it is believed, suit it admirably in sufficient quantity, not alone to satisfy all local demands, but to open up a large and profitable export trade.

The investigation of this subject was commenced in 1892, and methods of cultivation and management of this crop were given in Bulletins No. 37, March 1892, No. 44, May 1893, and No. 54, February 1894.

I.

RAISING THE PLANTS.

It has been demonstrated from experiments made in the raising of tobacco plants that the young plants were easily affected by cold and quickly killed by freezing weather, in this climate, in fact, they seemed to be affected sooner in this

respect than in many localities in the old tobacco raising States. To avoid this difficulty, it is advisable to raise the plants under covered beds, in preference to open air beds. Another important discovery has been made in raising plants on the station, viz: That the flea beetle, commonly called tobacco fly in the old tobacco States, seems to be abundant in this section, attacking the plants soon after they come up, and in uncovered beds destroying them, unless insecticides be promptly applied.

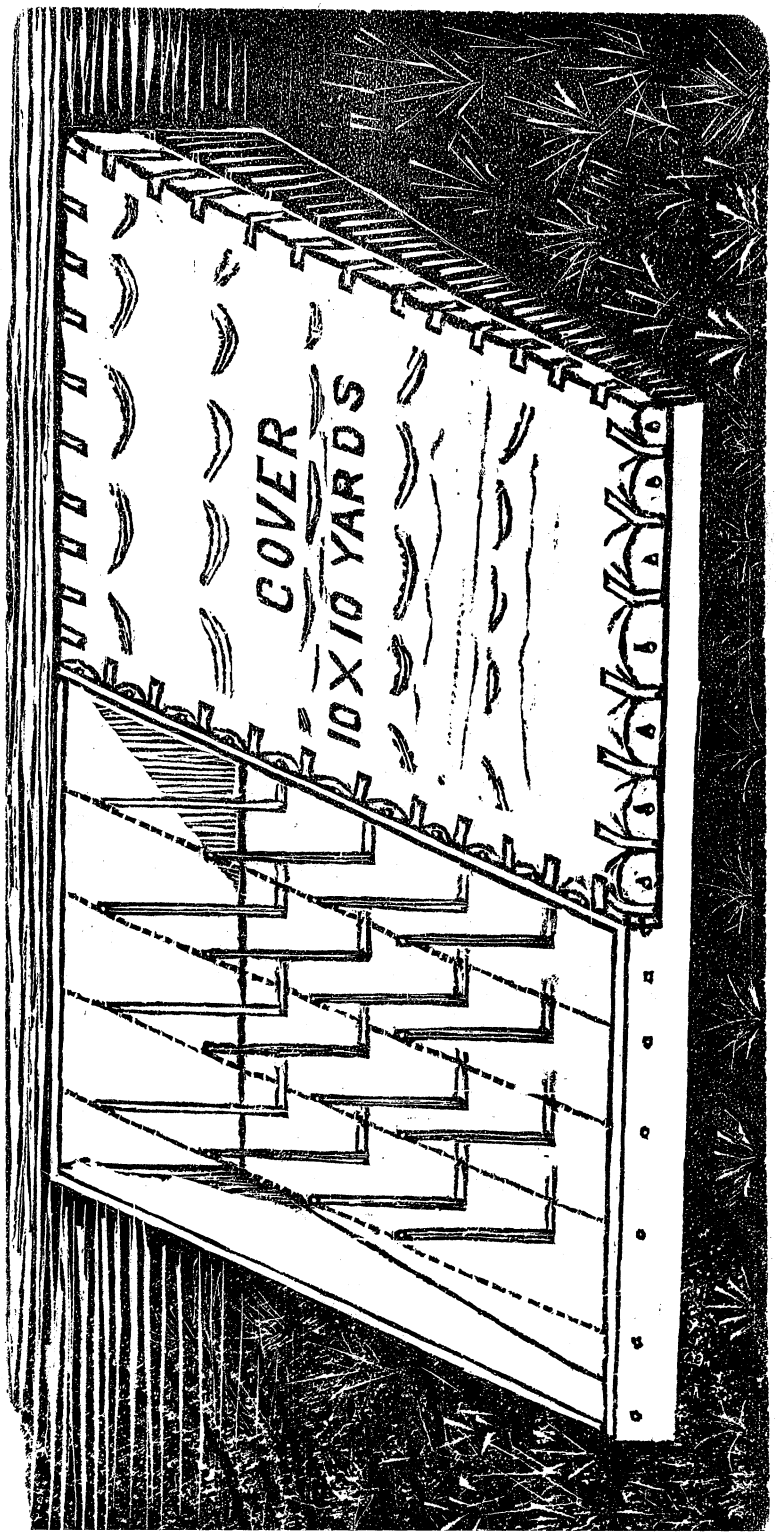
As a remedy for the flea beetle and other insects I would advise spraying the bed with the following solution: One ounce of Paris Green well mixed with fifteen or twenty gallons weak soap suds. This same application can also be used after the plants reach the surface.

Pyrethum, commonly called insect powder, can be used in place of Paris Green, either dry or mixed with water, but it is not considered so effective as Paris Green, and besides it is costlier and more difficult to procure unadulterated.

It has been ascertained from these experiments that the plants raised under canvass made a more rapid growth and presented a healthier appearance and were ready for transplanting much earlier than those from open air beds.

The first operation necessary in starting tobacco growing is the making of a seed-bed for raising the plants. A warm sheltered position should be selected for this. It is a common plan to burn a pile of brush-wood, on the land selected for raising the plants, to supply potash and at the same time for destroying the seeds of weeds or the eggs of insects.

