

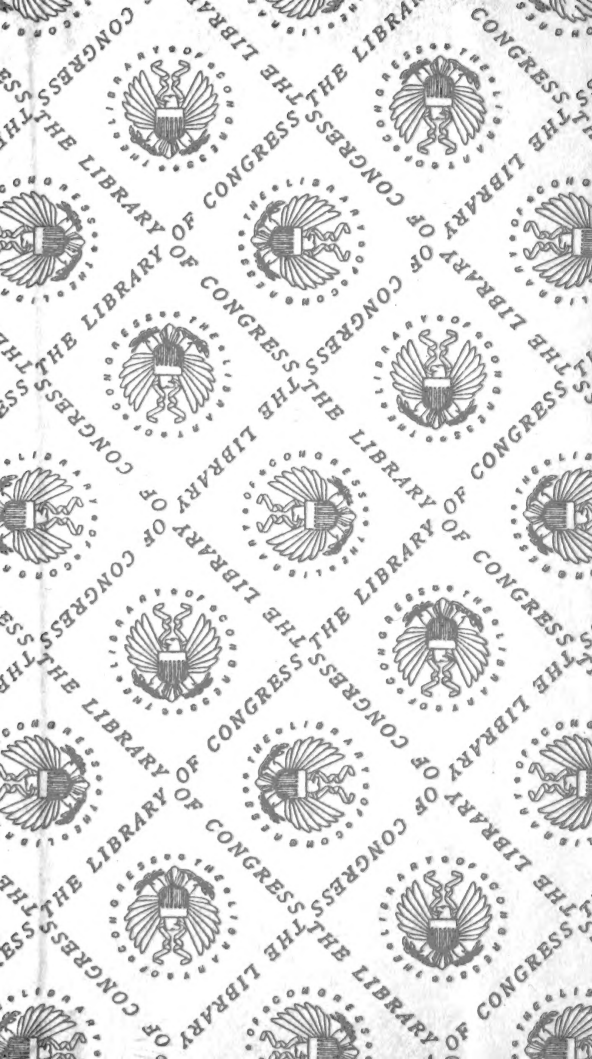
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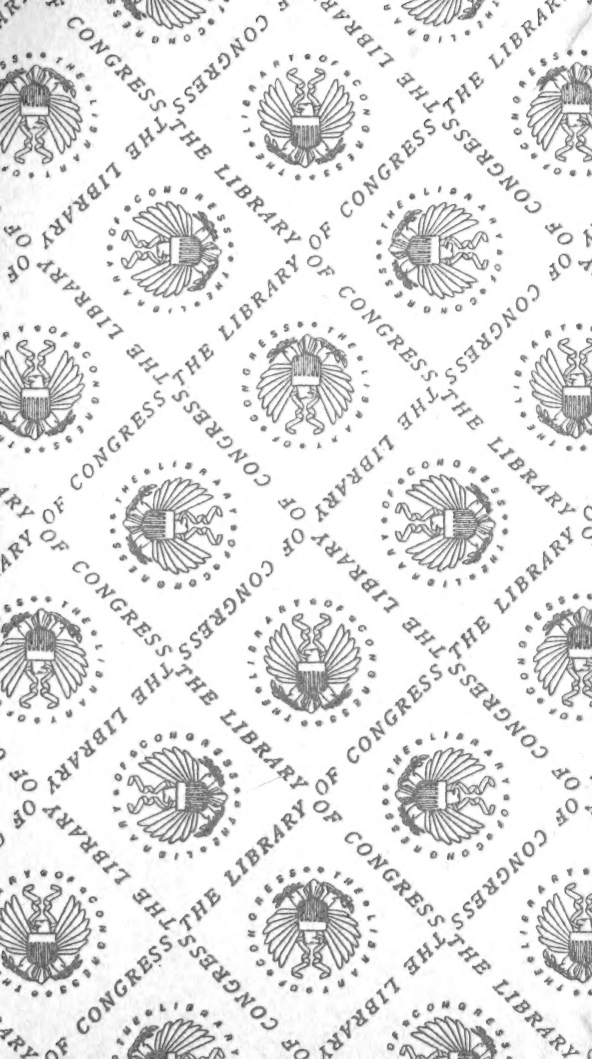
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# TOBACCO!

HOW TO RAISE  
and  
MAKE IT PAY

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By MAJOR R. L. RAGLAND,  
Proprietor of  
RAGLAND'S TOBACCO SEED FARM,  
HYCO, VIRGINIA.

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PUBLISHED AND PRESENTED BY  
**W. S. POWELL,**  
FERTILIZER MANUFACTURER,  
217 AND 219 BOWLY'S WHARF,  
BALTIMORE, MD.  
U. S. A.

Cable Address, "RED BAG" Baltimore.

# FERTILIZERS.

OFFICE OF  
**W. S. POWELL,**  
BALTIMORE, MD.



OWNER OF  
**Powell's Prepared Chemical**  
For making Fertilizers  
at Home.

JANUARY 1st, 1889.

— TO —

## TOBACCO PLANTERS.

Success in tobacco culture so greatly depends upon the proper selection of adapted soil and varieties suited to the several types, and the proper preparation, culture, curing and management of the crop, that, desirous of furnishing tobacco growers with the latest and most approved methods and practice, I have procured from Major Robert L. Ragland, of Hyco, Halifax County, Virginia, the most renowned authority on tobacco culture, a revised edition of his manual on tobacco, prepared especially for me at my request, and now present it to you in the hope that you may find in it a sure guide to help you to raise good crops of the finest quality, which never fail to pay handsome returns. This treatise has been endorsed and approved by the most successful planters in every state where Commercial Leaf, as distinguished from Cigar Leaf, is grown; and I take pleasure in presenting it to you, and recommending it for embodying the latest experience and safest instruction, and confidently hope it will profit all who follow this teaching.

An **IMPORTANT POINT** in raising tobacco successfully is suitable fertilizers. It has generally been thought that any fertilizer analyzing high in Ammonia and Potash would produce large crops of tobacco; this is an error; very often the Ammonia is unavailable and the Potash is the wrong kind.



What I claim for my fertilizers sold for use on tobacco is that they contain the proper ingredients in correct proportions and in available forms for the tobacco plant, and I know my claims are just, because my fertilizers produce the field results and make large paying crops. My "Tip Top" Bone Fertilizer has been sold in the tobacco raising sections for the past twelve years, and I have not had twelve complaints of it not doing all I claim for it. My prices are moderate.

Hoping the reader may appreciate my efforts to increase the tobacco industry and give my fertilizers a trial.

Respectfully,

W. S. POWELL,

Fertilizer Manufacturer,

Baltimore, Md.



# TOBACCO:

## HOW TO CROW AND CURE IT.

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The several grades of tobacco, whether for chewing, pipe-smoking, or cigars, require different soils and management to insure a product that will command an adequate return for the labor and means expended on the crop. It is, therefore, of the highest importance that the planter should know what grade his lands are capable of producing in the greatest perfection, and the modes and management to accomplish the best results from such choice.

A deep rich soil, overlaying a red-clay subsoil, is best suited for *dark heavy shipping tobaccos*.

A gravelly or sandy soil, with a red or brown subsoil, is best adapted to the production of *sweet fillers and stemming tobaccos*.

Alluvials and rich flats produce the best *cigar stock*.

Experience has proved that a gray, sandy or slaty topsoil, with a yellow porous subsoil, is best for *yellow wrappers and smokers*. And these grades are in such great demand, and command so much more in price than any others, that we propose, in this short treatise, to devote to them most space. For, in the production of these the author has had most experience and success; and while the production of "brights" requires more skill and careful management, they seldom fail to make ample compensation for all the attention bestowed upon them.

But unless the planter makes provision by building or arranging suitable barns provided with flues, or prepares charcoal, he need not expect to succeed, and had better aim at some other grade requiring less preparation, cost and skill.

Log barns, ranging from sixteen to twenty feet square, are the sizes mostly used. These should be built about twenty feet high in the body, and covered with shingles or boards. Large logs may be used until the pen is built about seven feet high from the ground. Then if the size is twenty feet, lay off for five rooms, four feet apart, and place tier poles across to form the lower tier. Raise two logs higher all around, and

put on another course of tier poles directly over the first. Then, using smaller logs (cabin size), place on three logs higher all around, laying on tier poles as before, and continue to elevate the body of the barn until you have five tiers. Then place two more logs around and the plates, and the pen is ready to be roofed. You will then have a barn with five rooms and five tiers high. Mark you, the lower tiers are not firing tiers but placed in the barn for the convenience of hoisting, and for storing cured tobacco when necessary. By this arrangement, the tiers are about three feet apart vertically, the body of the barn a cube—as high as it is wide and deep—and the whole arrangement conformable to the process of curing. The roof is so constructed, conforming to the plan of the tiers below, as to contain three tiers above the joist, varying in length. Such a barn will hold about 650 to 700 sticks of medium tobacco, six plants to the stick. To prepare for curing brights, it must be chinked and daubed close inside and out.

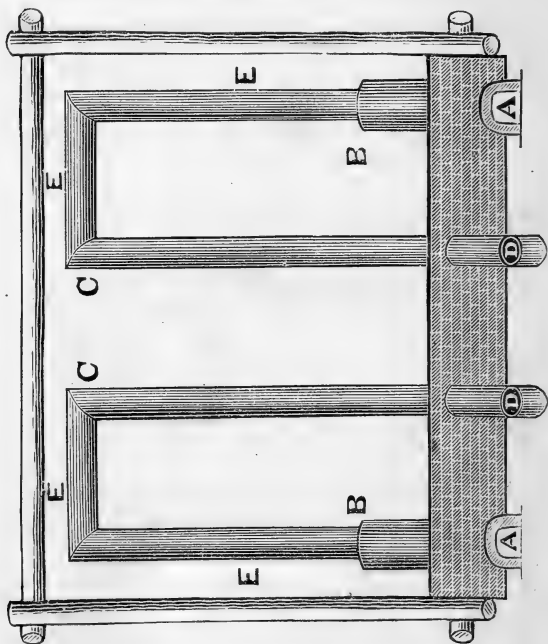
## FLUES AND FLUE-CURING.

Flues have almost entirely superseded charcoal for curing yellow tobacco, as being cheaper and better every way. The heat is more readily controlled by the use of flues—an important item in successful curing—and the tobacco cured therewith is cleaner, brighter and sweeter than that cured with charcoal. The flue is moreover the best mode for applying heat in the curing process for *any type* of tobacco requiring the application of artificial heat, and may be used to good advantage in drying out and seasoning those types cured mainly by the sun and air, and preserving them from injury. Its use is fast “superseding the open wood fire with its objectionable smoke,” as predicted by the writer years ago.

The following cut represents the “Furnace and Pipe” flue, more extensively used at this time than any other, and is not patented. It is cheap and reliable, easily controlled, safe, and may be relied upon to work well.

Cut out two or three logs from the end of the barn as represented by the brick work (see diagram). Then first construct the two furnaces A B and A B with brick or stone, as follows: Let the mouths of the furnaces, A A, project fifteen inches outward beyond the wall—the cut fails to show the projection properly—and extend the furnaces to B B, about five and a-half to six feet. The outer wall of the furnaces should be about fifteen inches distant from the logs or sills of the barn.

Build the walls of the furnaces eighteen inches apart and eighteen inches high at A A, running back to fourteen inches high at B B, and let the bottom of the flues slope upward from four to five inches from A A to B B. The furnaces should be arched with brick or covered with fire-proof stone, or No. 16 or 18 sheet iron, from A to B.

