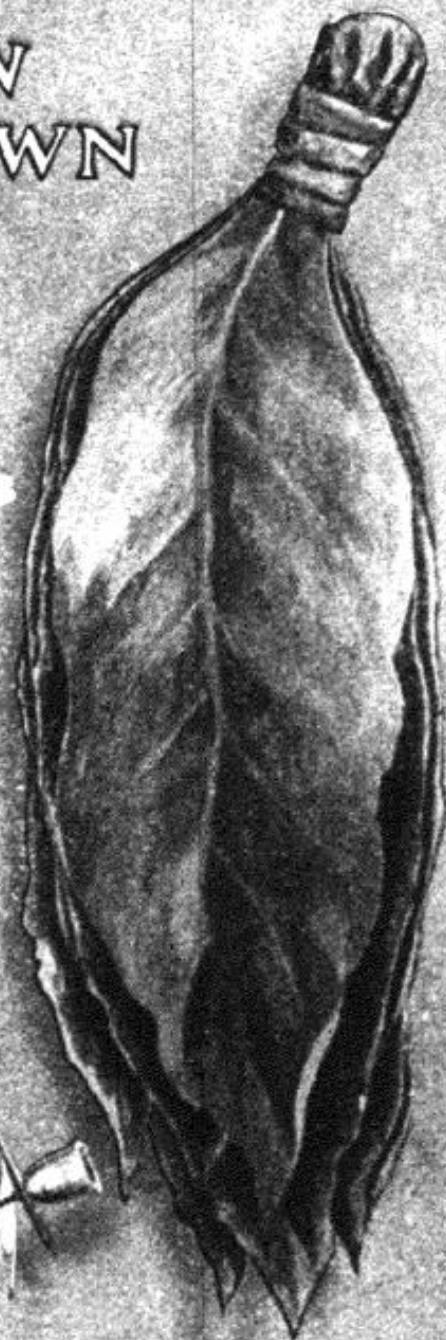


TOBACCO

NORTHERN
AND
WESTERN GROWN



Published by
VIRGINIA-CAROLINA CHEMICAL Co.
RICHMOND, VIRGINIA

High Grades of Fertilizer

Recommended by

The Soil Improvement Committee of the
National Fertilizer Association.

Crop	Sandy Soil APA-A-P	Loam Soil APA-A-P
Alfalfa, seeded down	10-2-4	12-2-2
Alfalfa, top dressing	12-0-4	12-0-2
Asparagus	7-5-2	7-5-2
Apples, sod orchard	7-5-2	8-6-0
Apples, tilled orchard	10-3-4	10-3-2
Barley	10-2-4	12-2-2
Buckwheat	10-2-4	12-2-2
Brussels Sprouts	10-3-4	10-3-2
Beets	10-3-4	10-3-2
Beans, garden	10-3-4	10-2-4
Beans, field	10-2-4	12-2-2
Blackberries	12-2-2	12-2-2
Corn, for grain	10-2-4	12-2-2
Corn, for silage	10-2-4	12-2-2
Clover, seeding	10-2-4	12-2-2
Clover, top dressing	12-0-4	12-0-2
Cabbage	10-3-4	10-3-2
Cauliflower	10-3-4	10-3-2
Carrots	10-3-4	10-3-2
Cucumbers	10-3-4	10-3-2
Celery	10-3-4	10-3-2
Grass, seeding	10-2-4	12-2-2
Lettuce	10-3-4	10-3-2
Millet	10-2-4	12-2-2
Meadow, top dressing	7-5-2	8-6-0
Mangels	10-3-4	10-3-2
Melons	10-3-4	10-3-2
Oats	10-2-4	12-2-2
Onions	8-2-8	8-2-8
Permanent Pastures, top dressing	12-0-4	12-0-2
Parsnips	10-3-4	10-3-2
Potatoes, late	10-3-4	10-3-2
Peas, field	10-2-4	12-2-2
Peas, garden	10-3-4	10-2-4
Peaches	7-5-2	8-6-0
Rye, fall seeding	10-2-4	12-2-2
Rye, spring top dressing	7-5-2	8-6-0
Rutabagas	10-3-4	10-3-2
Raspberries	12-2-2	12-2-2
Sweet Corn	10-3-4	10-3-2
Sugar Beets	10-3-4	10-3-2
Spinach	7-5-2	7-5-2
Strawberries, spring setting	10-3-4	10-3-2
Strawberries, top dressing	7-5-2	8-6-0
Squash	10-3-4	10-3-2
Timothy, top dressing	7-5-2	8-6-0
Turnips	10-3-4	10-3-2
Tomatoes, cannery	10-2-4	10-2-4
Wheat, fall seeding	10-2-4	12-2-2
Wheat, spring top dressing	7-5-2	8-6-0

Tobacco

NORTHERN AND WESTERN GROWN

Published by
CROP BOOK DEPARTMENT



ILLUSTRATIONS
FROM PHOTOGRAPHS OF V-C CROPS

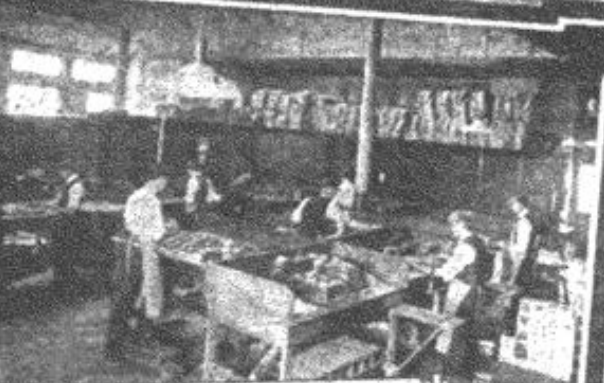
V - C SALES OFFICES

Richmond, Va.
Norfolk, Va.
Alexandria, Va.
Durham, N. C.
Winston-Salem, N. C.
Baltimore, Md.

Charleston, S. C.
Columbia, S. C.
Jacksonville, Fla.
Cincinnati, Ohio.
Shreveport, La.
New York City.

Atlanta, Ga.
Savannah, Ga.
Athens, Ga.
Memphis, Tenn.
Montgomery, Ala.
Mobile, Ala.

Main Factory Room, Making
The "Tom Palmer" Cigar.



Assorting, Inspecting and Packing.



Mixing the Blend.



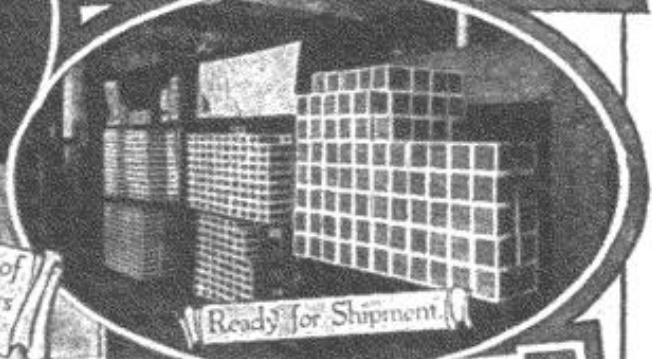
The Finished Article.