A more recent plan of raising the plants is under a covering of cheese cloth in a hot bed. Plate No. 4 is an illustration of the modern method of covering the plants during their growth, both in the open air and hot beds. The area of the seed-bed will of course depend upon the extent of the proposed cultivation and as usually about one square inch in space is allowed to each young plant in the seed-bed, it will require a seed-bed of thirty-six square feet, say nine by four feet, to supply plants for an acre planted at equal distances of three feet apart.


COVER
10 X 10 YARDS

An ounce contains enough seed to plant from six to seven acres, but as the seed do not possess a high percentage of vitality, it is usual to sow at the rate of half an ounce for an acre. The bed ought to be covered with a covering of cheese cloth, or fine brush or short-leaf pine straw. A bettter cloth, however, than cheese-cloth for this purpose, is prepared by T. W. Woods & Son, Richmond, Va., which will last more than one season. This not only protects the plants from the cold, sudden freezes, which are common in the early spring in this latitude about the time germination commences, but checks too rapid evaporation from the earth, keeping the surface moist. When the young plants first appear above the surface, they are very tender and require frequent watering of weak liquid manure and top dressing with fertilizers.

All weeds must be carefully removed, and the flea beetles, which often destroy the young plants in a few days, must be watched for and the insect remedies before mentioned applied. In from five to six weeks from the time the plants appear on the surface, they will be ready for transplanting.

The bed for producing the plants should be well fertilized. A complete fertilizer has given good results. We have also raised excellent plants by fertilizing with equal portions of cotton seed meal and acid phosphate. When these too, however cannot be supplied, stable or hog manure, free from seeds, well chopped into the soil at the time of preparing bed for planting, will answer a good purpose.

II.

CLIMATIC CONDITIONS.

Of the many conditions which affect the quality of tobacco, the most important is climate; other conditions may be, in a measure, modified, but very little can be done with regard to climate. The most rational mode of overcoming this difficulty would be in the selection of seed of the varieties which have been grown with success under similar climatic conditions as prevail in the district proposed to be cultivated.

In this State, with its range of climate from semi-tropical to temperate, a wide margin is permitted to the grower, and seed can be procured suitable to all parts of the State. In tobacco, as in all other crops, the aim of the grower should be to produce the kind which will command the highest price. The most valuable tobaccos are the Cuban and Manilla, and they owe their fame mostly to the favorable conditions under which they are grown. These places possess a tropical heat, but at the same time are tempered with the sea breeze, and there are, no doubt, parts of the coastal districts of this State which may produce an article that could favorably compare with these tobaccos.

Tobacco thrives best in a good rich soil, rich in vegetable mould, but light soil containing a good amount of organic matter and well drained will produce an excellent smoking tobacco, and on such soil the finest leaves are grown. The more clay in the soil the thicker the leaves become, and the aroma becomes less, and is consequently less suited for the finer qualities of smoking tobacco, although the weight of yield may be heavier.

From the many samples of tobacco sent to this station to judge of their value, I find that the black prairie land will yield more to the acre than any other kind of land in this State, but the tobacco will not possess so fine a quality—on such soil it grows larger, has coarser stems and a heavier leaf, and is not so good for wrappers, or fine cut or cigarettes and cigars as the upland tobacco on sandy soils. Though tobacco is a hardy plant and will grow under varied conditions, yet to become a profitable crop, it must not be grown in a situation very different from that to which it is suited by nature. It must be remembered that the plant is a native of a warm climate, and thrives best in a moist atmosphere; therefore, in such a climate, by employing ordinary means, tobacco may be made to yield a profit not attainable in less favored situations. A warm, moist climate will permit of the selection of the varieties that sell at the highest price in the market, and in a suitable soil the profit will be such as is not often or easily realized from any other crop.

As the Havana tobaccos command the highest price, growers everywhere attempt to introduce and cultivate them. The difficulty in growing these varieties is, they speedily degenerate if the conditions are not favorable. To prevent this deterioration it is important to import and use Cuban seed every one or two years. Virginia tobacco is the most favored in temporate climates, as it does not require such a high temperature, but on account of its botanical characteristics it is not much liked by cigar or cut tobacco manufacturers. A high price is generally commanded, no matter of what variety, which possesses either a light mahogany, cinnamon, or golden color, and fine aroma, with thin ribs far apart and even. The wider the leaf and the less they are worm eaten, or torn, the greater the number of wrappers which can be cut from a pound for making cigars, consequently manufacturers will pay more for grades possessing these qualities than for others.

It may be said of the varieties most generally grown in America, that the Kentucky, Virginia and Maryland are employed for chewing, pipe and cigarette smoking, while the Connecticut seed leaf and Havana are most in use for fillers and wrappers in the manufacture of cigars.

During the last half century the plant has been developed to a greater extent than during the three hundred years succeeding its discovery. Its cultivation and management have been reduced to an approach to an exact science, and the quality of the leaf is, in a great measure, within the control of the growers of the plant; until quite recently it was supposed that the varieties that grew in the tropics could not be cultivated with success in the temperate regions, but recent experiments have demonstrated the fact that the tobacco of Cuba can be grown with success in many parts of the United States. The tobacco raised in the tropics is the finest in flavor, while the more temperate regions produce the finest and best colored leaf.

The tobacco of the tropics, as to the uses to which it is put, is limited, while the tobacco of the more temperate re-

gions can be used for all the purposes for which the plant is needed.

Formerly but little attention was paid to the color and texture of the leaf, the principal object being the production of a leaf of large size, rather than one of good color and of silky texture. Now, these are most important conditions, and give value to the tobacco in proportion to the perfection of these qualities.

III.

FIELD CULTURE.