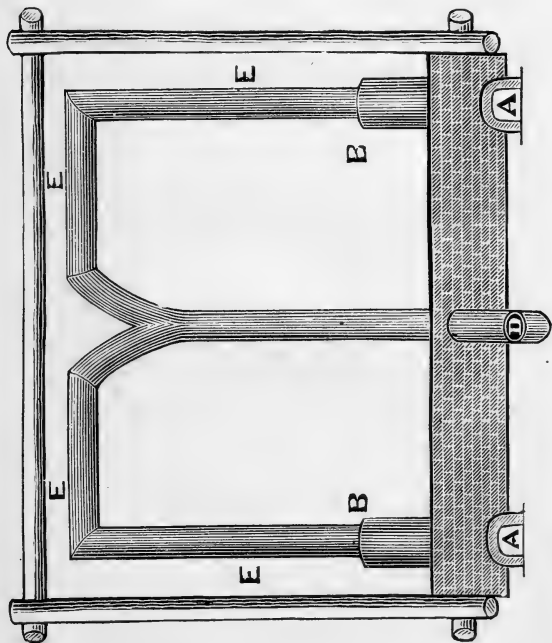


Be careful to see that the furnaces at every point are so constructed as not to come in near contact with the sides or walls of the barn, lateral or vertical, and that the exits of the pipe are protected by brick or stone, as seen in the diagram.

Insert sheet-iron pipes at B B on cast-iron eyes made for the purpose and placed into the ends of the furnaces, as near the tops thereof as possible. The eyes are not absolutely necessary, but they greatly protect the pipe from burning, and

being fixed into the ends of the furnaces, the pipe is more readily adjusted. For a 20 by 20 feet barn use pipe eleven or twelve inches in diameter—for barn 16 by 16 feet use ten-inch pipe. Extend the pipe all around from B B to D D, with a gradual elevation of one foot rise from B to C, and with two feet elevation from C to D. Cap the ends of the pipes with an elbow.

For small barns, the pipes may be brought together midway between C and C, by a V-shaped connection into one-twelve inch return pipe, through the middle of the barn. This flue operates well and is very popular with the planters working a small force and using only small barns, which are better for them than large ones, and is the cheapest good flue made.



Any tinner can make the pipe, and foundries and hardware stores furnish the eyes. The cost of pipe varies from five and a-half to six and a-half\_cents per pound, and ten-inch cast eyes cost about two dollars a pair, and twelve-inch eyes about two dollars and fifty cents. The cost of piping for a small barn varies from eight to ten dollars, or less.

Patented flues cost more, and some of them are well worth the difference in the cost over the plain flue. The "Regulator" is one of the best, and costs very little more, and as a fuel-saver alone will more than compensate for difference in cost in one season's curing. By the use of this flue the heat is more easily under the control of the curer—the temperature being regulated at will by throwing the heat into or out of the barn. The "Regulator" is manufactured at South Boston, Va., by Jordan & Easley.

### SELECTION OF SEED.

There is no farm crop grown as a staple in the United States that pays better than *good* tobacco; and to grow good tobacco requires, in the first place, good seed; for good seed is at the foundation of all successful farming, and more essential, if possible, as regards tobacco, than in any other crop. For in this, the range of types, grades, and prices, are wider than in any other crop, while the seed affect and control all these more than any other factor. Soil, climate, and management, next to variety, operate to determine the character of the product.

The variety must be suited to the type which the planter intends to raise, and the soil must be adapted to the type, or failure is certain. Bright yellow tobacco cannot be produced on dark rich soil, nor rich dark "shipping" on poor gray soil: nor will the rich, coarse varieties produce fine silky yellow goods, or the thin silky varieties make heavy, fat, tough export tobaccos.

There has been a wonderful improvement in varieties of tobacco during the past generation—improvement by selection in the old kinds and the introduction of new varieties, with superior qualities and characteristics for every type of tobacco. None but an old fogey will continue to plant the old, unimproved varieties because they were his father's or grandfather's favorites. The world moves, seeds are improved, and industries developed and advanced. Our ancestors succeeded with the varieties of tobacco they planted, when there was mainly but one type—the dark shipping—but

taste and fashion change, new types are wanted and new varieties suited to these types, and planters who meet the demand are those who make the most money by tobacco planting.

Where is the successful farmer who now sows the old wheats once used by his ancestors? Look at the improvement in varieties in vegetables, fruits, farm and horticultural, in the past century. Seeds, like animals, are greatly improved by propagation of selections and judicious crossing; and especially is this true as regards the improvement of seeds, when carried on under the most favoring conditions of development as to soil, climate, and cultivation. Virginia is the home of the tobacco plant, and here it develops to the highest perfection, and, consequently, here have originated the best and finest varieties. She grows now all the types used in plug tobacco and for pipes and cigarettes; and she has some sixteen hundred square miles of soil suited to another type—Cigar Tobacco—and these soils lie mainly in the Piedmont country, where our people are striving to compete with the West in growing grain. Here is an opportunity that ought to be improved.

It is a recognized fact that where any flora develops to greatest perfection, there is where the *best* seed can be grown. It would pay planters in the South and West, who grow the yellow and dark export types, to get their seeds every year from Virginia, as market-gardeners get seeds from localities where the several varieties develop to greatest perfection, rather than grow their supplies at lower cost, but under less favoring conditions, as to adaptibility of soil, climate, &c. They know where to get the best, and are aware of the tendency to degeneration in seeds generally, and the importance of "a frequent recurrence to first principles," to promote healthy normal growth and maturity.

Planters have no excuse for using poor seeds when pedigree seeds of all types may be so cheaply procured. The cost of tobacco seed per acre ranges from ten to twenty cents—the cost of seed of no other farm crop is so little.

## VARIETIES FOR SPECIFIC TYPES OF TOBACCO.

We all premise by-stating that only an approximate guide may be given for the selection of varieties suited to the several types. The variation in soil and climate in different localities greatly modify the selection, For, what is best in

some localities is not best in others; and trial, at last, must determine what is best in every case. When this is found, it is well to stick to it and plant mainly of this variety, and sparingly of others until a better is found, if possible.

## VARIETIES SUITED FOR THE VARIOUS TYPES.

For dark, rich "shipping," nothing has been found superior to the following: James River Blue Prior, Lacks or Beat-All and Medley Prior.

For sweet fillers: Sweet Oronoko and Flanagan.

For stemming: Long Leaf and Broad Leaf Gooch, Hester, Tuckahoe, Big Oronoko, and Lacks.

For mahogany wrappers: Tuckahoe, Sweet Oronoko, Flanagan, Primus, Long-Leaf-Gooch, and White Stem.

For cutters: Hyco, White-stem Oronoko, Yellow Oronoko, Granville Yellow, Sterling, Lacks, Yellow Prior, and Hester.

For yellow wrappers and fillers: Sterling, Primus, Granville Yellow, White-stem Oronoko, Tuckahoe, Hester, Long Leaf Gooch, Yellow Oronoko and Yellow Prior.

Trial will determine what variety is best for any locality, as no one variety is best for all locations. To plant varieties unsuited to the type, or on soil unadapted thereto, is to invite failure every time.

The leading cigar varieties are: Connecticut and Pennsylvania Seed Leaf, Imported and American Grown Havana, General Grant, Bradley Broad Leaf and several Spanish Strains.

In localities liable to early frost it is *safest* to plant the earliest varieties of the several types, such as Sterling, Primus, Granville Yellow, Hyco, Hester, Sweet Oronoko and Bradley for the manufacturing types, and Havana, Big Havana and Persian Rose for cigars.

White Burley, when grown on rich lime-stone soil, makes a mild type of tobacco in great favor, but this type cannot be successfully produced on silicious soils, such as are best adapted to all other Leaf types; and for this reason, it has invariably proved a failure in the old leaf producing States East. Southern Ohio and Eastern Kentucky produce the best grade of this type.

Sweet Oronoko—the Eastern Burley—makes mild, sweet, substantial chewing and smoking goods, unexcelled by Burley or any other type, when properly grown on silicious soils.

Hyco and Lacks cure readily and more certainly of colors desired in types for which they are recommended.



Hester and Long Leaf Gooch possess greater adaptibility to soils than any others, and therefore succeed where others fail.

Sterling, Yellow Oronoko and Yellow Prior are unexcelled for producing the finest *Lemon Yellow* goods, while Long Leaf Gooch, Tuckahoe and Hester make the finest *Orange Yellow*.

Bradley makes fine manufacturing and good Cigars.

Big Havana is the best Americanized Havana and Persian Rose, the earliest Cigar leaf, is one of the most promising foreign varieties.

### PREPARATION OF PLANT BEDS.

There are two modes for raising plants—in hot bed or cold frame, or in the open air—one or the other of which has preference according to locality; the former being more practised north of forty degrees latitude, while the latter is preferred south of that line. We will here give both, that planters may choose.

*The Hot Bed.*—Select a southern or southeastern exposure, sheltered on the north, dig and shovel out a space five by twelve feet or any required length, to the depth of eighteen inches. Place straw to the depth of three or four inches in the bottom of this trench, and cover with fresh unrotted manure from the stable to the depth of six or eight inches; then cover the manure with soil—woods-mould is best—five inches deep. How to cover the bed with canvas will be presently described.

Tobacco seed is sown on the bed thus prepared at the rate of two teaspoonfuls to a bed five by twelve feet. To sow regularly, mix the seed with a fertilizer, ashes or plaster, and sow in drills three inches apart. When the plants have pretty well covered the surface of the bed, remove the canvas during the day, and only replace it when there is danger of frost, or to keep off the flea-bugs. There is the advantage of having earlier plants by this mode and perfect security against the flea-bug, which will repay for the additional cost of raising at least a portion of the plants needed for the crop by this safe mode.

*Open Air Beds.*—But there is no question that open air beds are cheapest. And where this mode of raising plants is practicable, it is greatly to be preferred for the main supply of plants. It is a well-established opinion that plants raised in the open air stand transplanting better and usually grow off quicker than plants raised in hot bed or cold-frame.

*Selection of Locality.*--On the selection of a proper locality for a plant bed, and its preparation, largely depends the timely supply of strong, healthy plants, without which it is impossible to raise a crop of fine grade. The planter, therefore, cannot be too careful in choosing a sheltered spot, neither too wet nor too dry, as rich naturally as can be found, and located so as to possess different degrees of moisture.

Go into the woods, original forest, if possible, and select a spot near a branch or stream of water, embracing both hill-side and flat, and having a southern or southeastern exposure, protected by woods on the north. Burn over the plat intended for plants, either by the old or new method. The first consists in placing down a bed of wood on small skids three to four feet apart on the ground well cleared and raked. Then fire this bed of wood and permit it to remain burning long enough to cook the soil brown for half an inch deep. With hooks, or old hoes fastened to long poles, pull the burning mass of brands a distance of four and a half or five feet, throw on brush and wood, and continue burning and moving the fire until the bed is burned over. Never burn when the land is wet. It will require from one and a half to two hours to cook the soil properly.

Or, better still: Rake over nicely the plat to be burned, then place down poles from two to four inches in diameter, three and a half to four feet apart, over the entire surface to be burned. Then place brush thickly over the plat and weight down with wood, over which throw leaves, trash or other combustible material; over this sprinkle kerosene oil, and set the whole on fire and burn at one operation.

But any mode of burning the plat will suffice, provided that it is effectually done. After the plat has been burned and has cooled, rake off the large coals and brands, but let the ashes remain, as they are essentially a first-class manure. Then coultter over the plat deeply, or break with grub hoes, and make fine the soil by repeated chopping and raking, observing not to bring the subsoil to the surface, and remove all roots and tufts. Manure from the stable, hog pen or poultry house, or some reliable commercial fertilizer—such as "Tip Top"—should be chopped into and thoroughly incorporated with the soil while preparing the bed to be sown. Experience has demonstrated that it is better to use both.

Powell's Tip Top Bone Fertilizer mixed with equal quantity of poultry house droppings and thoroughly incorporated, makes a most excellent manure for plants, and so does a compost made with Powell's Prepared Chemicals, stable manure

and rich moist earth. The latter when composted in time is the best and surest. But beware of using manure containing grass seed. The judgment of the planter must guide him in the amount of fertilizing material to be applied at this stage; but it is well to remind him that the tobacco plant rarely responds to homœopathic doses of plant food, but that the allopathic usage suits it best.