A stock room where by constant attention
to temperature, humidity and ventilation,
the tobacco is kept in perfect condition.



Chicago Office and Factory of
Wengler & Mandell, Inc. Makers
of The Tom Palmer Cigar.



Ready for Shipment.



Selecting and Stripping Wrappers.



Blending the Fillers of Clear Havana.

An inside view of one of the factories that make your tobacco into the finished product CIGARS.

Tobacco

Northern and Western Grown

Over a Billion Pounds a Year:

The production of all types of Tobacco in the 24 Tobacco growing states in 1917 was 1,196,451,000 pounds on 1,446,600 acres. The following table shows Tobacco acreage and production in these Tobacco growing states according to U. S. Department of Agriculture, December 30, 1917, tabulated in order of production.

Acreege and Production in 24 Tobacco Growing States

State	Acres	Pounds Production
Kentucky.....	474,000	426,600,000
North Carolina.....	325,000	204,750,000
Virginia.....	185,000	129,500,000
Ohio.....	103,200	99,072,000
Tennessee.....	101,000	81,810,000
Pennsylvania.....	41,500	58,100,000
South Carolina.....	72,000	51,120,000
Wisconsin.....	48,300	45,885,000
Connecticut.....	21,100	29,540,000
Maryland.....	28,600	22,594,000
Indiana.....	14,800	14,060,000
Massachusetts.....	8,400	11,833,000
West Virginia.....	11,300	9,040,000
Florida.....	3,100	3,410,000
New York.....	2,500	3,125,000
Missouri.....	3,000	2,820,000
Georgia.....	1,600	1,600,000
Illinois.....	700	560,000
Arkansas.....	300	210,000
Louisiana.....	600	210,000
New Hampshire.....	100	167,000
Vermont.....	100	165,000
Alabama.....	200	146,000
Texas.....	200	134,000
Total.....	1,446,600	1,196,451,000

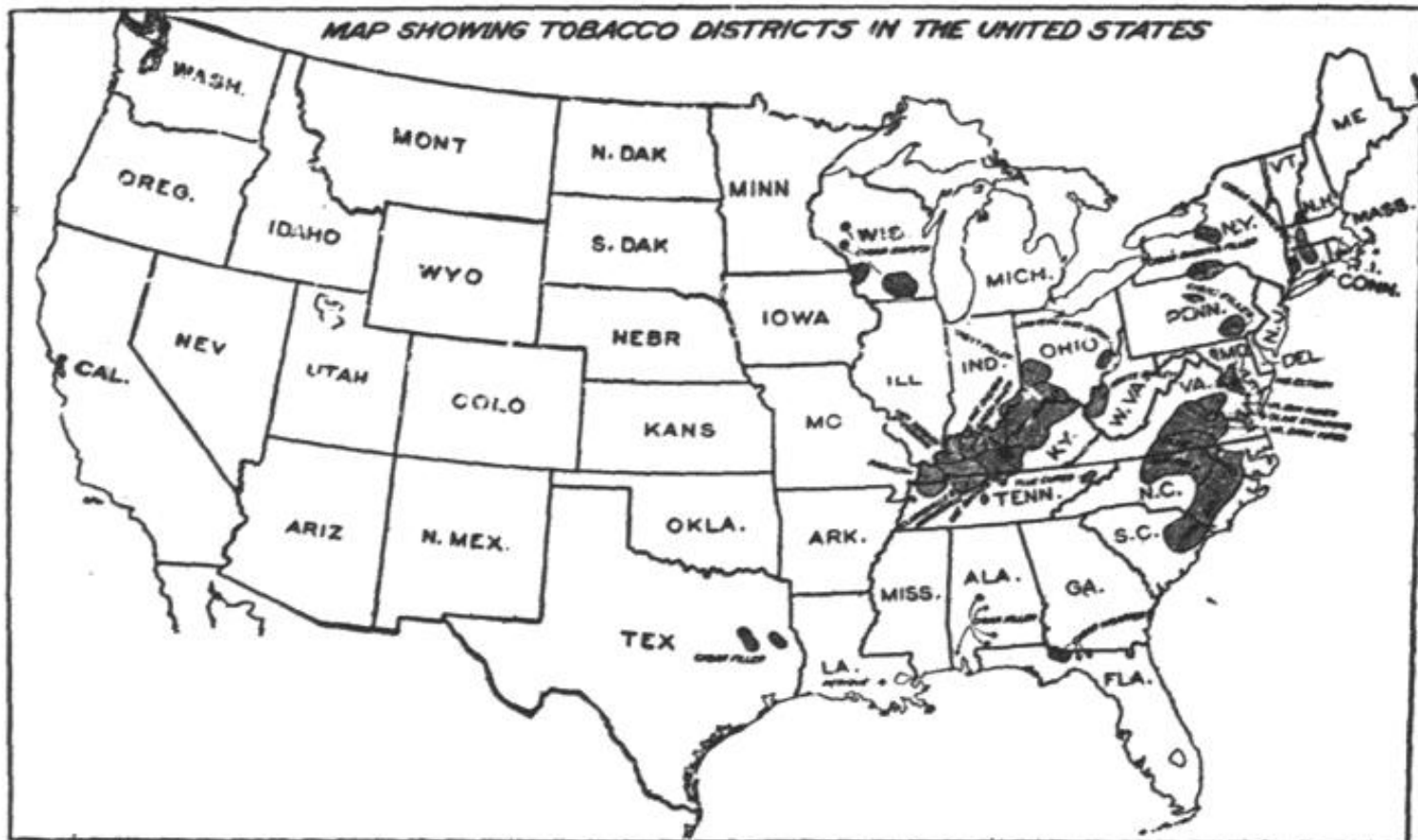
Yields Per Acre:

In no section of these 1,446,600 Tobacco growing acres is the yield per acre so high as in the New England States. Hew Hampshire in 1917 had a yield of 1,670 pounds to the acre. Vermont 1,650 per acre, and Massachusetts and Connecticut both over 1,400 each per acre—whereas Ohio only grew 960 pounds per acre on its 103,200 acres of Tobacco. Had Ohio an average yield per acre the same as New Hampshire, 1,670 pounds, it would have produced 173,344,000 pounds instead of only 99,072,000 pounds, or an increase of 73,272,000 pounds. This increase at only 10 cents a pound would have netted the Ohio growers \$7,327,200 more than they received for their Tobacco crop last year.

Leading States in Value Per Acre:

Florida leads all states with a value per acre of \$627.00 on her 3,100 acres. Georgia is second with \$570.00 to her credit, and the New England States are third, with Massachusetts and Connecticut having a value per acre of \$541.06 and \$537.60 respectively. In 1915 and 1916 Connecticut lead all states in value per acre with \$440.10 in 1916 and \$229.50 for 1915.