Land on which it is intended to grow tobacco should be well ploughed; on compact soils the ploughing should be deep. An intelligent rotation of crops carried out with an intelligent knowledge of the needs of the tobacco crop will be the aim of the practical farmer. Before transplanting the young plants from the seed-bed the land should be ridged, the distance between the ridges depending on the kind of tobacco to be planted—the larger kinds requiring more room than the smaller-leaved and tall sorts. Generally from three to three and a half feet apart between the rows, and the same between the plants will be sufficient. Where the surface is level the plough may be run lightly over the field at right angles, thus forming small hills on which the plants are planted.

Choice of Soil.—The growers of the plant are very particular in the selection of suitable soil for tobacco growing. The selection of soil will depend upon the color of leaf in demand, as the soil as well as the fertilizers determine to some extent the color and texture of the leaf.

The effect produced by planting tobacco too near the sea is injury to the leaf, which is apt to be thick and unfit for a cigar wrapper. In some countries, however, notably Cuba, the leaf grown near salt water is equal in color and texture to any grown in the interior.

Generally the plant obtains its finest form and quality of leaf on lands bordering the largest rivers. This is true of the tobacco lands of Connecticut, Kentucky, Virginia and North Carolina, as well as of those in the islands of Cuba and San Domingo; but some of the finest tobacco grown in the United States is grown in localities some distance from large rivers.

When possible, select the kind of soil for tobacco that will produce the color and texture desired. For Connecticut seed leaf a light moist loam is the best soil. For the bright tobaccos, such as are raised in Virginia, North Carolina, South Carolina and Maryland, the soil should be light, or what is commonly called a sandy loam, not too flat, but of a rolling, undulating surface not liable to overflow in excessive rains. New cleared in these last named States is considered better than long cultivated soils. In Cuba the planters select the red soil as the best for fine tobacco. Some planters, however, prefer a soil mixed of one-fourth sand and one-half to three-fourths of decayed vegetable matter.

Both the Cuban and American planters concur in the opinion that a large quantity of silicious matter in soils is essential for the growth of good cigar tobacco. The rich clay loams on the banks of the James River in Virginia do not grow the highest price tobacco, while the less fertile silicious soils of other sections will produce tobacco of superior quality for chewing and smoking. Tobacco of high grade will not grow in the calcareous regions. A better soil is one that rests upon the primary foundation.

IV.

TRANSPLANTING.

Figure 5 shows the plan of placing and setting the plants.

FIGURE 5.

Transplanting should be done in the evening or on a cloudy day. Before transplanting, the seed-bed should receive a good watering so that the plants can be drawn without injury to the roots.

The planting is similar to the planting of cabbage and is no more difficult. A good plan is, for a boy to walk between the ridges, placing the plants alternately to right and left, being followed by the planters, who place the plants in the hills or ridges, taking the precaution to leave the bud well above the surface.

In a few days any missing hills which occur should be replanted, and during the early growth a close watch must be kept for the cut worm, bore worm, and other injurious insects. When the plants have taken root they grow very quickly and subsequent cultivation is simple, though requiring care.

When the plants are from six to nine inches high they

require to be hilled, by mounding the earth around the plants, to protect them from falling when the soil is wet or from being blown down by heavy winds. One or two hoeings are necesary during the growing period to keep down the weeds, as everything that detracts from the growth of the plant is detrimental to the quality of the leaf.

V.

FERTILIZING.

To be of good burning quality, tobacco should not contain more than 0.4 per cent. chlorine to 2.5 per cent. potash (that is, six times as much potash as chlorine), consequently, fertilizers for smoking and cigar tobacco should contain at least six parts of potash for every part of chlorine that is at the disposal of the plant. The closer the relation between potash and chlorine in a fertilizer the less it is adapted for smoking tobacco. A number of experiments have been made, with potassium nitrate, potassium sulphate, potassium muriate, gypsum and common salt as fertilizers for tobacco.

The chlorine compounds always injure the burning qualities, and the potassium sulphate and potassium nitrate often improve this quality, though not always—the failure being due, it is believed, to the potash not being sufficiently distributed through the soil, or where heavy applications are made to the formation of too concentrated solutions.

The tobacco plant gets its growth and maturity rapidly, and requires a constant supply of plant food from the soil, but on the other hand it is exceedingly sensitive to concentrated solutions. It is important that the fertilizer, especially the potash, be thoroughly mixed with the soil to a depth to which the roots extend. This may be accomplished in a measure by applying the fertilizer sometime in advance of planting.

Previous Culture of Land for Tobacco.—The quality of the soil and the manuring are largely responsible for the

early and late ripening and the regular and irregular ripening of tobacco.

Tobacco plants ripen later on soils rich in organic matter, except in the case of sandy soils, where the organic matter decomposes rapidly. Heavy applications of nitrogenous manures retard ripening. Tobacco richly manured with liquid manure, night soil, barnyard manure, or nitrate of soda, ripens late.

If the plants are set late on the fields so manured, or those rich in organic matter, the leaves may not have time to ripen, and a greenish leaf will result, which, in burning, gives an unpleasant odor and bitter taste, and bitter taste in chewing also.

Formulas for Fertilizing for Tobacco.—The following formulas for fertilizing tobacco are recommended:

Formula No. 1.—From 900 to 1250 pounds of wood ashes, or 350 pounds of potassium sulphate per acre, the applications being made to deep soils late in the fall, or to shallow soils before the first plowing. In the spring before setting the plants 135 to 180 pounds of nitrate of soda may be applied when the land is not heavily manured. In rainy seasons, when the plants lose their dark green color, and fail to grow well, 90 to 135 of nitrate of soda per acre may be applied while the plants are small.