Sow at the rate of a tablespoonful of seed, which is about half an ounce, on every fifty square yards at first sowing, and later resow with a heaping teaspoonful over the same surface, to secure a good stand. Injury by frosts or bugs may require a third or fourth sowing. Sow a little thick rather than too thin to meet contingencies, and secure a good stand in time.

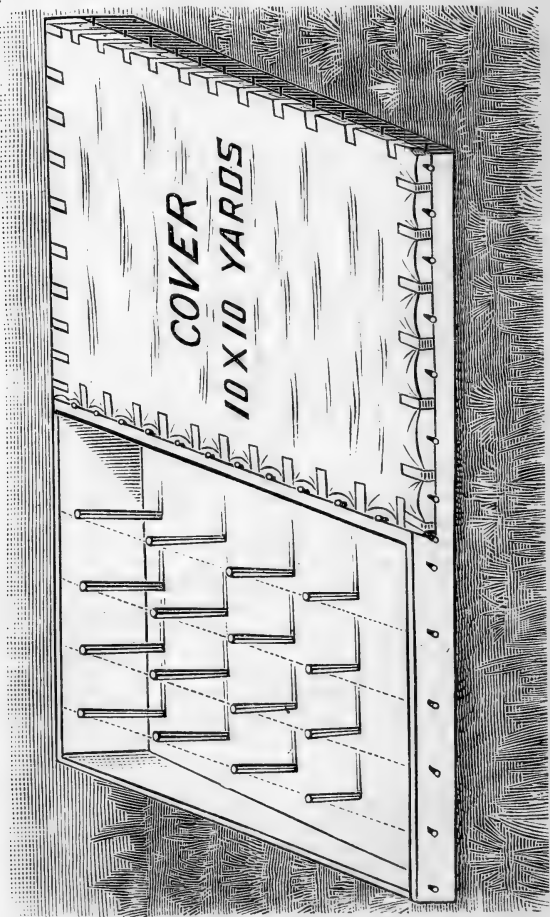
The best way to sow the seed is to mix them thoroughly with a fertilizer or dry ashes, and sow once regularly over the bed, reserving seed enough to cross sow to promote regularity. The tobacco seed is the smallest of all farm seeds, and consequently requires a light covering. If the seed are sown before the 20th of February, the best way is to firm the surface of the bed by treading it over closely, but if sown later, sweep lightly over with a brush or light rake. Then run surface drains through the bed, with inclination enough to pass off the water. To do this properly, run them off four or five feet apart with the foot, then open with a narrow grubbing-hoe to the depth of three or four inches. Then trench deeply around the outside of the bed, to ward off surface water and prevent washing.

*Mulching and Covering.*—Hog hair whipped fine and scattered over the bed, attracts and retains moisture, protects the plants from frost, and acts as a manure. There is no better covering for a plant-bed, but unfortunately it is rarely ever in full supply. Fine brush should be placed thickly over the bed, or if not handy, cover with straw or chaff free from grain. A covering of some such material is necessary, or the young plants are likely to be killed by frost or suffer from drought, and they thrive better with some protection.

*Canvas Covering for Plant Beds.*—A covering of thin cloth has been found to hasten the growth of plants and protect them from freezing and injury by the flea-bugs. This makes the bed warmer, and acts as a cold-frame, the canvas taking the place of glass.

The Water-Proofing Fibre Company, New York, prepare a cloth for plant-beds by a process which greatly promotes durability, while rendering the cloth unfit for domestic use, and

therefore not able to be stolen. It is a good thing, as the writer knows from trial.



The cut on the foregoing page is intended to show how to construct a canvas covering over a plant bed.

First, boards should be placed all around the bed close, so as to prevent the little black beetle, or flea, from creeping through, eighteen or twenty inches high on the upper side and sloping to ten or twelve inches on the lower. Then prepare a lot of small stakes, small round poles, one and one half inches in diameter (make good ones), sawed into lengths graduated from two feet to eighteen inches long, and sharpened at one end. Drive these stakes six feet apart, in rows, through the bed for the laths, two inches wide and one inch thick, to rest upon. The middle lath should be a plank one inch thick and six inches wide. Then drive ten-penny nails, eighteen inches apart, all around the outside of the boarding, and from five to six inches from the top edge. Also drive nails in the middle board, eighteen inches apart. Make the covering in two pieces, each the size of half the bed, say ten by ten yards, and sew on the outer edge, all around each cover, loops of cloth, made of common domestic, eighteen inches apart, to receive a cord or twine, which run through loops all around and tie, and the cover is ready to be placed over the bed and fastened by pulling the twine or cord over the nails all around, letting the two covers meet in the middle over the six inch board. By this arrangement the cover is kept fast over the bed at the right distance above the plants, and may be removed and placed over it at will in less time than by any other known contrivance.

*A Standing Plant-Bed.*—Every planter ought to have a standing plant-bed, which may be secured in the following way: Some time in July or August select one of the best of the old plant-beds, and with hoes shave down the green plants over its entire surface, and cover over thickly with straw or leaves, then place green brush thickly over the bed and weight down with wood. When the whole is dry, some time in the late fall or early winter, set on fire, and thus re-burn over the bed. Then chop and rake fine, sow and trench as when first prepared. Repeat the same operation every year, and, if the bed is manured properly, it will improve and prove a stand-by for many years.

*Unburned Beds.*—Plants may be raised by going into the forest, selecting a moist rich plat, and after raking off the leaves, coultering or chopping the surface fine, manuring heavily, and sowing the seed. But such beds rarely hold out well if the season be dry. They never "repeat" well after the

first "drawing" like burnt beds, which are more reliable for a successive supply of plants as the season advances.

*Time of Sowing Seed.*—The time for sowing varies with the latitude, variety and season. Between the parallels of 35 and 40 degrees north latitude, compassing the great tobacco belt, beds may be sown any time between the 1st of January and 20th of March, and the sooner the better for the bright grades, which ought to be planted early to mature, ripen and yellow, preparatory to being cured early in the fall, when the most successful curings are usually made. Yellow tobacco ought to be planted out in May, but June plantings usually do best in heavy dark grades. The planter will consult his interest by sowing at a proper time to suit the grade he desires to raise.

Plants set out after the 10th of July rarely pay for growing and handling, and if not planted by that time, it will be wise to plant the hills in peas, potatoes, or something else.

*Hastening the Growth of Plants.*—As soon as the plants become "square," *i. e.* have four leaves, you may begin to force their growth, if necessary. Nothing is better at this stage of their growth than to apply dry stable manure, rubbed fine, and sowed over the bed—applying at the rate of five bushels to every one hundred square yards. Be sure to have it dry and fine, and apply when the plants are dry. This is a favorable time to apply a good fertilizer, and the best time to apply it is during a shower, or when it is apparent that one is impending.

Every planter should compost in time stable manure free from grass seeds along with Powell's Prepared Chemicals; using just enough moist rich earth to promote fermentation. Nothing is better than this compost for a top dressing on plants to promote rapid, vigorous, stocky growth, defying the ravages of the flea beetle and hastening their preparation for transplanting.

*Look out for the "Flea-Bug."*—If the "fly," as it is called, begins to devour the young plants, apply plaster, in which rags saturated with kerosene oil have lain for a few hours, covering the plants with the plaster, if necessary, to keep the little pests from devouring them. Repeat the application after every rain unless the flies have left.

A covering of green cedar brush has driven off the fly when other remedies failed, and saved the plants. If the flies are numerous, the planter can save his plants only by vigilant and constant attention. Hard burning, early and thick sowing, liberal and frequent applications of manure, are the best

safeguards, which rarely fail to reward the planter with an early and full supply of stocky plants, and with some left for his less provident neighbors. Some planters, if such they may be called, always fail—some never. Follow the latter, and you will always be right.

Canvas covered beds are the surest protection, and seem the best every way.

## SELECTION OF SOIL, PREPARATION AND MANURING.

The tobacco plant thrives best in a deep, mellow, loamy soil, rich or made so with fertilizers. The subsoil ought to be sufficiently porous to permit the water falling on the surface to pass downward readily, and not to accumulate to drown and stagnate.

If old land is selected, it ought to be fallowed deep in the fall or early winter, that the frosts may pulverize it. Turn under, if possible, some coarse farm manure, for its decay will greatly help to loosen the soil, while furnishing food for the crop. As a coarse manure for yellow tobacco, nothing is better than wheat straw turned under in the fall and winter. The plants rarely fail to ripen yellow in color on land thus treated.

In the early spring more manure may be applied, but it is better that this should come from the compost heap made with Powell's Chemicals. Follow the application of the compost with one-horse turning plows, *crossing* the previous ploughing, turning not exceeding four or five inches deep—about half the depth of the first ploughing. Then, just before it is time to plant, run double-shovel ploughs over the lot, *crossing* the previous furrows, and follow with harrow or drag, *crossing* again to thoroughly make fine. These repeated ploughings, *crossing each time every previous one*, never fail, if the work is done when the land is in proper condition, to put it in proper tilth.

Let the planter remember that "a good preparation is half cultivation," and not stop until the land is in proper condition.

In preparing land for tobacco, be sure you don't plant varieties unsuited to the soil or type, else failure is inevitable. The cause of so much mean, nondescript goods on the markets every year is mainly attributable to failure in planting the proper varieties on the right kind of soil, and planters should carefully note this and sow seed suited *both to soil and type*.

If any one knows of a better way, then let him pursue it—the writer knows of none better. And just here it may be well to state that perfection is not claimed for any mode or practice recommended in this book, but only the best methods known to the author are given, for guidance to the uninitiated. We live and learn, but life is too short to learn every good thing by experience unaided. Every man owes something to those who are to come after him; to freely give as he has freely received.

But the author is not writing for those who know more than he does—and doubtless there are very many—but for beginners, and those having but little experience in tobacco culture. He gives no advice which he has not followed in his own work, and recommends nothing which experience has not commended as the best in theory tested by practice. Those who possess a better knowledge of the subject, and whose practice is verified by results, ought by all means to give the public the benefit of their knowledge and experience. Planters will gladly welcome their teaching, and honor them for their service.

But, to return. Having put the land in nice “order,” lay off the rows with a shovel plough, three feet three inches apart, and follow, drilling along the furrow Powell’s Tip Top Bone Fertilizer at the rate of some one hundred and fifty to three hundred pounds per acre, according to the natural strength of the soil and the quantity of manure previously applied. Then follow with one-horse turning ploughs, lapping four furrows on the fertilized trench, and when finished in this manner your lot is ready to be planted, when the beds have been “patted” with hoes, with “pats” two feet ten inches apart, to mark points for setting the plants. In the older portions of the fine yellow tobacco country the applications are becoming heavier from year to year, some planters using as much as six hundred pounds to the acre.

New ground, or old field that has grown up and been cut down, will require different preparation from old smooth land. But on the former our best brights are raised. Any preparation that will put the soil in fine condition, clear of roots, tufts and trash, is all that is required. Experience teaches that if land is cut down two or three years previous to its being prepared for tobacco, it greatly facilitates the preparation and helps its fertility. Much of the vegetable material, both in and upon the soil, rots, the roots break easily, and the soil is altogether lighter and finer.



While it is economy to dispense with the hand-hoe in making hills on old land—the plough doing all the work, as it ought; when it can be well done—yet on stumpy, rooty and rough land, the hoe is indispensable in the preparation of a hill, as it should be made to receive the plant. But before the hills are made, it may be well, unless the soil is naturally rich, and such is not often the case with soils best adapted to yellow tobacco, to apply some fertilizing material to hasten forward the plants, and mature them properly and early. Here commercial fertilizers have done, and are doing their best work. Bulky, coarse manures often do more harm than good on new and puffy soils. The smaller the bulk, and the more concentrated the fertilizing elements the more readily they are appropriated and assimilated by the plants, if of the right material, and in the most available form. Nitrogen, phosphoric acid, potash, lime and soda, are most necessary for the tobacco plant; and a fertilizer which supplies the relative quantity of each, and from the proper sources, will never fail to show good effects therefrom, if the rainfall is sufficient to quicken their action.