MAP SHOWING TOBACCO DISTRICTS IN THE UNITED STATES



United States Department of AGRICULTURE.

A Few Facts of Interest to The Growers and Consumers of Tobacco

300 Years Ago and To-day:

If the Tobacco growers of Kentucky had received the same price for their product in 1917 that John Rolfe received for his Tobacco in 1618, they would have received the enormous total of over 233 millions of dollars, and the entire crop for the United States would have amounted to over 655 millions of dollars. John Rolfe was growing Tobacco in the streets of Jamestown as early as 1612, and in 1618 the first official statement of Tobacco exports is recorded, which amounted to 20,000 pounds at a valuation of 54½ cents a pound.

To what extent the Tobacco industry has grown, since this first exportation may be gathered from the fact that the manufacturers of Tobacco products in this country paid to the U. S. Government in 1916 the sum of \$88,063,947.51 for internal revenue taxes, an increase of \$8,106,573.97 over the previous year.



Gathering the Harvest at Ed Squire's Farm, Glastonbury, R. F. D., Conn. 3,000 Lbs. V.C. Fertilizer Used. Estimated Yield, 1,600 Lbs.



On the Bancroft Farm, Glastonbury, R. F. D., Conn. 2,000 Lbs. of V.C. Fertilizer Per Acre Used with a Light Coat of Manure. Tobacco Yield About 1,650 Lbs. Per Acre.



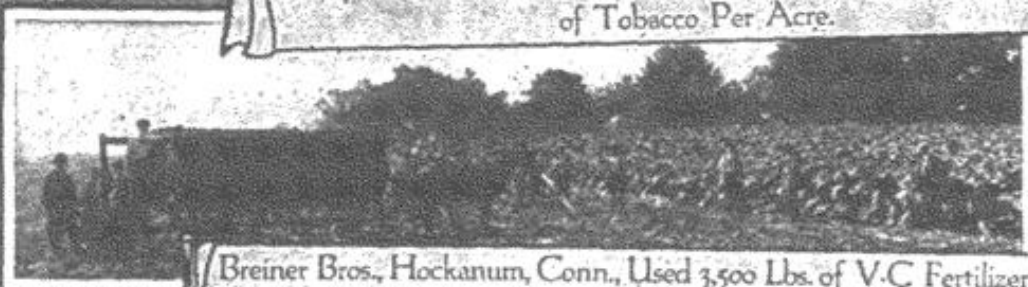
On the Wm. J. Stevins Estate, Hockanum, Conn. 3,500 Lbs. of V.C. Fertilizer Per Acre Used. Estimated Yield 1,500 Lbs. Per Acre.



Mulcahy Bros., Glastonbury, R. F. D., Conn. Used About 3,000 Lbs. of V.C. Fertilizer Per Acre. Result, 1,650 Lbs. of Tobacco Per Acre.



Wm. Mulcahy, Glastonbury, R. F. D., Conn., Used About 3,000 Lbs. of V.C. Fertilizer on His Field with a Return of 1,650 Lbs. of Tobacco Per Acre.



Breiner Bros., Hockanum, Conn., Used 3,500 Lbs. of V.C. Fertilizer Per Acre on This Field. Estimated Returns 1,550 Lbs. Tobacco Per Acre.

Kentucky leads all States in the production of raw leaf Tobacco, Pennsylvania leads all States in the manufacture of cigars; New York in the manufacture of cigarettes, North Carolina in manufacture of smoking Tobacco, and Missouri in the manufacture of chewing Tobacco. That we are great smokers in this country is evidenced by the fact that we smoked about 25 billions of cigars and cigarettes last year, and about a quarter of a billion pounds of smoking Tobacco.

As late as July 3, 1917, the U. S. Department of Agriculture reported that the total production in 1915 of

Smoking Tobacco was.....	234,937,827 pounds
Plug Tobacco was.....	150,658,608 pounds
Snuff Tobacco was.....	31,898,407 pounds
Twist Tobacco was.....	14,829,476 pounds
Fine Cut Tobacco was.....	10,045,001 pounds

Total.....442,369,219 pounds

One single company alone sold \$36,000,000 worth of cigars, cigarettes, etc., for the twelve months ending June 30, 1917, in the United States. In the month of May this same company sold over 3,000,000,000 cigarettes.

The aborigines of America grew Tobacco long before the event of the White Man. The French explorers, Marquette and LaSalle, found it in cultivation and use by the Indians along the Mississippi and Ohio Rivers and tributaries as early as 1669 and 1673. Nearly 100 years later Capt. Christopher Gist came down the Ohio River in 1750 and found Tobacco being grown by a tribe of Indians at Shawanestown, now Portsmouth, Ohio.

Ohio Makes Great Strides:

In 1917 the Ohio-Miami Valley produced the greatest amount of Cigar Type Tobacco in the United States, i. e., 61,692,000 pounds; Pennsylvania 58,100,000 pounds was second, and Wisconsin third with 45,885,000 pounds.

Great strides have been made in some of the Ohio Tobacco growing sections, for instance, in the county of Gallia only 8,010 pounds of Tobacco were grown in 1869, which increased to 2,805,439 pounds in 1909.

Adams County, in the Southern or Burley Districts produced only 43,060 pounds of Tobacco in 1859, which in 1909 increased to 8,121,165.

Darke County produced 167,989 pounds of Tobacco in 1889, but in 1909 the Tobacco growers of Darke County produced 16,618,500 pounds of fine cigar filler Tobacco from only 19,129 acres.

Montgomery County growers produced 15,291,779 pounds on 27,253 acres.

Miami Valley alone produced 54,314,620 pounds of Tobacco out of a total production for the State of Ohio of 88,603,308 pounds, in 1909.

Heavy Fertilizing Pays Big Profits:

The New England states lead the 13 principal Tobacco growing states in the value per acre of their Tobacco crops. Massachusetts leads with a value per acre of \$541.06, basis December 1-17 price; Connecticut is a close second with \$537.60 value per acre. On pages 11, 16, 18, 23, 28, 29, 32, 33, 38 and 42 will be found illustrations of some typical New England Tobacco fields on which V-C was liberally applied. The New England growers realize the advisability of feeding their crops bountifully, and their yields are evidence of the fact that heavy fertilizing pays big profits.