Formula No. 2.—Two hundred and seventy-five (275) pounds of low grade sulphate of potash, 250 pounds of acid phosphate (12 per cent.) and 100 pounds of sulphate of ammonia (a by-product of gas liquor) or 280 pounds of cotton seed meal. Sulphate of ammonia, is one of the most concentrated forms in which ammonia can be applied to the soil, and is, at the same time, one of the most active and readily available forms, being decidedly quicker in its action than any form of organic-nitrogenous matter.

Magnesium carbonate, a new product of the Stassfurt industry, of Prussia, Germany, containing 18.5 per cent. of potash, is said to possess good properties in improving the quality of tobacco. In the Connecticut valley, where fine

cigar leaf is raised, nearly all kinds of domestic, commercial, and special fertilizers are used. Of domestic fertilizers, horse manure is considered the best, as it produces the finest and lightest colored leaf of any known fertilizer. Cotton seed meal, when used with domestic manure, is an excellent and strong manure.

Mapes formula is a favorite with many growers of fine cigar leaf in Connecticut.

VI.

THE PLANT.

The plant bears from eight to twenty leaves, according to the species of the plant.

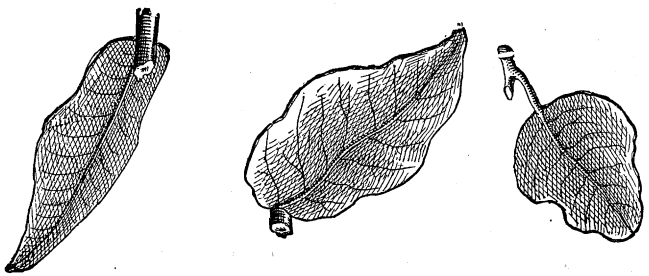


FIGURE 6.

They have, as represented in figure 6, various forms; ovate, lanceolate, and pointed. Leaves of a lanceolate form are the largest, and the shape found on most varieties of the American plant.

The color of the leaves when growing, as well as after curing and sweating, varies, and is frequently caused by the condition of the soil. The color, while growing, may be either a light or dark green, which usually changes to a yellowish cast as the plant ripens. The ground leaves generally ripen first, turning yellow and during wet weather will rot and drop from the stalk if not gathered. The color of the leaf, after curing, may be determined by the color of the leaf while growing; if dark green while maturing in the field, the

color will be dark after curing and sweating, and the reverse if of a lighter shade of green. If the soil be dark, the color of the leaf will be darker than if grown upon light soil. The kind of fertilizers applied to the soil, as well as the soil itself, has much to do with the texture of the leaf, and should be duly considered by all growers of the plant.

The Sucker.—The sucker makes its appearance at the junction of the leaves and stalk, as indicated in figure 7.

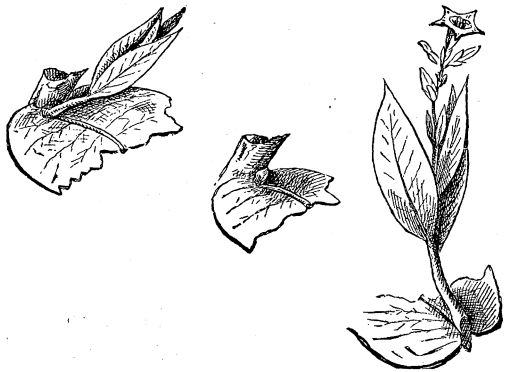


FIGURE 7.

Uusually these are not seen until after the plant has been topped, when they come forward rapidly and if not plucked off in a short time develop into strong, vigorous shoots. The growth of the suckers is injurious to the leaf, retarding their size and maturity, and affect the quality as well as the maturity of the plant. When the plants are fully ripe and ready to harvest, the suckers will be found to be growing around the root of the plant.

This is one of the most reliable evidences of its maturity, as it denotes the ripening of the entire plant.

Breaking off the suckers hastens the ripening of the leaves and gives a lighter shade of color, no matter on what soil the plants are grown.

Topping.—Topping is simply breaking off the bud at the top of the stalk, as represented by figure 8,

FIGURE 8.

to prevent the plant running up to flower and seed.

By this means the best growth of the leaves is secured, and they at once develop to the largest possible size; will ripen sooner, while the quality is much better.

There are various methods of topping, as well as different periods. Some planters top as soon as the capsules appear, while others wait until the plants are in full blossom. If topped before the plants have come into blossom, it should be done as soon as possible, as a longer time will be required for the leaves to grow and ripen than when topping is delayed until the plants are in bloom. Top the plants at a regular height, leaving from nine to twelve leaves, so that the field will look even and also make the number of leaves to a plant uniform. The above method of topping refers more especially to cigar rather than cutting leaf. Those varieties of tobacco suited for cutting leaf should be topped as soon as the flower bud appears; top low, thereby throwing the strength of the stalk into a few leaves, making them

large and heavy. Let it grow from five to six weeks after it is topped, so as to have it thoroughly ripe, thereby giving it the bright, rich, golden color, entirely different from cigar leaf, but desirable for chewing leaf. The custom in the old tobacco States is to top for English shipping from eight to ten leaves; for coal and flue curing, from ten to twelve. In some sections of the United States the plants are not topped at all; the leaves are left upon the stalk until they are fully ripe, when they are taken off.

VII.

INSECT PESTS.

The two most destructive pests that prey upon the tobacco plant after being transplanted to the field are the "cut worm" and the "horn worm," as shown by figure 9.

FIGURE 9.

The cut worm commences its work of destruction in a few hours after transplanting in the field.

During the night this worm begins by eating off the small or central leaves, and often so effectually as to destroy the plant. The best time to find and destroy these pests is early in the morning, when they can be found nearer the surface; with the heat of the sun they burrow deeper in the soil.

Soon after they disappear, the fight with the horn worm commences.