Most of the soils best adapted to the finest types of tobacco, especially bright and sweet fillers, are thin and poor, and need plant-food to push the plants forward and rapidly in growth and maturity, so that the product may be ripened and mellowed of yellow color, preparatory to being housed and cured.

Good crops of fine quality have been produced on these poor gray soils by the aid of fertilizers (commercial) alone; and it has been demonstrated, that Powell's Tip Top Bone Fertilizer, as well as compost made with Powell's Chemicals are wonderfully effective in furnishing the necessary plant-food at the proper time to insure full crops of extra fine quality.

Extensive areas of poor gray silicious soils in the yellow belt are rendered capable of producing good crops of fine yellow tobacco, by the aid of commercial fertilizers alone, when of composition suited thereto.

*Mode of Applying Fertilizers.*—Planters differ in the manner of applying fertilizers, whether in the hill, drill or broadcast. That the same quantity will go further and produce larger results the first year, for the quantity used when applied in the hill or drill, is generally conceded. But advocates of broadcasting claim that when the crop, to which the fertilizer is applied, is to be followed by another in quick succession—to be sown in wheat as soon as the tobacco is removed—then

broadcasting is the best, for reasons which seem too apparent to need explanation.

Having prepared the land for hilling, apply the fertilizer by whichever mode the planter prefers, and in such quantity as the natural strength of the soil indicates, laying off the rows three feet three inches apart, and make the hills about two feet ten inches distant from centre to centre. Mark the measure on the hoe-handle and require the hillers to apply it frequently as a guide. The rows should be wider apart than the hills, to afford proper cultivation without breaking and bruising the plants at the final ploughing--a matter of no small importance, as the least blemish on a fine leaf nearly destroys its value as a wrapper.

*Planting.*--Having prepared the hills, you are ready to plant any time after the 1st of May. Planting is often most effectually done when the hills are being made in May, and the land is moist with the winter's sap, by planting in the afternoon the hills made the same day. If properly planted, very few of the plants will fail to live. Observe to draw the plants one by one from the bed, and handle so as not to bruise them. It is a waste of time and plants to set out very small plants, but wait until they are of proper size--the largest leaves about two and a half to three inches wide. Put a basket of plants in the hands of a boy or girl, who drops a plant on each hill, dropping in one or two rows, according to age or expertness. The men follow, with each a planting peg made of hard wood, six inches long, one and a quarter inch in diameter at large end, and tapering to a point. Each planter takes a "hand plant" to start with (unless the dropper has learned to drop two plants on the first hill), and pushing his planting peg some two inches into the hill, withdraws the peg, inserts the plant, and by a dextrous movement of the peg and the knuckles of the left hand, closes the dirt gently but compactly around the roots. He then picks up the plant on the hill as he moves forward, and by the time he reaches the next hill has adjusted the plant in his hand to insert into the hole in the next hill. Thus the "hand plant" facilitates the work. Try it and you will be convinced. There is art in planting properly, as is shown in the increased number of living monuments that attest superior work. But why enter into such minute details? say some. That you may start right, shun the errors of inexperience, and practice at the start the best methods, as demonstrated by successful practice.

If the soil is dry when the hills are made, then it will require a "season" for planting. The best come with showers. It is

not well to plant soon after a soaking rain, but wait until the land settles. If the plants are good, seasons favorable, and the planting well done, very few will die if transplanted before the 10th of July. After that time all is uncertainty. Hence the importance of getting a stand before that time.

After planting over, it will be necessary to replant from time to time as seasons occur, embracing every opportunity to fill up the missing hills. If cut worms are troublesome, hunt for and destroy every one as far as possible; for it is useless to put a plant in a hill where one of these pests has taken up quarters, and expect it to live and grow.

*Cultivating.*—It is important to commence cultivation soon after planting, to loosen the soil and start the plants growing. Just at this point many planters fail to do their duty, which no subsequent work can atone for. Early, rapid and thorough cultivation is necessary to produce first-class tobacco. If the preparation has been thorough, thrice ploughing, followed each time with a hand-hoe, will suffice for the crop.

For the first ploughing, no implement is better than the wing coulter, the next best the cultivator or double shovel with the coulter points. The second ploughing may be effectually done with the turning plough or cultivator; if grassy, use the first. The last ploughing is most effectually done with three furrows with the single shovel---a furrow on each side, then splitting the middle with the third and last furrow.

Never "scrape down" tobacco with the hoe without putting back on the hill or bed as much dirt as is scraped down. This will prevent baking, and save many plants should a dry spell follow the hand-hoe working.

Any process which stirs the soil effectually and often, and keeps the plants free from grass and weeds, will constitute good cultivation, no matter how and with what implement done. Old land will require more work in cultivation than new, and dark grades more than bright. Short singletrees should be used after the plants are half grown, to prevent tearing and breaking the leaves.

The yellow grades should be cleared of grass and weeds before the first of August, and not plowed thereafter; but the hoes may be used at any time to clear out the crop till the leaves commence graining. The longer tobacco is ploughed the later the plants will be in ripening; therefore, the importance of giving early and thorough cultivation. Any one who can raise good cabbages ought to know how to cultivate tobacco, as the cultivation is very similar. Sometimes it becomes necessary to push the plants forward, where previous

manuring has proved inadequate, to hasten ripening, so as to escape frost and to cure well. I would advise the use of some good standard fertilizer, applied around the plants, in quantity about 150 pounds per acre, and earth scraped upon the fertilizer around the tops of the hills as applied. Powell's Tip Top Bone Fertilizer has proved effectual and may be relied upon.

## PRUNING AND TOPPING.

Under this head there is wide difference of opinion. Breaking off the small and inferior leaves of the plant near the ground is called "priming," or pruning proper, which operation is done along with the "topping," if done at all. There are advantages for and against priming, but all resort to topping—plucking out the seed bud and adjacent small leaves with the thumb and finger. Some contend that pulling off the lower leaves saps the plants and retards the growth if the weather is dry. That permitting the lower leaves to remain on the stalk protects the upper ones from sand and grit, makes them cleaner and therefore more salable. Sand and grit are the terror of the tobacco buyer. On the other hand, it is contended by some that by pulling off the lower leaves, which are generally useless, the remaining leaves receive more nutriment and contain more wax, oil and gum, and that the lower leaves harbor worms and make the worming process more tedious.

It is best to wait until a considerable number of plants begin to button for seed before commencing to top. Topping should be the work of experienced and trusty hands—men who can top, leaving any required number of leaves on a plant without counting. The secret of this—no longer a secret to the initiated—is, that the topper soon learns to know that counting the bottom leaf and the leaf that hangs over it in the third tier going upward, make *nine* leaves, including both top and bottom leaves. Fixing this in his mind, the topper has only to add to or deduct from this *index leaf* marking *nine*, to leave any desired number of leaves on each plant with certainty and without counting. Young man, if you don't know how, get some old negro to show you. Topping, you will find, is a slow business if you have to count the leaves on all the plants topped. If the plants are not "primed," then the "bottom" leaf must be fixed by the eye, looking upward for the leaf in the third tier, which hangs over it, to catch the cue as before. If priming is done, don't err in pulling off too many leaves. No regular rule can be

given, so the planter must judge for himself. The reason given for waiting until many plants are ready to be topped is mainly that more plants may ripen together, and be ready for the knife at the same time. This is an advantage that applies with strong force to all tobacco intended for flue curing.

The number of leaves to be left on each plant varies according to the time the work is done, early or late, the appearance and prospective development of the plant, the season, whether propitious or unfavorable, strength of the soil, and amount of fertilizing material applied. On medium soils, in ordinary seasons, the first topping should be from ten to thirteen leaves—rarely more—for brights. For sweet fillers from nine to ten, and for dark, rich shipping, from eight to nine leaves are enough. As the season advances reduce the number of leaves accordingly; remembering that quality, more than quantity regulates returns.

### WORMING AND SUCKERING.

Many devices have been resorted to in order to lessen the number and mitigate the ravages of the horn worm, but the lack of general and continued efforts from year to year has brought only partial relief. Some years they come in great numbers, and, despite the best efforts of the planter, seriously damage his crop. Perhaps the next year they are few, and give him no trouble. It is the nature of this insect to raise at least two broods during the year. The hawk-moth or tobacco-fly usually makes his appearance in Virginia in the month of May. The eggs deposited by the first moths hatch out in from five to seven days larvæ or worms. The worm sheds its outer skin twice before it gets its growth. The growing stage of the worm lasts from twenty-five to thirty days, and after it has attained its growth it gorges itself a few days longer, and then crawls or burrows into the ground, where it soon passes into the pupa state; and after some twenty-three or twenty-five days from the time of its crawling into the ground the pupa sends forth a moth to lay more eggs and hatch out more worms. Each moth is capable of laying on an average two hundred eggs. So that for every moth in May we may reasonably expect at least one hundred worms of the first brood; and if none of these are destroyed, but all allowed to change to moths, and these latter to raise a horde of worms, what wonder that the second brood sometimes appears in such countless numbers as to defy all efforts to destroy them before they have ruined the crop. Every moth

MOST EVERY

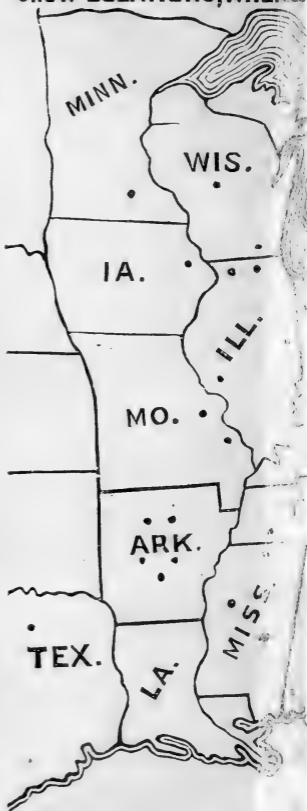
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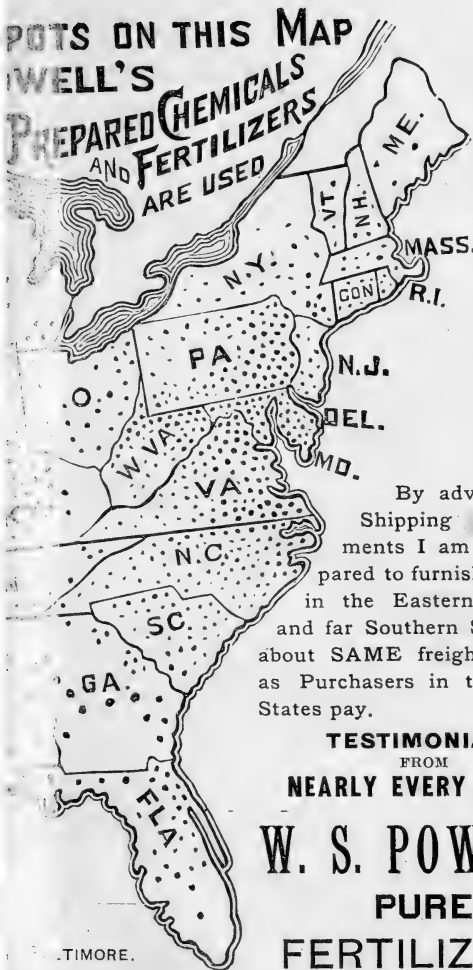
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ought to be destroyed as they appear, and this may be done to great extent by injecting a few drops of sweetened Cobalt (which is a poison) into the flowers of the Petunia, Honeysuckle, or Jamestown (Jimpson) weed, which will give them their final quietus. But this hunt for the moth is not general, and if it were some would escape. But if every planter would wage a war of extermination on the *first brood* of worms—unfortunately a thing rarely done—they would never appear in such unconquerable hordes later in the season. The suckers should be pulled off every week as they appear, and ought never to be permitted to get over two inches long; for, if permitted to grow large they abstract much that would otherwise go to perfect a rich, silky leaf. No planter need expect a crop of fine grade who does not pull off the suckers while small, and prevent the horn-worms from riddling the leaves.