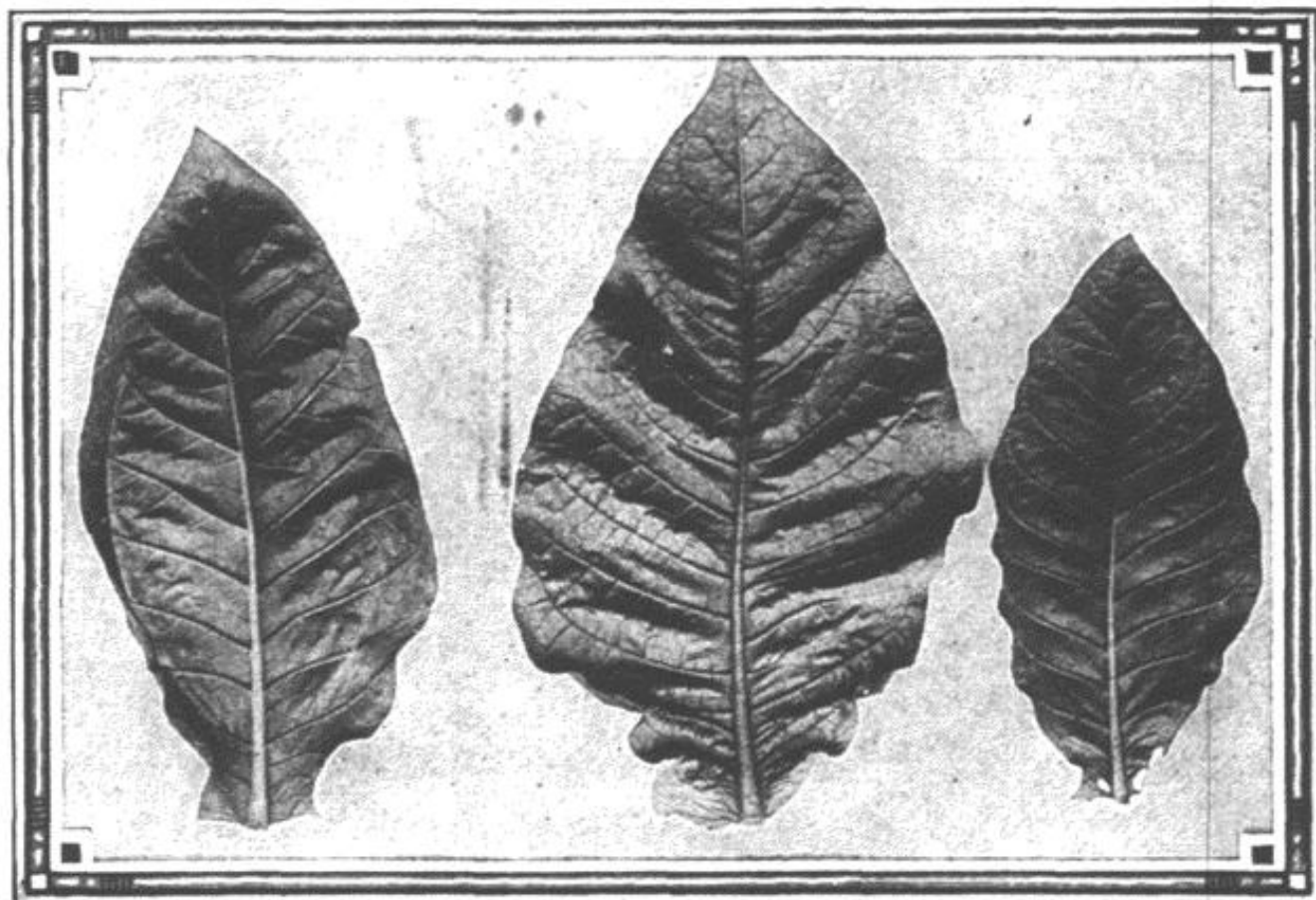
Big Burley Production:

White Burley Tobacco in Kentucky amounts to an output of 170 million pounds. The total production of Burley Tobacco in the U. S. in 1914 was 224,644,000 lbs.; next to Kentucky the other states producing Burley are in order of their importance: Ohio, West Virginia, Indiana, and Missouri. The receipts of Burley Tobacco on the Cincinnati market had grown from 49,257 hogsheads in 1882 to 63,910 in 1902, representing shipments from the Burley Tobacco districts in Kentucky, Ohio, Indiana, Illinois, Missouri, West Virginia, Tennessee, etc.

* * * * *

Development of Tobacco Culture

From the small beginnings in the commercial cultivation of Tobacco by the early Virginians of the Jamestown settlement, as has already been pointed out, it is a magnificent development to the multiplicity of types and sub-types now grown extensively in the majority of the States east of the Mississippi River from Florida to Wisconsin and from Louisiana and even Texas to New York and New England.



Under leaf surfaces, and shapes of tobacco leaves; on right, leaf of Zimmer Spanish; in middle, leaf of Ohio or Washington Seedleaf; and at left, leaf of Pennsylvania Seedleaf.

As we have seen the production of Tobacco in the United States now amounts to over 1,000,000,000 pounds per annum, which is valued at \$100,000,000 to \$150,000,000. Of this, some 400,000,000 pounds are annually exported consisting almost entirely of what is known as the heavy or export

types produced principally in Kentucky, Tennessee, the Carolinas, Virginia and Maryland. We also import some 50,000,000 to 60,000,000 pounds principally of the cigar types of leaf produced in Cuba, Porto Rico, the Dutch East Indies, and the Philippines, including some 10,000,000 pounds from Turkey and vicinity.

Difference in Type

As Tobacco culture, in its development, extended to new soil types in different sections there came about marked differences in quality and style of leaf produced. Herein we see the origin of the diversity of types now produced in the United States.

Some types are dark in color, nearly black in some cases, coarse in fibre and very strong and high in nicotine. From such a type it is a striking and almost unbelievable contrast to the delicate thin leaf produced under cheese cloth shade in the Connecticut Valley in New England and in certain parts of Florida and Georgia. Then there are the beautiful bright, orange and lemon yellow types of Virginia and the Carolinas, also the peculiar White Burley of central Kentucky, southern Ohio and West Virginia, the somewhat similar Maryland export type, the spangled Tobacco of eastern Ohio, and the jet black strongly aromatic Perique of Louisiana.

One of the most important differentiations in type is that of the Northern Cigar Types produced in the Connecticut Valley in New England, New York State, Pennsylvania, Ohio and Wisconsin. The annual production of these cigar types is upwards of 200,000,000 pounds or about 20 per cent. of the entire production of Tobacco in the United States. In the Tobacco trade these cigar types are sharply differentiated from the so called manufacturing and export types used in the manufacture of smoking Tobacco, chewing Tobacco, snuff and cigarettes, and exported in large quantities.

Modern Tobacco Culture

It is easy to understand, with all this diversity in types of Tobacco produced in the different districts, that there must also be very striking differences in methods of production. Soils vary strikingly, as do also methods of fertilization, cultivation, curing, handling and marketing.

It is the purpose of this little book to assist Tobacco growers by furnishing reliable up-to-date information as to the methods which have been found most profitable in the various Tobacco growing districts.

Tobacco A Very Profitable Crop to Grow:

The great variation in type and quality of Tobacco; the diversity of soil in the Tobacco growing section, some suitable and some unsuitable; the importance of proper fertilization; and the skill required for proper curing and handling, all these conspire to make Tobacco culture a complex business offering large profits to the grower who is really master of his business.