Figure 10 shows the Sphinx, or moth, the parent of the horn worm, the larvae and the horn worm.

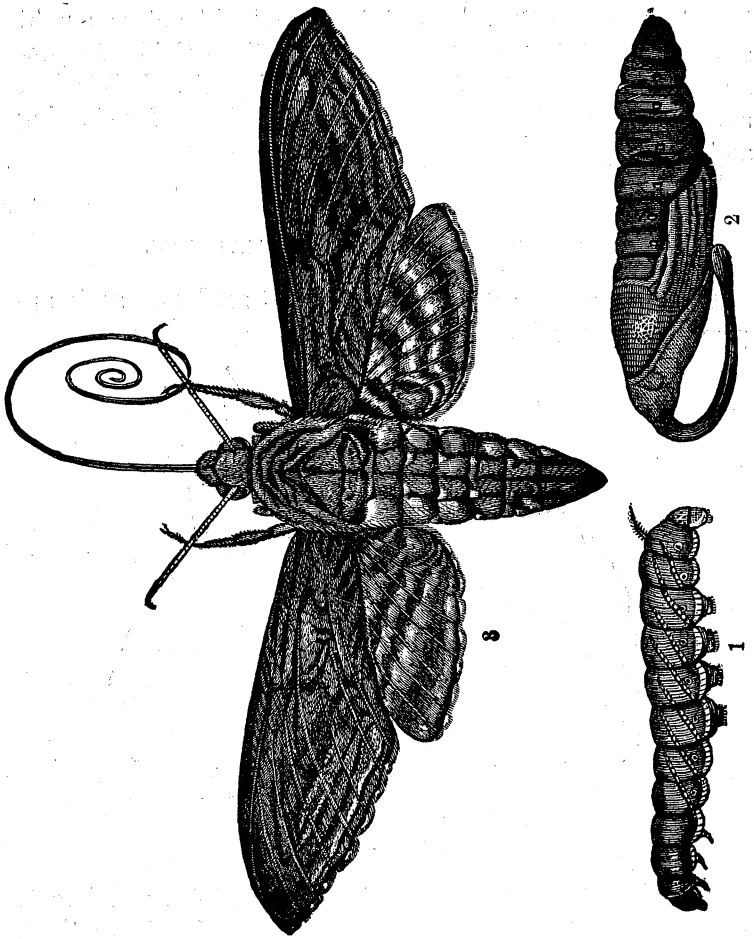


FIGURE 10.

The horn worm feeds upon the finest and largest leaves; eats the leaves in the finest parts of them. They leave large holes which render the leaf worthless for a cigar or chewing wrapper, leaving it fit only for fillers. As the Sphinx, that lays the eggs usually deposits two crops of eggs on the tobacco plant during its growth, it will require much time and labor to destroy the eggs and worms. If this is neg-

lected, the crop will be much injured and will not be sought after by good judges of tobacco. An insecticide for destroying the worms has been advertised by a firm in Virginia and when applied does not injure the tobacco for chewing and smoking.

VIII.

VARIETIES OF TOBACCO AND HARVESTING.

Figue 11 represents the Connecticut seed leaf as it appears ready for harvesting.

FIGURE 11.

The varieties cultivated in the United States and known as "seed leaf" tobaccos, are grown mostly in Connecticut, Massachusetts, Vermont, and eastern and western States.

All of the seed-leaf of the United States is used exclusively in the manufacture of cigars, and is celebrated for cigar wrappers from the superiority of its color and texture, and the good burning quality of the leaf.

This variety grows to the height of about five feet, with leaves from two and one-half to three feet in length, and from fifteen to twenty inches broad. The color of this tobacco after curing is either dark or light cinnamon.

There are two principal varieties of Connecticut seed-leaf broad and narrow leaf—of these two, the broad leaf is considered the finest, cutting up to better advantage in cigar making, and ripening and curing fully as well.

This tobacco has not that fine flavor of Cuban tobacco, but in texture is considered equal to it. It burns freely, leaving a white or pearl colored ash, which is one of the best evidences of a good cigar tobacco.

The leaf is firm and strong, and sufficiently elastic to bear considerable manipulating in manufacture. Thorough cultivation by the growers has made this quality of tobacco one of the most profitable of any cigar tobacco grown in the United States.

FIGURE 12.

This figure represents a plant of Virginia tobacco maturing seed. Virginia tobacco has acquired a reputation which has gradually increased for more than two hundred and fifty years.

The plant grows to the height of from three to five feet; the leaves are long and broad, and when cured are of various colors, from a rich brown mahogany, cinnamon, to a fine golden yellow.

The finest quality of Virginia tobacco comes from the

southside counties, but the amount is small compared to the quanitties of dark raised on the lowlands of the Dan and James rivers and their tributaries. The tobacco grown in the southside and southwestern counties of Virginia is much lighter in color, and of much softer and finer texture than the ordinary Virginia tobacco.

Havana Tobacco.—This famous variety of tobacco, as is shown in figure 13 is considered the finest flavored for cigars that is now cultivated.

FIGURE 13.

This variety grows to a height of from six to nine feet, with oblong, spear-shaped leaves. The leaves when young are of a dark green color, and have rather a smooth appearance, changing at maturity into a yellowish green. It grows quickly, and by careful pruning a fine colored leaf is obtained, varying from a straw color to a dark brown or black.

The finest is grown in Vuelta de Abajo, which is celebrated as a fine tobacco producing district. The Havana tobacco ripens in from eight to ten weeks after being transplanted.

The stalk and leaves are not as large as the Connecticut seed-leaf, but it is better in flavor.

Cutting the Plant.—Figure 14 represents harvesting the plant.