### RIPENING.

The *Leaf* type, as contra-distinguished from *Cigar* tobacco, is known to be ripe when its color changes from green to a greenish yellow, thickens, so that when the leaf is folded over—the under surface being outward—and pressed between the thumb and finger it cracks open. The upper surface of the leaf is roughened, for reasons stated under *Science of Curing Yellow Tobacco*, and generally of a mottled yellow and green color. Ripening of this type usually takes place in Virginia and North Carolina in about five to six weeks after the plants have been topped, sometimes longer when growth has been retarded by drought. The *Cigar* type ripens about two weeks sooner after topping.

### CUTTING AND HOUSING.

Do not be in a hurry to begin cutting your tobacco until it is ripe, and enough fully and uniformly ripe to fill a barn. A thin butcher or shoe knife, well sharpened, and wrapped with a soft cloth around the handle and extending an inch along the blade, will do the work effectually and be easy to the hand. Try it. Put knives into the hands of experienced cutters only, men who know ripe tobacco, and will select plants uniform in color and texture, and will cut no other. Have your sticks already in the field, and placed in piles convenient—sticking a stick vertically in the ground over each pile that they may be more easily found when wanted. Pine sticks



rived three-fourths of an inch by one and one-fourth inch, and four and one-half feet long, drawn smooth, are best.

Start together two cutters and one stick holder—the cutters carrying two rows each and the stick-holder walking between them. The cutter takes hold of the plant with his left hand at the top near where the knife enters the stalk; with his right he splits the stalk down the centre (observing to guide the knife so as not to sever the leaves) to within three inches of the point he intends to sever the stalk from the hill; and as the knife descends his left hand follows the slit or opening, and when the plant is severed from the hill, by a dexterous movement of the left hand the plant is straddled across the stick in the hands of the holder. When the stick has received about six medium plants, if intended for brights, it is ready to go to the barn, either carried by hand if near, or hauled on a wagon if distant. If it is necessary to use the wagon, prepare a bed sixteen feet long to hold three coops on piles, on which place tobacco as cut, and after placing twenty-five or thirty sticks of cut tobacco on each coop, drive to the barn to be unloaded.

Tobacco suitable for brights is best handled in this way, as it is bruised less than if handled by any other mode. Try it, planters, and *know* for yourselves. Very heavy tobacco will break less if, after being cut by the above mode, the sticks are placed gently on the ground and the plants allowed to wilt before being removed to the barn. But tobacco of medium size bruises less to handle it without wilting. Cutting and housing by this mode you never have any sun-burned tobacco. For brights, it has been found best to commence curing at once, as soon as the barn can be filled.

### “SUN-CURED TOBACCO.”

Just here it may be well to give our practice in sun-curing. If the crop is too rich and coarse for brights, then it may be good policy to cure it sweet. To do this properly, erect scaffolds at or near the barns, on which place the tobacco as soon as cut. But some, in order to obviate the hauling of heavy green tobacco, place the scaffolds in or near the tobacco field. But it is never safe to scaffold tobacco away from the barn; for after the leaf is partially dry it ought never to be caught out in the rain; which may happen if tobacco is placed on scaffolds away from the barn. When rain threatens, that on scaffolds near the barn may very soon be placed out of danger, but not so that on scaffolds afar off.

## CURING SWEET FILLERS WITH FLUES.

To cure fillers with flues, when the tobacco is placed in the barn as soon as cut, raise the heat in the barn to eighty-five or ninety degrees Fahrenheit, and then go about other business. Kindle fires in the flues every morning, raising the heat to ninety degrees, and then leave as before, and continue to do this for four or five days until the tobacco is thoroughly yellowed. If the tobacco has much sap, it may be necessary to continue the yellowing process from five to seven days to yellow properly. After this very little flue heat will be necessary to dry out the tobacco. If rains occur before the tobacco is thoroughly cured, raise fires in the flues and dry the leaf, as often as may be necessary.

## TO CURE MAHOGANY COLOR.

After the tobacco has yellowed sufficiently on scaffolds or under flues, and when the leaves have assumed a mottled, piebald appearance, run the heat to one hundred degrees and let it remain at that point for three or four hours. Then raise the heat two and a half degrees an hour until one hundred and thirty is reached. Keep the heat at this point until the leaf is cured, and then move up gradually to one hundred and sixty or one hundred and seventy, and thus cure stalk and stem. If cured properly there will be much of the leaf *mahogany*, while the remainder will run from a bright dapple to a cherry red.

## “SHIPPING TOBACCO.”

Dark heavy shipping—and nothing which does not possess size and substance is fit for this grade—may be cured with flues better than in any other way. Smoke from the open wood fire is objectionable, and with the flue you get the heat, which is all that is wanted, without the smoke. Curing with open wood fires belongs to the past, and none but the old Bourbons will continue the old practice, because they know no better. Taste and fashion are against smoke, and nothing else is needed to banish the old and recommend the new mode. If a dark color is desired, which is not so fashionable as formerly, it can be secured as easily over flues as over wood fires. But the world wants colory tobacco, and this can be produced certainly better with the flue than in any other way. Besides, by the flue the leaf is cured sweet and free from smoke or soot.

A skilful curer can produce the colors most in demand, and by the flue better, and with more certainty, than in any other way. The main object of the author is to induce planters, who have never used flues, to try them for all grades.

### CURING "BRIGHT YELLOW TOBACCO."

There are two modes for curing yellow tobacco—one with charcoal and the other with flues. The first is the primitive mode, but is fast giving place to the latter, which is cheaper and more efficient, and is being adopted by most of our best planters. The chief agent in either mode is heat—a dry, curing heat—to expel the sap from the leaves, stems and stalks of the plants, and catch the color, *yellow*, next to Nature's color, green, and to fix it indelibly. This is the *science* of curing *yellow* tobacco. There are seven prismatic colors—that of green tobacco occupying the middle of the prism. By the process of nature, leaves in drying descend in color from green, first to yellow, then orange, then red, and finally lose all color as they go to decay. Now, a quick dry heat, so regulated as to dry out the leaf and catch the yellow, and fix it, is the *modus operandi* of curing fancy bright tobacco.

A barn containing seven hundred sticks of green tobacco, six medium plants on each stick, holds along with the tobacco four thousand five hundred to five thousand pounds of water, which must be expelled in from eighty-five to one hundred hours.

Charcoal produces an open, dry heat, well suited for the purpose; but its preparation is costly, its use tedious, dirty and laborious and it deposits a black dust on the leaf that is objectionable. With flues (see diagrams) constructed with furnace and pipes, the wood is burned as cut in the forest or old field, and the whole process of curing is less costly and less laborious, and the tobacco cured therewith free from dust, and has a sweeter flavor. The flue process possesses so many advantages over all other modes of curing tobacco, is so safe, if properly constructed; and free from smoke, that when its merits become better known, it will come into general use and supersede all other modes.

The first step in curing is called the *Steaming or Yellowing Process*. Medium tobacco will require from twenty-four to thirty hours steaming at about ninety degrees to yellow sufficiently; but tobacco with more or less sap, larger or smaller, will require a longer or shorter time to yellow. Here the judgment of the curer must be his guide. Inexperienced

planters would do well to procure the services of an expert curer, if they have tobacco suitable for fine yellow. The planter saves in enhanced value of his crop many times the money paid to the curer, and besides, by close attention, he may learn in one season to cure well himself. Theory alone, however good, and directions, however minute, will not do here, but it is *practice* that must qualify one to cure well.

When it is remembered that no two plants are exactly alike, no two barns precisely similar in every particular, and that the weather may change every hour, is it reasonable that a fixed programme can be followed for every curing with any certain hope of success? The experienced know better. On work so variable, only general directions can be given. The planter here must use his head as well.

The next step is called *Fixing the Color*. When the tobacco is sufficiently yellowed, best leaves of a uniform yellow, and the greener ones of a light pea-green color, it is time to advance the heat to one hundred degrees; observing the leaves closely to detect sweating, which will soon redden and spoil the color, unless driven off. To do this, open the door and let it stand open and if after an hour or more the sweat has not disappeared, open a space between the logs on opposite sides of the barn to let in more air, and permit it to remain open until the tobacco has dried off all appearance of the sweat. To dry off the sweat speedily, sprinkle dry straw or hay over the floor and set fire thereto, using just enough straw to accomplish the desired result. Right at this point more curings are spoiled than at any other stage of the process. It may be well to remember what is a fact, that at least five curings are spoiled by proceeding too *fast*, to one failure from going too *slow*. Now stick a pin here.

But to go back to the barn, where we have just dried the leaf, and where the thermometer indicates a fall of five or ten degrees—but this need not concern the curer to put him out of hope, for a little cooling under the circumstances was necessary—we close up the opening and raise the heat to one hundred degrees. But a skilful curer detects the first indications of sweat, and prevents it by regulating the heat and ventilation.

Keep the heat at one hundred degrees for four hours, and then advance two and a half degrees every two hours, until one hundred and ten degrees are reached. Here you have reached the most critical point in the difficult process of curing bright tobacco. The condition and appearance of the tobacco must now be the curer's guide. No one can success-

fully cure tobacco until he can distinguish the effects of too much or too little heat in the appearance of the leaf. Too little heat, in fixing the color, operates to stain the *face* side of the leaf a dull brown color, and is called "sponging," and may be known to the novice by its appearance only on the *face side* of the leaf. Too much heat reddens the leaf, first around the edge and then in spots, which are visible on *both sides*. Now, to prevent sponging on the one hand and spotting on the other, is the aim of the experienced curer. No definite time can be laid down to run from one hundred and ten to one hundred and twenty degrees. Sometimes four hours will suffice, then again eight hours is fast enough. While it is usual at this stage to advance about five degrees every two hours for medium tobacco, the condition of the tobacco often indicates, to the practiced eye, the necessity for slower or faster movement. But it is safe not to advance above one hundred and ten degrees until the tails begin to curl up at the ends. Arrived at one hundred and twenty or one hundred and twenty-five degrees, this is the CURING process. The heat should remain at or near these figures until the leaf is cured, which will require from six to eight hours, according to the amount of sap in the leaf to be expelled. When the leaf appears to be cured, advance five degrees every hour up to one hundred and seventy degrees and remain until stalk and stem are thoroughly cured. To run above one hundred and eighty degrees is to endanger scorching the tobacco, and perhaps burning both barn and tobacco.

To recapitulate—

First. Yellowing process, 90 degrees from 24 to 30 hours.

Second. Fixing color, 100 degrees, 4 hours.

“ “ “ 100 to 110, 2½ degrees every 2 hours.

“ “ “ 110 to 120, 4 to 8 hours.

Third. Curing the leaf, 120 to 125, 6 to 8 hours.

Fourth. Curing stalk and stem, 125 to 170, 5 degrees an hour.

And continue at one hundred and seventy degrees until stalk and stem are thoroughly killed and dry, which usually requires from 12 to 15 hours.

## THE NEW METHOD.

The curing process for yellow tobacco, as heretofore laid down, was first published in the year 1871, and was the first systematic treatise given to the public on the difficult art of curing yellow tobacco; and it has remained substantially un-

altered through six editions of the pamphlet, aggregating largely over 100,000 copies. Thousands in several States have taken it for their guide, and been enabled to learn to cure successfully, without any other assistance. But the yellow tobacco industry has greatly progressed and extended during the past decade, and new light has come through experience to further perfect the art of curing.