Tobacco is a sensitive plant, and its yield, composition, size, color, superficial quality, and market value are greatly influenced by soil, climate, weather, fertilization and treatment given from the selection of the seed to placing on the market. It may safely be said that there is no other important farm crop the value and profitableness of which is so dependent upon the knowledge, care, skill, good judgment and experience of the grower.



A seed plant of Hybrid 201. A new type which seems to promise a good yield of fine appearing tobacco. Bulletin 239, Ohio Experiment Station.



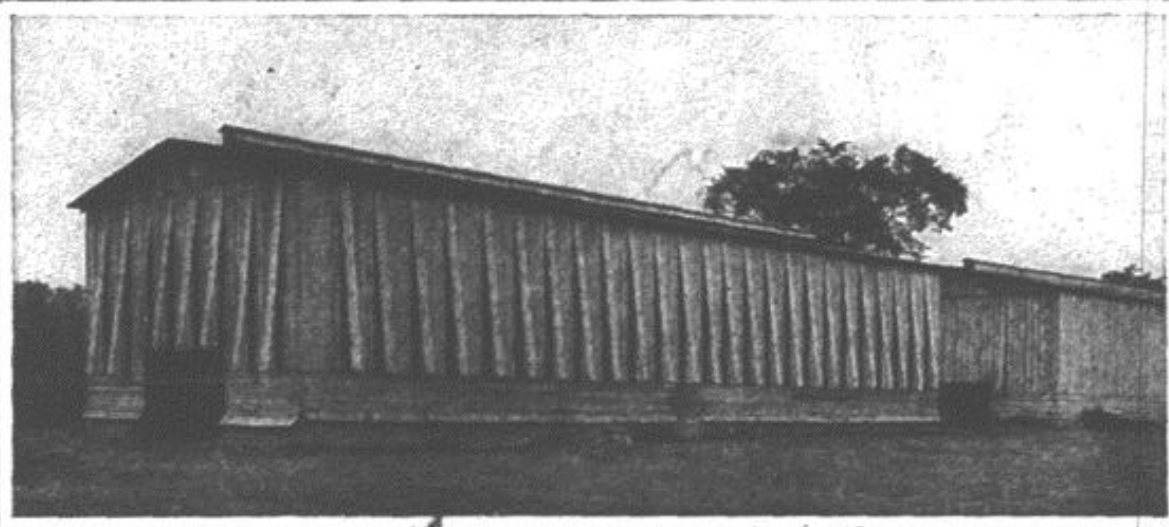
Tobacco on the Farm of W. S. Young, Grown by Price & Son at Horse Cave, Ky., who say "We have Used V-C 2-10-10 Fertilizer throughout this year and hope we can always get the same kind."



A Tobacco Field Near Lexington, Ky.



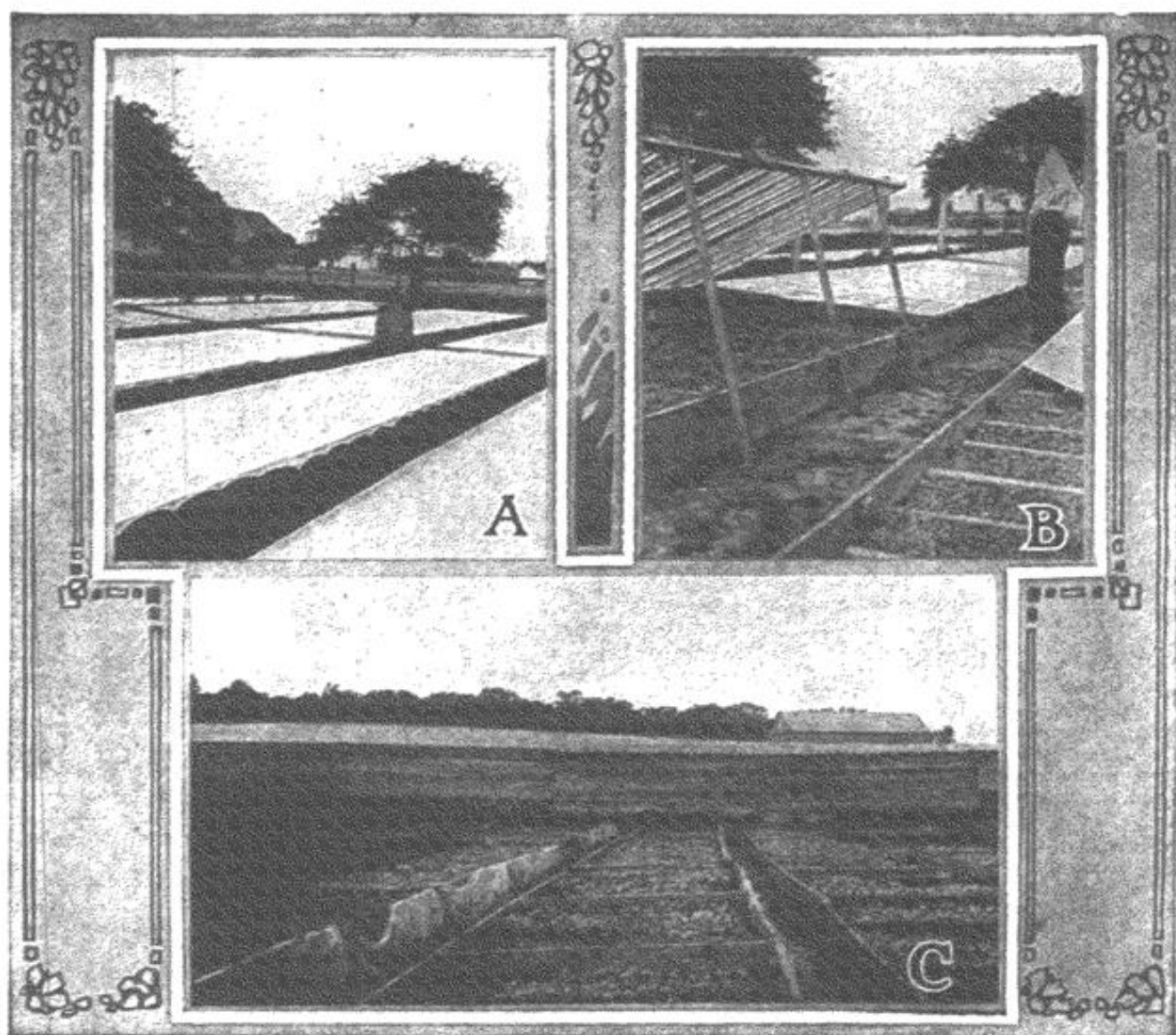
Cutting Tobacco Near Lexington, Ky.



An Excellent Type of Barn for Curing Cigar Tobacco, With Ventilators at the Peak of the Roof. Well Adapted to Artificial Heat Curing.



Sewing Leaves on Laths from Primed Tobacco "Out Door" Kind. (Not Shade Grown).



A & B—Glass and canvas covered seed beds. B—Canvas removed and sash raised for ventilation. Bulletin 238, Ohio Exp. Sta. C—Showing plant beds as used by Dept. of Agriculture, U. S. A.