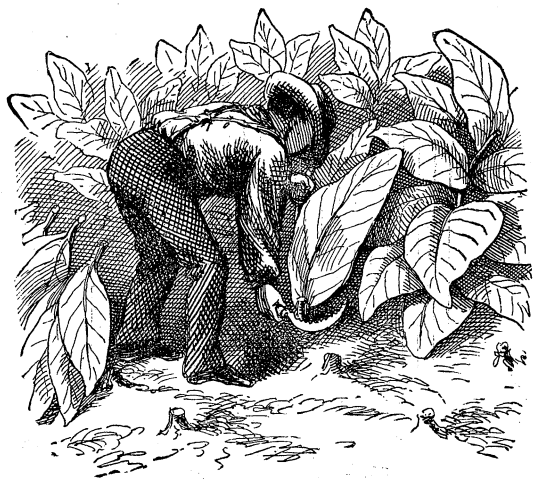


FIGURE 14.

There are two methods of harvesting, cutting down the whole plant or gathering the leaves singly. The former is the one that has been practiced for a long time by tobacco planters; the latter, which is of recent origin, is regarded by many as the most scientific method.

Both these plans of gathering have their advantages, the first is the easier, and permits of quicker handling.

For cutting, a heavy knife is used, and the method is similar to cutting sugar cane, the plant being held with the left hand and cut close to the ground.

The plants should be removed to a shady place to prevent their becoming sunburnt.

IX.

CURING.

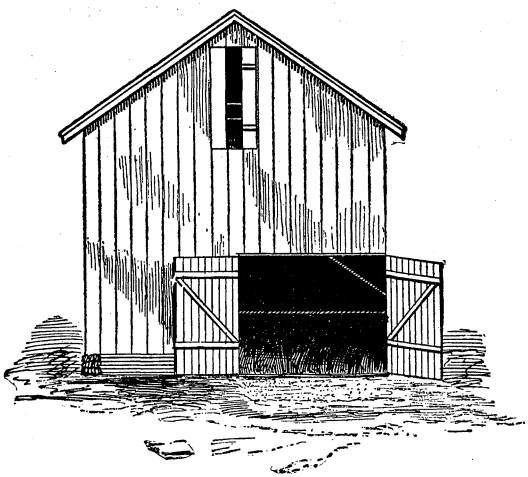


FIGURE 15.

The process of curing now commences, and on the success of this operation depends in a great measure the ultimate value of the crop. No matter how fine the plants may be, or how large the production, an error in curing is sufficient to destroy, in a great degree, the work of the season. The tobacco barn should be built with windows and doors sufficient to insure a free current of air. The barn should be high enough to permit three rows of plants being hung one above the other, say 16 to 18 feet from floor to roof. Figure 15 represents an inexpensive framed barn used for curing where heat is applied with open fire or with furnaces.

There are several methods of curing, viz: With open fires, as shown in figure 15; curing by flues, air curing and sun curing.

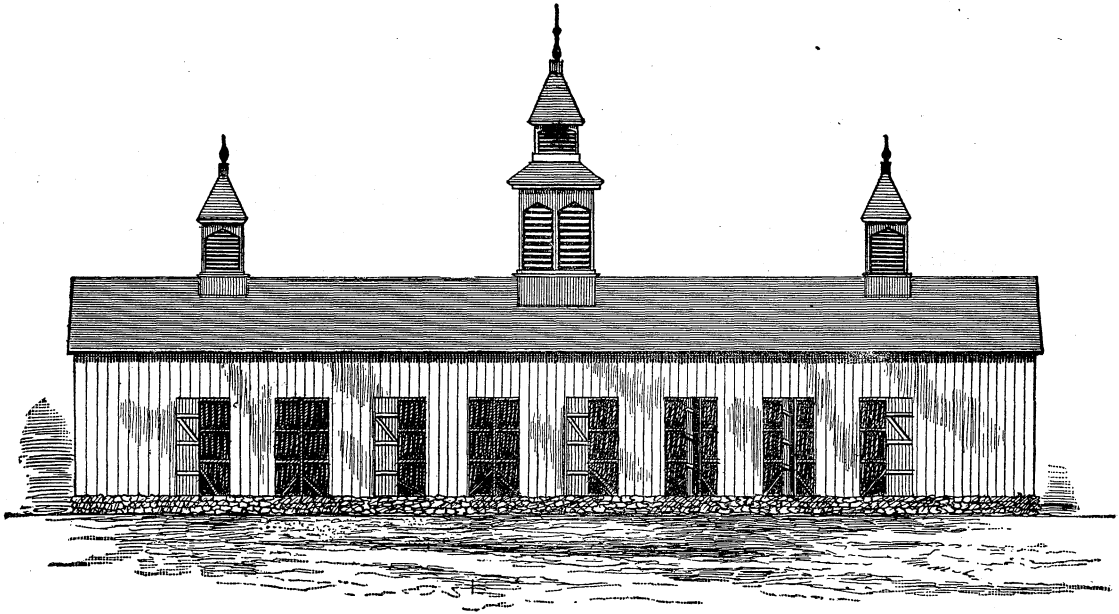


FIGURE 16.

Air curing is the process of curing the plant in the barn, as seen in figure 16. This cut illustrates a barn 32 feet wide, 60 feet long and 27 feet high, with ventilators in the sides and ends, so constructed that they may be opened or closed to admit or exclude air as the condition of the tobacco and weather demands. A barn thus constructed should be closed in very dry or windy weather, closely or partially to give plenty of air during the curing stage, closing the ventilators during the day and opening them at night so that the tobacco may receive moisture to give it a uniform good color, or closing day and night during warm wet weather to prevent mould.

This illustrates a principal of curing cigar tobacco which should never be cured with fire, especially with flues, as the burning qualities will be impaired thereby.