The following is given as the latest improvements in curing tobacco:

House the tobacco as soon as cut, and after warming up the barn for two or three hours, at a temperature of about 90 degrees, advance the heat rapidly up to 125 degrees—or as high as it will bear without scalding the tobacco—letting the heat remain at 125 degrees only a few minutes, and then, by drawing the fires and turning the dampers, cut off the heat and let the temperature of the barn descend to 90 degrees.

This is generally called “sapping.” The *rationale* of the process is this: The heat, by expansion, opens the sap cells and starts the water to the surface, facilitates evaporation and hastens the yellowing process.

This “limbering up” process, of high heat at the start, must be of *short* duration, or else great injury will be done to the tobacco.

Following this mode the yellowing process is greatly shortened, requiring from four to eight hours less to yellow sufficiently, and also hastens the second stage of curing, fixing the color.

It is well to state that there is so great a difference in the character of tobacco grown in different localities that no rule can be given for the yellowing process applicable to all. The tobacco of middle and western North Carolina will yellow in much less time than that grown in middle Virginia. Then again, tobacco will bear higher temperature in the yellowing process during some years than in others. Notably the season of 1884, was so dry and tobacco held so little sap when ripe, that many commenced yellowing at 100 degrees, and had the leaf cured in fifty hours. But this is exceptional, and for general practice would spoil both color and tobacco.

The season, therefore, it must be borne in mind, greatly determines the amount of heat the tobacco will require to be yellowed and cured.

Some of the patented flues are so constructed that the heat is easily controlled, and the tobacco smoked or steamed, or both, as may be necessary in the yellowing stage. Some

tobacco will require neither to yellow right, while some other will dry up green or red without yellowing, if smoke or steam be not used to assist the yellowing process. Smoke or steam will facilitate the yellowing of thin poor tobacco, holding very little sap. Wetting the barn floor from time to time will assist in yellowing tobacco. Then there is an occasional barn of tobacco that defies all the known modes and appliances to yellow or cure bright.

But for all practical purposes, whenever the curer has mastered a knowledge of the effects of too much or too little heat, as evidenced in the color of the tobacco, clearly described heretofore, he possesses a key to solve the difficult problem in the science of curing tobacco. By close observation this lesson may soon be learned and then success is easy.

After curing, as soon as the tobacco is sufficiently soft to move, you may run it up in the roof of the barn and crowd it close, or if the barn is needed for other curings, the tobacco may be carried to the storage barn or bulked down in any dry house on the premises. But be sure that nothing is bulked with green stalks or swelled stems, for if such are placed down in bulk it will be sure to heat and utterly ruin.

## THE SCIENCE OF CURING YELLOW TOBACCO.

The first step in explaining the process is to give in outline the chemical constituents of green tobacco.

Besides its inorganic (mineral) elements—lime, potash, soda, magnesia, alumina, ferric oxide, phosphorus, sulphur, chlorine, and silica—it contains the following organic substances: starch, glucose, albuminoids, resinous and fatty compounds and the vegetable acids, pectic, citric, malic, oxalic and acetic. And of the combinations of organic elements there are found in tobacco, nicotine, nicotianine, celluloid and chlorophyl.

## RIPENING OF TOBACCO.

After the plant has attained its full growth, the leaves cease to expand and "granulation, due to the distention of the individual cells of the leaf through accumulation of inter-cellular substance begins," which in North Carolina and Virginia usually takes place from five to six weeks after topping, hastened or retarded according to season, soil and time of planting. Then, if the weather is dry and favorable for a few days longer, the color changes rapidly from green to a

pale yellowish green, as the plants get ready for the knife. The main cause of the change in the color of the leaves is due to the chlorophyl—the coloring matter in leaves—being changed to xanthophyl.

## CHANGES IN TOBACCO INDUCED BY FLUE CURING.

The temperature of 90 to 100 degrees Fahr. continued for 30 to 36 hours under the tobacco, induces slight fermentation, expands the leaf cells and starts the sap to the surface, when evaporation commences in earnest. The vegetable acids, acting on the starch, glucose and albumenoids, produce at first slight fermentation—somewhat after the ripening of an apple or pear, and causes a change of color in the leaf, superinduced by the same reasons or agencies which induce change in the color of a ripening apple or pear.

In the chemical changes produced in the incipient curing stages—the yellowing of the leaves—sugar is formed, ammonia evolved and chlorophyl changed into xanthine. Now, if the temperature is raised slowly at this stage of the drying process, so as not to oxidise the organic properties in the leaf, the color is preserved till the leaf is dried. But a too rapidly advancing temperature causes oxidation and discoloring, or rather reddening of the leaf, sometimes to the extent of scalding—virtually cooking it. And so, if the heat is not properly advanced and adjusted and fermentation too long continued, the yellow color fades into brown. To so regulate the color by heat as to catch and fix it in the leaf while the sap is being expelled and the leaf dried, is the science of curing yellow tobacco.

What is termed “sweating” during the curing process, is the accumulation of sap, driven by the heat to the surface of the leaves more rapidly than the ventilation will enable the hot dry air to absorb. And whenever this condition occurs, the experienced curer knows it results from inadequate or imperfect ventilation. For, whenever the ventilation is properly adjusted, there will be no sweating—the current of warm or hot dry air induced by the draft will take up—absorb—the moisture thrown to the surface as fast as it is evolved.

“Sponging” is produced by oxidation caused by fermentation too long continued, and indicates the incipient stage of what is called “house-burn,” “pole-sweat” or “barn-rot.” Proper ventilation, as well as heat, is necessary to so dry the leaf, without sweating or sponging, as to catch and fix the



yellow color. • Tobacco cured with a slight green color, which disappears before it is sent to market, is the fashionable color for fancy stock.

## DON'T SPOIL TOBACCO AFTER IT IS CURED.

If the temperature is raised above 160 degrees—and for some tobacco above 150—much of the vegetable oil is expelled, and therefore the “life” of the tobacco killed and thereby seriously damaged in other respects—evolving and fixing in the leaves ammonia and acids which bite the tongue, and injure the flavor.

The unscientific planter may know nothing of the chemical constituents of tobacco or the rationale of the effects of heat in inducing a pale green color in the leaf, or why heat and evaporation properly adjusted prevent oxidizing and reddening thereof, or that induces sweating and sponging and wherefore; but every one who reads this short monograph will the better understand why the changes and metamorphoses do occur and the reasons therefor.

## ORDERING.

If, after the tobacco is cured, the weather remains dry and it fails to get soft readily, so that it can be moved, it may be brought in order in the following way: Place green bushes with the leaves on over the floor and sprinkle water over them copiously; if the tobacco is very dry and the atmosphere contains but little moisture, and if the weather is cool, a little fire kindled in the flues will assist in making the tobacco soft. Straw, wet or made so, will answer the same purpose. If the weather is damp, there will be no necessity to use either straw, brush or water. But when it is necessary to use any means to order tobacco, it is best to apply them in the afternoon, that the tobacco may be removed the next morning.

If the weather continues warm and damp or rainy, tobacco that remains hanging will be apt to change color, unless dried out by flues or charcoal. When this becomes necessary, build small fires at first, and raise the heat gradually.

## STRIPPING.

Tobacco should never be stripped from the stalks except in pliable order, and the leaves on every plant should be carefully assorted, and every grade tied up separately.

Usually there will be three grades of leaf, assorted with reference to color and size, and two of lugs. Of leaf tie six to eight leaves in a bundle, and of lugs eight to ten. As fast as you strip, either hang the "hands" on sticks—twenty-five to each stick and hang up or bulk down in two layers, the heads of hands or bundles facing outward. The latter mode is best, if you intend to sell in winter order *loose*, on the warehouse floors. If bulked down watch frequently to see that it does not heat. If the bulk becomes warm it must be broken up, aired and rebulked, or hung up if too soft. It is safer always to hang up as soon as stripped, unless you design to sell soon, and strike down in "safe-keeping order" in spring or summer. It is considered in "safe order" when the leaf is pliable, and the stem will crack half way down the tie.

### PACKING.

If you sell loose, deliver in large uniform piles—such will cost less, and your tobacco bring more in price. But to sell in a distant market, pack in tierces—half hogsheads make the best and cheapest—to weigh about four hundred pounds net, taking care not to press the tobacco so as to bruise it, or pack it too closely together. The best leaf is wanted for wrappers, and it must open easily when shaken in the hand. Pack one grade only in each tierce, uniform in color and length; but if it becomes necessary to put more than one grade in a tierce, place strips of paper or straw between to mark and separate them. Pack honestly, for honesty is always the best policy. The man who "nests" his tobacco will certainly go on the "Black List," and buyers have good memories.

If your tobacco is *fine, sound and nicely handled*, you will have the satisfaction of getting, at the least, a remunerating price for it, although poor and nondescript stock may be selling for less than the cost of production. The world outside of this country makes, as a rule, low grades plenty, and at a cost to raise much less than we can compass. We must plant less surface, fertilizer heavier, and cultivate and manage better, if we would get the best prices.

## RESUME.

The following is taken from a circular prepared for me by Major Ragland, and is the substance of his manual "boiled down."

The tobacco plant thrives best in a rich, warm, well-drained soil, and can be successfully grown from the equator to beyond the fiftieth parallel of latitude, showing a most wonderful adaptation to climate.

Beyond any other field crop grown, tobacco requires "high farming," *i. e.*, heavy manuring and thorough tillage; and no crop responds more readily or bountifully, when the right types are planted on soils adapted thereto, and the product properly cultivated, cured and handled.

*Soils adapted to Types.*—A deep, rich soil overlaying a red or dark brown subsoil, is best suited for the dark, rich export type. A gravelly or sandy soil, with a red or light-brown subsoil, is best adapted to the production of sweet fillers and stemming tobaccos. Alluvials and rich flats produce the best cigar stock. White burley is most successfully grown on a dark, rich limestone soil. For yellow wrappers, smokers and cutters, a gray, sandy or slaty top-soil with a yellowish porous subsoil is preferable. The land must be loamy dry and warm, rather than close, clammy and cold; and the finer and whiter the sand therein, the surer the indication of its thorough adaptation to the yellow type. The soil so greatly affects the character and quality of the products, that success is attainable only where the right selection of both soil and variety is made for each plot planted, and planters do well to heed this suggestion.

*Varieties Suited for the Several Types*—For dark, rich "shipping," nothing has been found superior to the following:—James River Blue Prior, Lacks or Beat-All and Medley Prior. For sweet fillers: Sweet Oronoko and Flanagan. For stemming: Long Leaf and Broad Leaf Gooch, Hester, Tuckahoe and Big Oronoko. For mahogany wrappers: Primus, Tuckahoe, Hobgood, Yellow Prior, Flanagan and Gold Leaf. For cutters: Hyco, White-stem Oronoko, Yellow Oronoko, Silky Prior and Granville Yellow. For yellow wrappers and fillers: Sterling, Primus, Granville Yellow, White-stem Oronoko, Tuckahoe, Hester, Long Leaf Gooch, Yellow Oronoko and Yellow Prior.

Trial will determine what variety is best for any locality as no one variety is best for all locations. To plant varieties unsuited to the type, or on soil unadapted thereto, is to invite failure every time.

The leading cigar varieties are: Connecticut and Pennsylvania Seed Leaf, Imported and American Grown Havana, General Grant, Bradley Broad Leaf and several Spanish Strains.

*Start Right.*—The planter should select and prepare land suited to the type he purposes to raise, and then sow seeds of varieties recommended herein for the types specified, in good time, on beds thoroughly prepared and fertilized—warm southern and southeastern slopes preferred—and cover the beds with thin canvas.