Cultivation of Northern Cigar Tobacco

Management of Seed Beds:

The first essential of a profitable crop of Tobacco is a plentiful supply of good healthy plants available at planting time. The growing season in the Northern Cigar Districts is rather short at best, so it is highly important to have the plants ready on time, which is around the first of June in the northern districts. To do this the beds should be prepared and sowed early in April.



Field of Joseph P. Lutz, R. F. D. No. 1, Union, Ohio. He says it pays to use V. C. See his testimonial.

Location of Bed and Area Required:

The bed or beds should run about east and west, and be protected on the north and northwest by a suitable wind brake.

About 100 square feet will generally yield sufficient plants for an acre of Tobacco, but to furnish this number it will be necessary to draw over the bed a number of times in a period of two or three weeks. It is safer to allow about 150 square feet of bed for each acre of Tobacco to be planted.

Sterilizing the Bed:

Plant beds are subject to certain damping-off diseases of a bacterial or fungous nature such as stem rot and root rot. The germs of these diseases exist in the soil, and not infrequently cause great damage or the almost complete destruction and failure of the bed. Fortunately there are at least two practical methods of destroying these germs in the soil, thus preventing the diseases and the consequent risk of losing a crop of Tobacco.

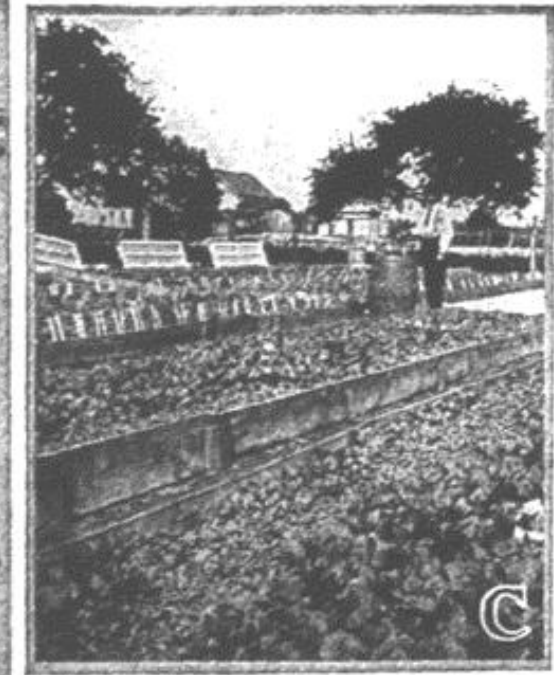
Sterilizing the Bed With Steam:

Both the Connecticut and Ohio Experiment Stations recommend steam sterilization as practical and the preferable method when a six to eight horse power boiler is available capable of maintaining a pressure of 80 to 100 pounds. A steam tight pan of galvanized iron or wood must be provided. The width of the pan should be sufficient to fit inside the permanent frame of the bed if it has one, (six feet is the more common width) and ten feet long. The sides of the pan are about 8 inches high which is fitted with a steam hose connection at one end and also with suitable handles at each end for conveniently lifting the pan in moving it from place to place.

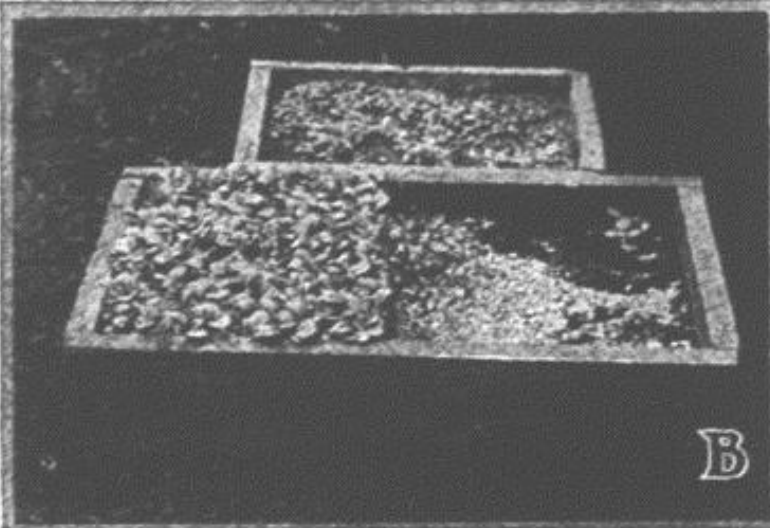
If manure is to be used on the bed it should be applied before steaming in order that any weed seeds it contains may be killed. The soil should be worked up about as in preparation for the seed to a depth of about four inches, as this allows the steam to enter and heat up the soil much more readily.



A



C



B



D

A & C—Beds for growing small lots of many kinds of plants, the different kinds separated by a lath. In C, pointed stakes are used and numbered in duplicate to be with each lot as it is transplanted. Bulletin 239, Ohio Exp. Sta.
 B—Showing effect of treatment in preventing stem rot Fungus. Bulletin 180, Conn. Exp. Sta.
 D—Tobacco seed beds with grass covers partly removed showing small seedlings, U. S. Farmers Bulletin 571.

Invert the pan over the bed, settling the edges well into the soil and apply the steam at a pressure of 80 to 100 pounds for a period of forty minutes to an hour in a place. It will take longer with the lower steam pressure. Put weights on the pan to hold it down, if necessary. When thoroughly steamed remove the pan to an adjacent part of the bed and repeat. After removing the pan the temperature of the soil at a depth of two or three inches should register 200 to 210 degrees Fahrenheit. Details of the construction of the pan are given in Circular No. 156 of the Ohio Experiment Station, Wooster, Ohio.

Weeds as well as the disease germs are killed by the steaming, and the saving in expense of weeding the bed will offset the expense of steaming.

Sterilizing With Formalin:

If the steam outfit is not available, satisfactory results may be obtained by thoroughly drenching the soil with Formalin solution of a strength obtained by mixing 1 gallon of the 40 per cent. formaldehyde, as obtained from the drug store or dealer in chemical supplies, with 50 gallons of water. This amount will be sufficient to treat about 100 square feet of bed. Where it is known that infection is present this amount may be increased to 1½ gallons of Formalin to 75 gallons of water. Apply the solution as evenly over the bed as possible, soaking slowly so that the liquid will not stand in pools or run off. Sometimes it is best to make two or three applications of the liquid instead of applying all at one time, in order to secure a more even penetration of the soil. Immediately after applying lay over the bed some material such as canvas to keep in the fumes.