Sun curing is the method of curing in the open air, while firing is the process of curing as above stated, either by open fires or flues in the tobacco barn. The latter method is the one generally practiced in the tobacco sections in Virginia, North Carolina, and to some extent in the West, and is considered the best way of curing chewing tobacco.

Handling for Curing.—There are two common methods practiced of handling tobacco for curing,—the older and long favored method of cutting and hanging the whole stalk with the leaves attached, and the method of detaching the leaves from the stalk before hanging,—a method which is comparatively new in this country, but is employed to considerable extent in Germany and France.

These methods are too long to be discussed fully in this bulletin for the purpose of passing on the merits of either.

SNOW'S MODERN TOBACCO BARN.

This new process of harvesting and cutting tobacco was introduced by W. H. Snow of High Point, North Carolina.

Figure 17 shows the view of this modern barn, which is in operation on this Station.

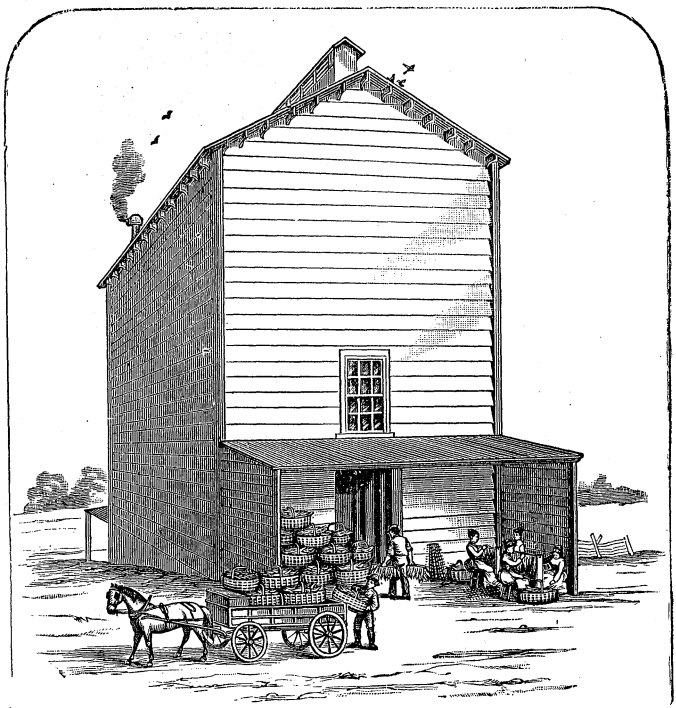


FIGURE 17.

It is not necessary at present to give details for the construction of this barn and apparatus. This system of curing tobacco in the Snow Modern Barn has important advantages. The leaves are stripped from the stalks in the field and brought to the barn in baskets, and strung about the width of a finger apart on pointed wires which project at right angles from a wooden stick. As the sticks are filled they are placed in movable racks in the barn, and as fast as a rack is filled it is raised by a simple device to the top of the building. This is continued until the barn is filled, leaving only as much space between racks as is required for the hanging leaves.

Plan of Housing.—The plan of housing in this barn is illustrated by figure 18.

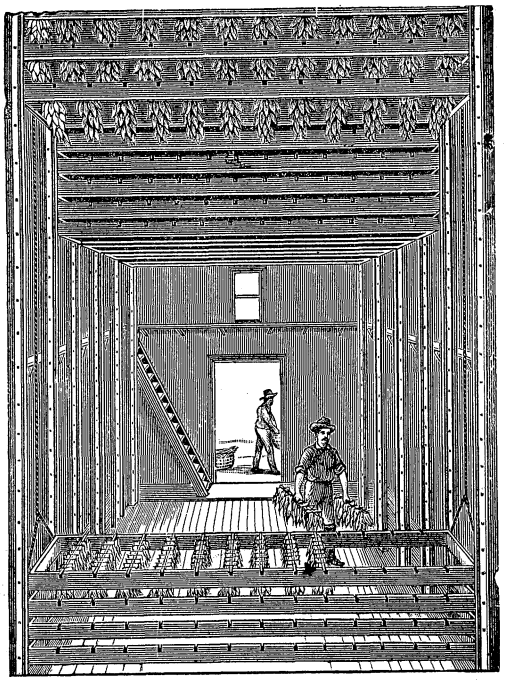


FIGURE 18.

Advantages of the Method.—The following are some of the important advantages in favor of the Snow process over the old:

I. The planter can begin to house his crop from two to four weeks earlier, as the bottom leaves which ripen first can be taken off and cured as soon as they are ripe.

II. As the lower leaves are pulled off those left on the stalk ripen up more rapidly, which enables the planter to get in his crop earlier in the season.

III. The tobacco can be stored in a much smaller space and with no risk of losing color or moulding when bulked down.

IV. Tobacco can be cured with a more uniform color.

V. Less fuel will be required, and the risk of setting fire to the barn will be greatly lessened.

Flues and Flue Curing.—Flues are extensively used instead of open fires for curing yellow tobacco for chewing purposes, and is a better method. The heat is more readily controlled by the use of flues, and tobacco cured by this process is cleaner, brighter and sweeter. The flue is the best mode for applying heat in the curing process for any type of tobacco requiring the application of heat.

X.

STRIPPING.

After the tobacco is thoroughly cured it has to be stripped. The leaves become soft and pliant in damp weather and can be readily taken down out of the barn for stripping. After taking down, the plants should be packed, in order to be kept moist until stripping.

This operation consists in taking the leaves from the stalk and tying them in bundles after assorting the various qualities and keeping them separate. Each hand or bundle of the best grades should contain at least twelve leaves. In the old tobacco States the plant is usually made into three grades—long, short, and lugs, or worm-eaten leaves.