South of 37° north latitude seed may be sown from 15th of December to 10th of March—the month of January preferable. Further north, sow later. Sow at the rate of one ounce of seed to the 100 square yards, and firm the soil with the feet or lightly brush them in. Raking buries the seeds too deep for successful germination. If the seed beds are thoroughly manured and canvassed as directed, they will require but little further attention, and the plants be ready for transplanting soon after 1st of May. Plant no tobacco after 1st of July, but fill up the missing hills with field peas or other crop.

*Preparations, Manuring, Etc.*—To grow a paying crop of tobacco, the soil must be thoroughly prepared and put in fine tilth and be heavily manured. No soil is naturally so rich that the product is not materially increased and made finer and better by the application of manure. Both domestic and commercial manures are successfully used under tobacco. And experience has demonstrated that it is best to use them in conjunction—either together in compost which is best, or by applying the domestic manure broadcast and drilling the commercial material when preparing the land for planting.

The usual practice is, for the leaf types, to run the rows three feet three to four inches wide—to facilitate through cultivation—and set the plants in hills or drills two feet ten to three feet apart. White Burley and Cigar Tobacco is set closer.

*Cultivation.*—Commence cultivation as soon as the transplanted plants have taken root, which will be in from ten to fifteen days after setting out, and continue to stir the soil with plow and hoe every two weeks until the leaves begin to lap across the rows; after which the hand hoe alone must be used. Frequent cultivation, when the plant is young, tends to pro-

more rapid and vigorous growth, early development, and ripening, essential to the yield and quality of the product.

Any mode of cultivation which is frequent and thorough, and very similar for the cabbage crop, will suit tobacco. Different soils require different utensils and cultivation, and therefore the judgment of the planter must guide him, as no fixed rules can be successfully followed. The diversity of soils and the vicissitude of seasons preclude any fixed line of action.

*Pruning and Topping.*—So soon as the plants shall have attained sufficient size and the seed-button is discernible, prune off the small lower leaves of the dark export type to six inches up from the ground and pinch out the seed-bud, leaving eight to ten leaves on the plant, the number left varying according to the fertility of the soil. An average of nine leaves to the plant makes the richest and most saleable product.

For the yellow and other manufacturing types it is best not to prune, but to gather the lower leaves as they ripen and cure them for smokers.

White Burley and Cigar tobacco may be topped leaving ten to fifteen leaves to the plant.

*Worming and Suckering.*—The bud and horn worms must be carefully picked from the plants as they make their appearance, or they will inflict great damage to the crop. The former is most destructive early and before the plants are topped; the latter comes in two broods, the first in June, and if these are destroyed, the quantity in August and September, (their second appearance), will be greatly curtailed. Various modes for destroying worms and moth have been resorted to, but none so successfully as hand-picking and killing.

Suckers will sprout at the axils of leaf and stalk after the plants are topped, and these must be pulled off as fast as they attain the length of two and three inches. If permitted to grow longer they sap the juices of the plant and detract from the size and richness of the leaves.

*Cutting and Housing.*—Ripe tobacco of the commercial leaf type is known by the graining and thickening of the leaf and change of color—the leaf assuming a yellowish and sometimes mottled yellow and green appearance—and when the under surface of the leaf will crack open on pressure between the thumb and finger when folded over.

White Burley and cigar tobacco are harvested not so ripe as indicated for the leaf types.

Tobacco of the several types are hung in several ways: Some cut the plants by splitting them down the middle of the stalks and straddling them across laths; some spear the plants, using a spear-like instrument hollow at one end to fit the lath; others string the leaves, pulling them from the plants as they ripen and stringing them upon wired sticks or laths, while others use cotton twine in the place of wire.

*Modes of Curing.*—The dark export type is still mainly cured in log barns dried over open wood fires. But it is only a question of time when the flue, so indispensable for curing the yellow type, will be used for curing this type also. Creosote imparts no desirable qualities to any type, and the taste grows every year more and more in favor of unsmoked tobacco.

The sweet filler is partially dried by sun and air and afterward cured by flues.

The yellow wrapper and cutter type is cured entirely by the use of flues.

The cigar type and white Burley are cured mainly by air-drying.

To specify every detail of the several modes of curing the different types would extend this article greatly beyond the limits assigned, and we therefore reserve for a future publication information covering the latest and best practice for all the types.

The tobacco planter should bear in mind that no crop is more exacting than tobacco; that small crops receive timely and better attention, and are more profitable than large ones. No crop grown in the United States will pay more handsome returns than tobacco when properly grown and managed.

*Handling Product after Curing.*—Many fine crops are ruined after being cured by rough and careless handling in stripping, assorting, bulking and packing. Tobacco should never be handled except when in "order" or "case"—i. e., when the leaf is pliant and not too limp from excess of moisture.

All tobacco should be assorted as the leaves are stripped from the stalks or taken from the sticks, having reference to color, length and quality, tying all such together neatly into hands or bundles, placing eight to ten leaves of "lugs"—inferior, lower or ground leaves—and five to seven of leaf in each hand.

Tobacco is in safe order or condition for packing when the leaf is pliant and the stem dry and will crack half-way down from the large end. Packed in such condition, tobacco "sweats

sweet." If too moist, it will heat in bulk and spoil; if too dry, it is broken and shows rough and unsightly.

Use the compost made of *Powell's Prepared Chemicals* for Tobacco, or *Powells "Tip Top" Bone Fertilizer*, from 300 to 400 pounds to the acre, and you can reasonably expect a good crop.

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We have requested Major Ragland to furnish us his Descriptive List of Tobacco Seed for insertion in this Book, that applicants may know where to apply for the best varieties suited to all the types, and by reference to the foregoing pages may be enabled to select properly.

### TO TOBACCO PLANTERS.

To grow fine Tobacco of any type, the first thing requisite is good seed of some variety best adapted to the type sought to be produced. The bright varieties will not make rich, heavy, waxy goods, nor will the Dark varieties make fine yellow, silky goods. While Cigar leaf requires varieties specially adapted to stock suitable for cigars. You cannot be too careful in the selection of your seed, and it will pay you to procure them from reliable growers or dealers only. Poor seed are dear as a gift, while good seed for a large crop of tobacco cost very little, and yet one dollar properly expended at this point has saved hundreds of dollars in the increased value of the crop. Take no risk, but use only the best varieties which are essential in making a fine staple, which always sells at remunerating prices.

### TO SEEDMEN AND DEALERS.

There are varieties of Farm and Horticultural Seeds which grow to perfection only in localities most favorable to their normal development, and it behooves every dealer in seeds, solicitous to furnish the best, to grow or have grown for their trade these seeds where they come to the highest perfection.

The soils and climate of Virginia are peculiarly adapted to Tobacco of every type; and seed grown here, under improved methods, possess the highest vitality and finest native qualities. Many planters in other States send to Virginia for seed every year—Virginia seed giving better results than seed procured elsewhere.

Tobacco Seed grown and saved like buck-wheat, *i. e.*, every panicle on the stalk allowed to remain and bear capsules, will turn out double the quantity in yield, over seed plants trimmed of all their lower thyrsi and only three or four at most of the top ones allowed to bear seed. The pruning process, however, is the proper mode, for by it the seed capsules are larger—the whole force of the plant is directed to the formation of fewer capsules with seed of higher vitality, which may be more surely relied upon to transmit their peculiar good qualities. Seed thus grown are more reliable in every essential quality, and should never be classed with seed grown after the old method.

The long experience of the proprietor of *Hyco Seed Farm*—the *Pioneer Tobacco-Seed Grower*—using new and improved implements and methods, some of them of his own invention, enables him to compete in price with any who raise tobacco seed for market, while in the *quality* of his seeds he challenges competition. No one can grow such seeds except by his method—the only proper one—and when thus grown, no one has ever duplicated his prices:

He, therefore, claims to sell the best and at the lowest price.

Hixburg, Appomattox Co., Va.

Dear Sir:—Yours wishing to know how Powell's Chemicals acted for me, is to hand and noted. I used five tons upon my tobacco crop of sixty thousand hills. I have heretofore used from three to five tons of high priced Guanos, and I never made a better crop any year than I have made this year with the chemicals. I fallowed a good deal of land for wheat and used upon that six tons of Chemicals. My wheat crop is said to be looking better than any other in the neighborhood. I am much pleased with the Chemicals and will continue to use them as long as they will do so well for me.

Yours truly, WM. D. HIX.

Cumberland Co., Va.

Dear Sir:—I bought enough of Powell's Prepared Chemicals last Spring for Tobacco, to make one ton of fertilizer. I used it side by side with a fertilizer that cost me fifty dollars per ton, putting the same quantity to the acre of each. I could see no difference in the tobacco. I am very much pleased with your Chemicals.

Yours, &c., R. V. LANCASTER.

Cunningham Store, Person Co., N. C.

Dear Sir:—I used your Chemicals last year on tobacco and I never had better result from any Peruvian guano or any other fertilizers in my life and I expect to use it again.

Yours, RO. B. BASS.



# PIONEER TOBACCO-SEED FARM,

THE BEST VARIETIES

For Every Type of Tobacco.



PEDIGREE SEEDS, improved by continuous selection, and grown on the crown shoots only, warranted true to name and of the highest vitality. It is essential to select a variety suited to the type desired to be produced, and to plant only one variety in the same field, to insure uniformity in the crop.

We offer none but seeds of our own production.

None better can be found than the following:

STERLING.—The newest and brightest of the yellow type; and being the earliest to ripen, is *surest* in localities liable to early frosts.

PRIMUS.—Leaves large, fibres fine and texture silky. Yields big crops of extra fine quality. Suited for manufacturing or cigars. Grows rapidly and may be relied upon to ripen with  
STERLING. New and scarce.

SPOTTED PRIOR.—A new favorite; early fine and adapted to several types. Mild in flavor and makes fine Brights or mild colory fillers.

LONG LEAF GOOCH.—Leaf larger and finer than the Round Leaf Gooch. One of the very best for the manufacturing types.

LACKS.—Broad leaf, tough fine fibre. On gray soils cures bright and elastic; on dark soils, rich and gummy. Known as Jesup or Beat-All in some localities. Good and reliable.

**GRANVILLE COUNTY YELLOW.**—A superb variety, and a favorite with many planters who average from 20 to 50 dollars per hundred pounds,—select lots selling for several dollars per pound. Among the earliest to mature and ripen.

**TUCKAHOE.**—A first-class variety in every respect. New and preferable to most of the older varieties for possessing more body. Leaf long and extra fine—the perfection of a wrapper.

**WHITE STEM ORONOKO.**—From the Yellow Oronoko, which it resembles, and a most excellent variety. Greatly preferred in some localities where the finest types are grown.

**HYCO.**—A new variety, and the easiest of all cured yellow. Fine texture, good flavor and sells well. A Hybrid Oronoko and Gourd Leaf. A beautiful and desirable variety.

**HESTER.**—A new variety, originated in Granville county, N. C., and has no superior for the yellow type, and makes fine cigar stock. It has size, shape, texture and color, and ripens early. It recommends itself greatly in this, that it has greater adaptability over a wider range of soils and latitude than any other of the yellow varieties, and may, on this score, be considered the surest.

**YELLOW ORONOKO.**—A reliable old yellow variety, grown for more than fifty years, and improved with reference to the production of yellow stock.

**GOOCH.**—A new variety of a great excellence. Resembles the Yellow Oronoko, but has a larger leaf; a splendid manufacturing sort.

**YELLOW PRIOR.**—Preferred by many for brights, and succeeds where other yellow sorts fail. The West is giving it preference.

**SWEET ORONOKO.**—Used for first-class plug fillers, and makes, when sun-cured, the best Natural Chewing Leaf. A favorite for the "Homespun" wherever known. Known as Little Oronoko in some localities. Makes an Eastern Filler unsurpassed.