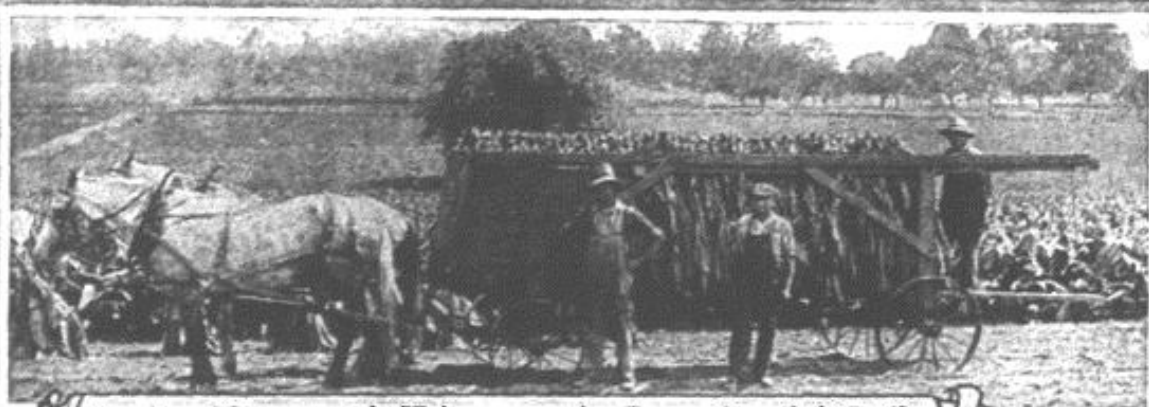
It is preferable to make the formalin treatment in the fall, but it may be applied in the spring if the bed is thoroughly aired and allowed to dry out sufficiently to bring it into good tilth before fitting the soil and sowing the seed. This will require about a week under favorable conditions.

Fertilizing the Seed Bed:

The seed bed should be made thoroughly rich, and if the best results are desired high grade commercial Fertilizers should be used, stable manure may be used to render the soil mellow and friable, but it is important also to use a liberal quantity of the more readily available and quicker acting commercial Fertilizer of the highest grade. Manure is likely to contain innumerable weed seeds, and if these are not destroyed by sterilization they may almost ruin the bed or cause great expense for hand weeding. Fertilizers should be applied a week or two before sowing, and should be well raked into the soil at the rate of from two to six pounds to every six square yards, according to the natural richness of the bed and the quantity of manure used.

Sowing the Seed:

If a plant bed is to produce a maximum number of first class plants the seed must be evenly distributed over the bed, and they must not be too thick. If the plants stand too thickly on the bed they will be spindling and tender and much more readily subject to the damping-off diseases. A rounded teaspoonful of well cleaned seed to 200 square feet of bed is about right. Mix this quantity of seed thoroughly with about three quarts of some good sowing material, (dry wood ashes is excellent) and distribute as evenly as possible, going over the bed at least twice.



Loading Wagons with Tobacco on the Farm of A. M. Griffin,
Granby, Conn. A User of V.C.



Stringing Tobacco (old style) on the Farm of B. L. Cook, Hadley, Mass.
Rich Growth aided by V.C.



Cutting Tobacco Plants on the Farm of August Mikolite, at
Wapping, Conn. Also a User of V.C.

As Tobacco seed are very small they should be raked in only lightly if at all, but rather they should be firmed into the surface of the finely prepared soil by rolling or other suitable means.

Care of the Bed:

As soon as the seed are sowed the bed should be covered with a good grade of muslin. Sometimes glazed hot-bed sash are used. On very cold nights strips of carpet or other suitable material should be spread over the bed as additional protection.

The surface of the soil should not be allowed to become dry during the period of germination or many of the seeds may be lost. During dry weather, while the plants are growing, it may be necessary to water the bed three or four times a week, but moderate moisture is better and more likely to produce healthy plants than too much watering to the point of keeping the soil continually soaked.

Regular and thorough ventilation of the bed is one of the most important requisites for the growing of good healthy plants. The damping-off and other bacterial and fungous diseases are decidedly favored by warm muggy conditions in the bed, and the plants grow spindling and very tender if the bed is not properly aired out by turning back the covering in the middle of the day at frequent intervals as required. The Connecticut Experiment Station in Bulletin No. 180 states that the most common causes for complete or partial failure of seed beds are too thick sowing and want of proper care in watering and particularly in airing the beds.

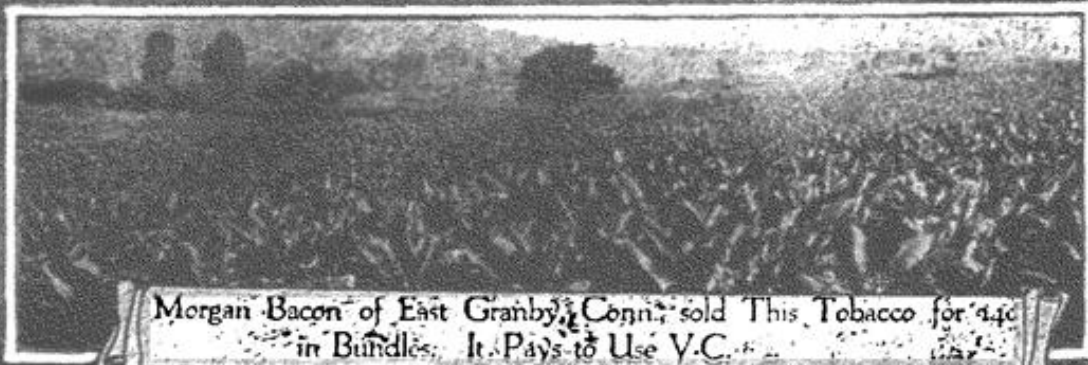
Fertilization

Of Great Importance:

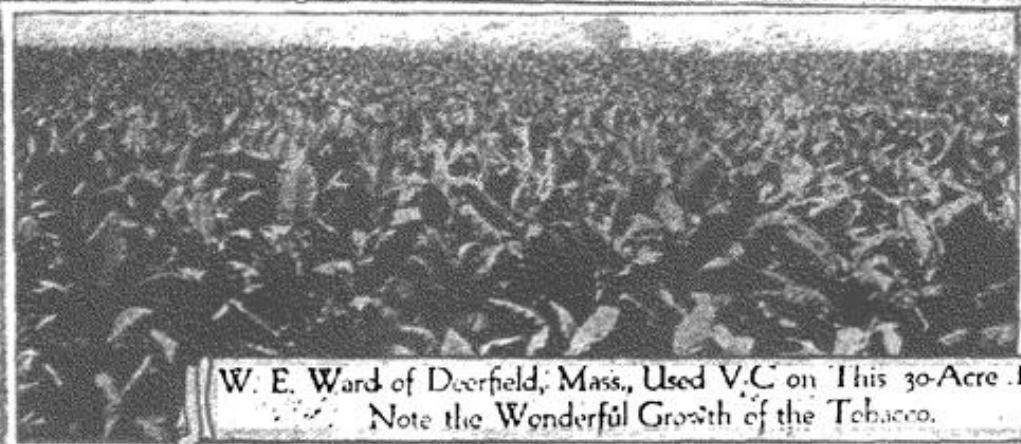
There is perhaps no other important field crop where proper and liberal fertilization with commercial Fertilizers is of such controlling influence as with Tobacco. The wise use of commercial Fertilizers not only permits of growing high grade Tobacco on soil that would not produce these grades without Fertilizer, but as is now being demonstrated in these districts, will enable the Tobacco growers to produce more per acre, often more than doubling the yield, and gives decidedly better quality and greatly increased profits.