In Cuba the leaves are divided into four classes—first, the leaves at the top of the plant, which constitute the best quality, from the fact that they get more equally the benefit of the sun's rays by day and the dew at night; second, the leaves which are next to the above; third, the inferior or small leaves; fourth, the lug leaves, or those nearest the ground.

The assorting of the plant previous to putting in hands or bundles is an operation that requires judgment and a practiced eye. This mode of assorting colors in stripping is similar to that of shading cigars, in which the utmost care is taken to keep the various colors and shades to them-

selves. Assorting the plant does not imply that it is carried to its fullest extent in point of color, as in shading cigars, but simply keeping those general colors by themselves, like light and dark brown leaves. Figure 19 shows the bundle after it has been stripped, assorted and tied.

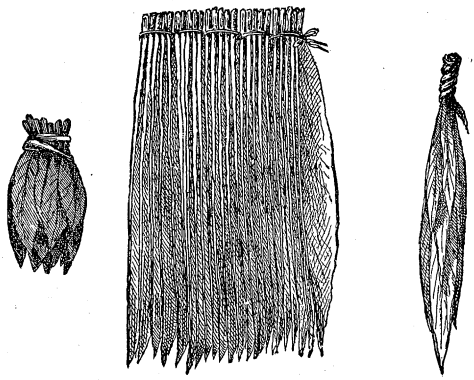


FIGURE 19.

Packing.—After the process of stripping is completed the hands should be packed to keep them moist, or as near as possible in the same condition as when stripped. Select a cool, dry place in the center of the floor of the tobacco barn. Hand the tobacco to the packer, who presses the hands firmly with his knees and hands, laying the tobacco in two rows—keeping the pile about the same height, filling in occasionally with a middle row until all is packed. The different qualities should be packed separately. They can be packed any height or length desired, but usually from three to five feet high will be found a convenient height, while the length may be proportioned to the height or not. After the tobacco is packed, it should be covered with boards and gently weighted with stone or pieces of timber. If the tobacco is packed down in a good case, or keeping condition, which requires experience to determine, it can remain packed until ready for prizing.

It is important to have tobacco in right case for packing. If too dry, it is broken and damaged to a great extent; if too moist, fermentation is so rapid and extensive as to destroy the vitality of the tobacco, and induce mould or rot and spoil its flavor. The right condition for packing is, when the large stems are dry enough to break on pressure several inches down from the butt ends, while the lower part of the leaves should be just soft and pliant enough to not break in handling.

The process of sweating or fermenting perfects it in color, improves the flavor, corrects the acid or pungent taste and increases its burning qualities.

Where tobacco is fermented for cigar purposes, it takes from three to four months to get it ready for working into cigars. In fact, it is believed, that the best cigars can not be made unless the tobacco undergoes a second fermentation the ensuing year, which adds much to its quality.

Prizing Casing and Baling.—This is shown by figure 20.

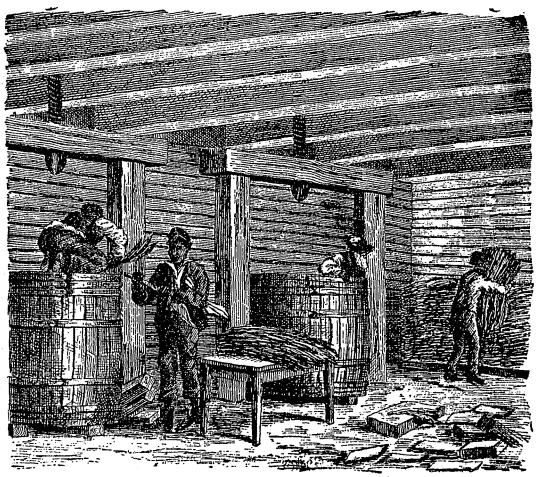


FIGURE 20.

The term prizing originated in Virginia. In the sense in which it is to be taken here is a local word, which the Virginians claim the credit of creating. It is the act of pressing or squeezing the article which is to be packed into any package by means of certain levers, screws, or other mechanical force—this requires the combination of judgment and experience, otherwise the tobacco may become bruised, or crumbled.

All leaf used for cutting purposes and export in America is prized in hogsheads; cigar leaf is usually cased or baled. In some tobacco sections about 800 pounds net is packed in one parcel, while in others from 1000 to 1800 pounds. Tobacco in good condition to prize must be damp enough to bear the pressure without breaking and crumbling, while it must not be too moist or it will rot in the case.

The hands or bundles are packed in the hogshead, or the case in two tiers—when nearly filled, it is subjected to a strong pressure as is shown in figure 21.

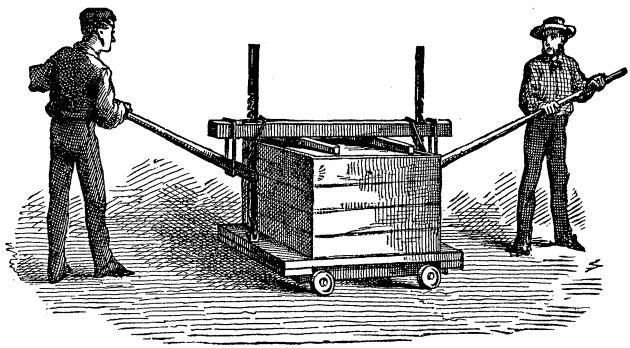


FIGURE 21.

The tobacco should be cased hard so that the mass will rise but little when the pressure is removed. When tobacco is prized or cased in the spring, it will commence to "warm up" as the summer comes, and will go through a sweat. After "going through a sweat" the leaves take on a darker color, and lose the rank flavor which they had before.