**FLANAGAN.**—Originated in Henry county, Va., and is greatly used for making sweet fillers and mahogany wrappers. It is a variety of the Old Sweet Oronoko, with broader leaves and finer texture.

**BIG ORONOKO.**—An old variety and a good, tried one. Has a large, broad, finely-shaped leaf, and for strips and dark wrappers has no equal.

**BLUE PRIOR.**—The genuine James River favorite. Rich shipper, superior to the Kentucky Blue Prior.

**MEDLEY PRIOR.**—Originated in Halifax county, Va., about seventy years ago, and is a general favorite with planters who

grow the English and Continental grades. When properly grown and cured, it commands the highest price for a "shipper."

**BRADLEY BROAD LEAF.**—A popular variety for several types—export, manufacturing and cigars. A good, reliable variety.

**CONNECTICUT SEED LEAF.**—The largest, finest and best of this indispensable kind. Every seed-stock carefully selected.

**PENNSYLVANIA SEED LEAF.**—Gessner and other superior kinds. The best grown in the famous Lancaster county district.

**GENERAL GRANT.**—One of the finest, earliest and most popular kinds for cigars. Grows more in demand every year.

**PERSIAN ROSE.**—Finer than the Muscatel, and may be relied upon to make the finest cigar stock. A very promising variety. 30 cents per ounce.

**HARBY.**—A Turkish variety which stands heat and drought beyond all others, and may be topped to twenty-five leaves or more. Superior to Latakia, and possesses a very agreeable odor and flavor. 30 cents per ounce.

**BRAZILIAN-AMERICAN.**—The finest Brazilian strain acclimated. Makes excellent cigars and delightful, aromatic pipe-smoking tobacco. 30 cents per ounce.

**HAVANA.**—Grown from *imported* seed—Vuelto de Abajo—*direct*. Better than imported seed for American Planters. 30 cents per ounce.

**BIG HAVANA.**—A Hybrid Havana or Cuban seed-leaf. A heavy cropper, of fine texture, delightful flavor and the earliest cigar variety to mature and ripen. Will make two crops from one planting in the South, whilst its earliness makes it most desirable for high latitudes. The best Americanized Havana

## WE DEFY COMPETITION

In the Selection, Quality and Price of our Seeds.

Retail price, by mail, 25 cents per ounce, except where otherwise stated; five ounces of any one variety for \$1. By the pound, including not more than two varieties, \$2. No half ounce packets sold. postage stamps taken for fractional parts of a dollar.

Remittances may be made by P. O. Order, Registered Letter, Express or Bank Check---Eastern Exchange preferred. Money Order and Express Office, South Boston, Va.

☞ Wholesale rates to Warehousemen and the Trade on application.

R. L. RAGLAND, .

Hyco, Halifax County, Va.

Refers, by permission, to

PLANTERS and MERCHANTS BANK and SOUTH BOSTON BANK, both of South Boston, Va., and generally to the TOBACCO MEN and PLANTERS of Virginia and North Carolina.

☞ T. W. WOOD & SONS, Seedsmen, Richmond, Va., are prepared to furnish Ragland's Seeds, Wholesale and Retail, at the lowest prices.

Only a few testimonials are given herein for want of space---my TIP TOP BONE FERTILIZER and the POWELL'S PREPARED CHEMICALS for Tobacco are so well known, they really are not necessary.

Gary's Store, Buchanan Co, Va.

I used one ton of Powell's Prepared Chemicals upon my tobacco crop last spring. I made a fine crop of tobacco; in fact, was so much pleased with its action that I used five tons this fall on my wheat.

JAMES H. FORBES.

C. W. Hazen, Catlett's Station, Va., says: I have been using fertilizers for 25 years; have experimented with many different kinds, and never have used any that has given me better results than Powell's Prepared Chemicals.

Mr. P. Strickler, Timberville, Va., says: I have used Powell's Prepared Chemicals largely, and they have done as well for me as any of the high-priced fertilizers I have heretofore used.

HENRY F. CLARK, Esq., Ringgold, Va., says:—I used Powell's Tip Top Bone Fertilizer for tobacco, and made good crops. I was well pleased with it and think it the best fertilizer for tobacco I ever used. I expect to continue to use it.

JOHN C. CHANEY, Esq., Laurel Grove, Va., says:—I have been using Powell's Tip Top Bone Fertilizer since 1882. I use for tobacco 400 lbs. to the acre, and give the following results as my experience. In the year 1882, my crop averaged \$24.80 per cwt. In 1883, it averaged \$25.55, and the crop, which I gave just finished curing, will, I think average at least \$30.00 per cwt., it being the finest crop I have ever raised. The "Tip Top" is as good as any guano I have ever used, without regard to price, and I have used almost all kinds since I have been farming. I can recommend it to my neighbors.

Hyco, Va., Nov. 15th, 1888.

MR. W. S. POWELL, Baltimore, Md.

Dear Sir:—Your "Tip Top" Fertilizer was used for tobacco this year—350 to the acre—on an old field, that produced last year less than seven bushels corn per acre of poor quality, being largely nubbins. The tobacco grew off well in spite of a drought of eight weeks duration; leaf fairly good size, of fine texture and yellowed on the hill in defiance of continued rains during September and October, and cured mahogany color of good quality.

It is notorious, that the past season was the most unfavorable for tobacco that many planters ever experienced, and it is deservedly high praise to the Tip Top, to report that its action and results proved decidedly more favorable and satisfactory than were obtained from any other of several standard brands of Fertilizers used in competition therewith—many of them higher priced and all of them having the advantage of being used on fresher and better soil.

I've never used a Tobacco Fertilizer on old land with better or more satisfactory results than were realized from Tip Top this year, considering the season, and will not only use it again, but confidently recommend it to others.

Yours truly, R. L. RAGLAND.

We concur in what Major Ragland says of the Tip Top, and believe it to be a most excellent fertilizer for Tobacco. It certainly acted well this year on old land under very unfavorable conditions.

E. F. COLE, Manager for Major R. L. Ragland.

J. P. TOFTIS, Tenant of Major R. L. Ragland.

Brook Neal, Campbell Co., Va., Nov. 8th, 1888.

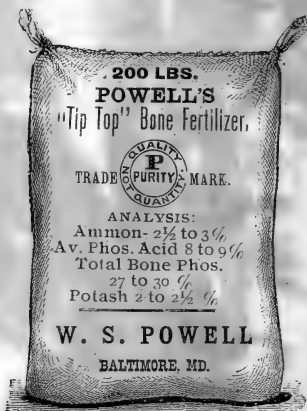
\* \* "I am glad to say that the farmers are highly pleased with your Tip Top Bone Fertilizer, used last season on tobacco. They say it has the right name and is TIP TOP, and that they prefer it to any Fertilizer they ever used."

Milton, Ky., Nov. 6th.

We are all pleased with the Tobacco crops grown with your Fertilizer. My son and myself used  $1\frac{3}{4}$  tons on six acres com-com land, and have an extra crop for any land or year; have been raising tobacco for 20 years; my last crop raised with your Fertilizer was the best in two counties—so the buyers say.

L. M. WOOD.

POWELL'S  
 "TIP TOP"  
 BONE FERTILIZER.



POWELL'S TIP TOP BONE FERTILIZER is unquestionably the best Fertilizer for all crops I know of,—it has been thoroughly tried for the past twelve years on nearly every kind of crop and on all styles of land ; and so far, I have not heard a complaint of it. In its preparation, it has been my aim to combine all the essential elements of plant life in such proportions as to make them readily assimilate to the growing plant; it is strong and quick-acting. For Tobacco—in the tobacco sections of Virginia, North Carolina and Kentucky—it is a great favorite, and equally so in the grain sections of the Middle States. I aim to have it always dry and in good condition. No farmer can go wrong in using Tip Top. Where ordinary fertilizers have given satisfaction with an application of 100 pounds to the acre, I feel safe in recommending a smaller quantity of Tip Top.

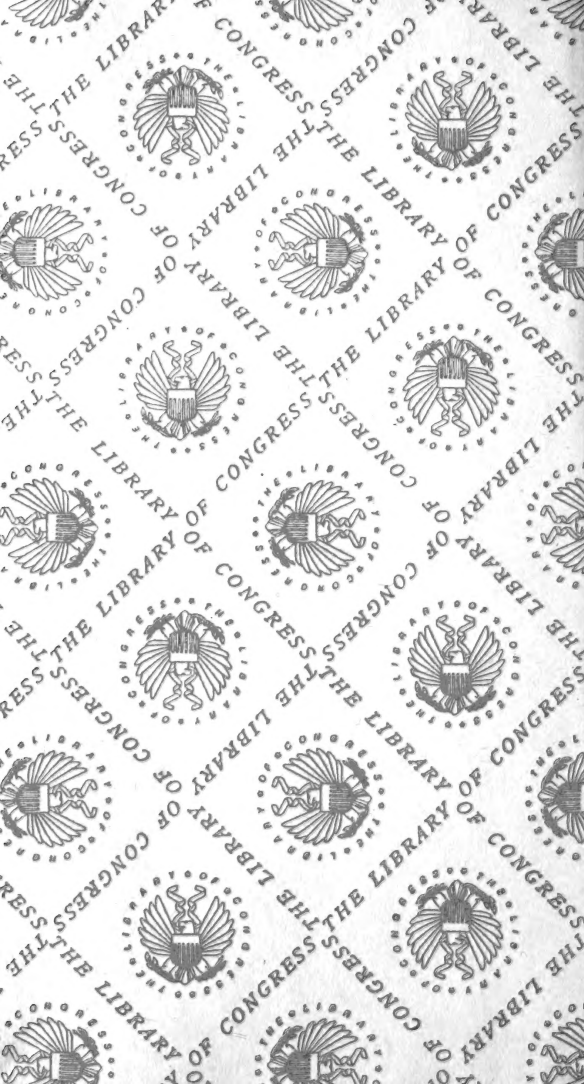
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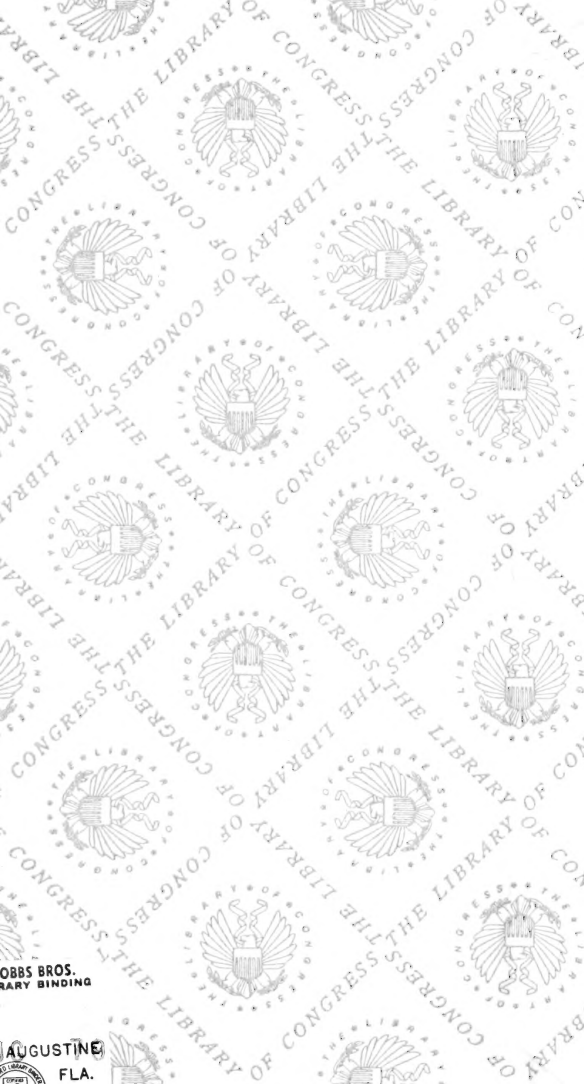












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