Liberal Application Pays Best:

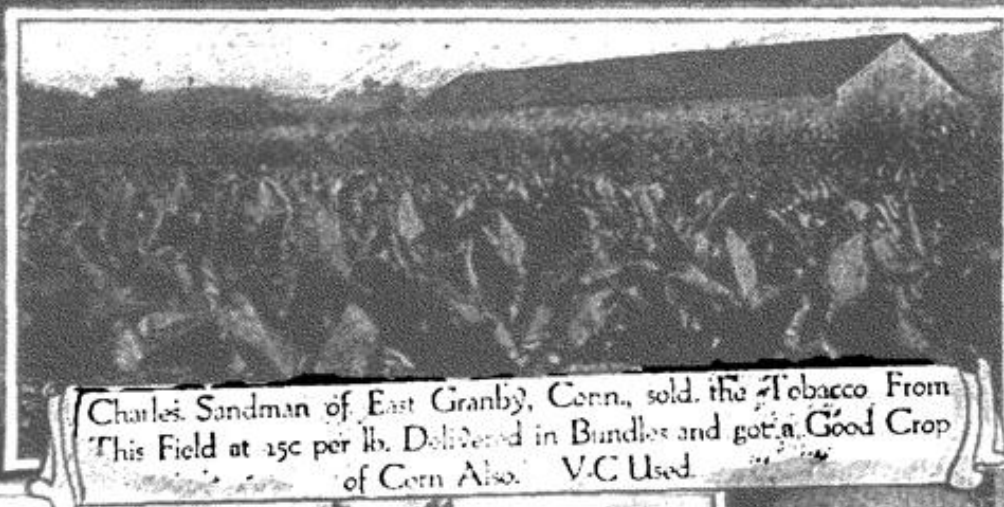
Throughout the Northern Tobacco Districts from Ohio east, including Pennsylvania, New York, and the New England States, the growing of heavy yields of the best grades of Tobacco is becoming more and more dependent upon the quality and quantity of the commercial Fertilizers used. In all these districts, as well as in the Southern Tobacco Districts, the U. S. Government and State Experiment Stations tests show that the heavy yields, best grades and top prices follow the use of high grade Fertilizers applied in liberal quantities. Thus, Bulletin No. 238 of the Ohio Experiment Station reports that: "Plat 13 at the Station received the largest total application of commercial Fertilizers, and is the most profitable plat on the farm." This plat received 1,140 pounds of a complete Tobacco Fertilizer per acre, and the author states further that it is quite possible, even probable, that a larger application would give even greater net returns.



Morgan Bacon of East Granby, Conn., sold This Tobacco for 44¢
in Bundles. It Pays to Use V.C.



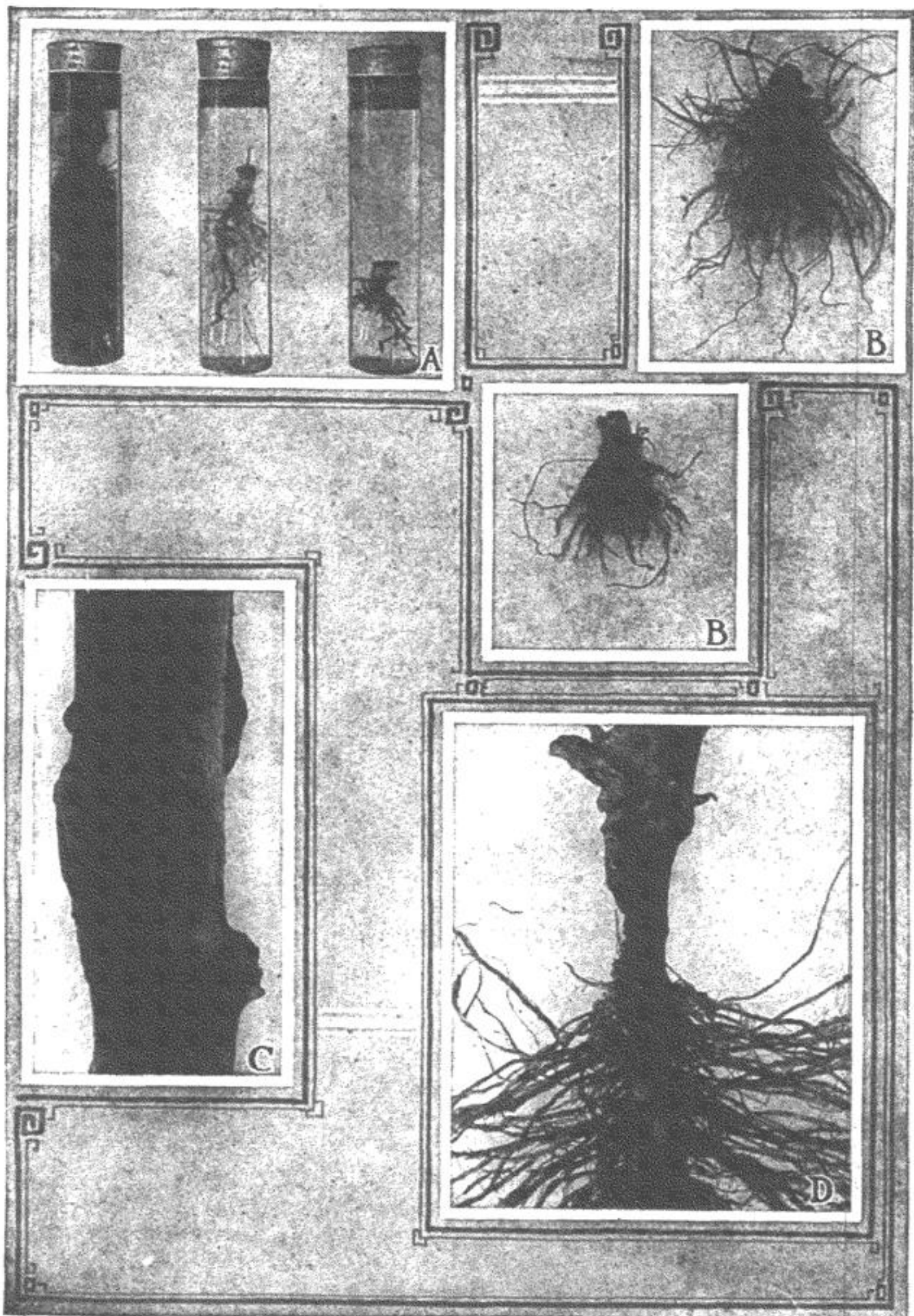
W. E. Ward of Deerfield, Mass., Used V.C. on This 30-Acre Field.
Note the Wonderful Growth of the Tobacco.



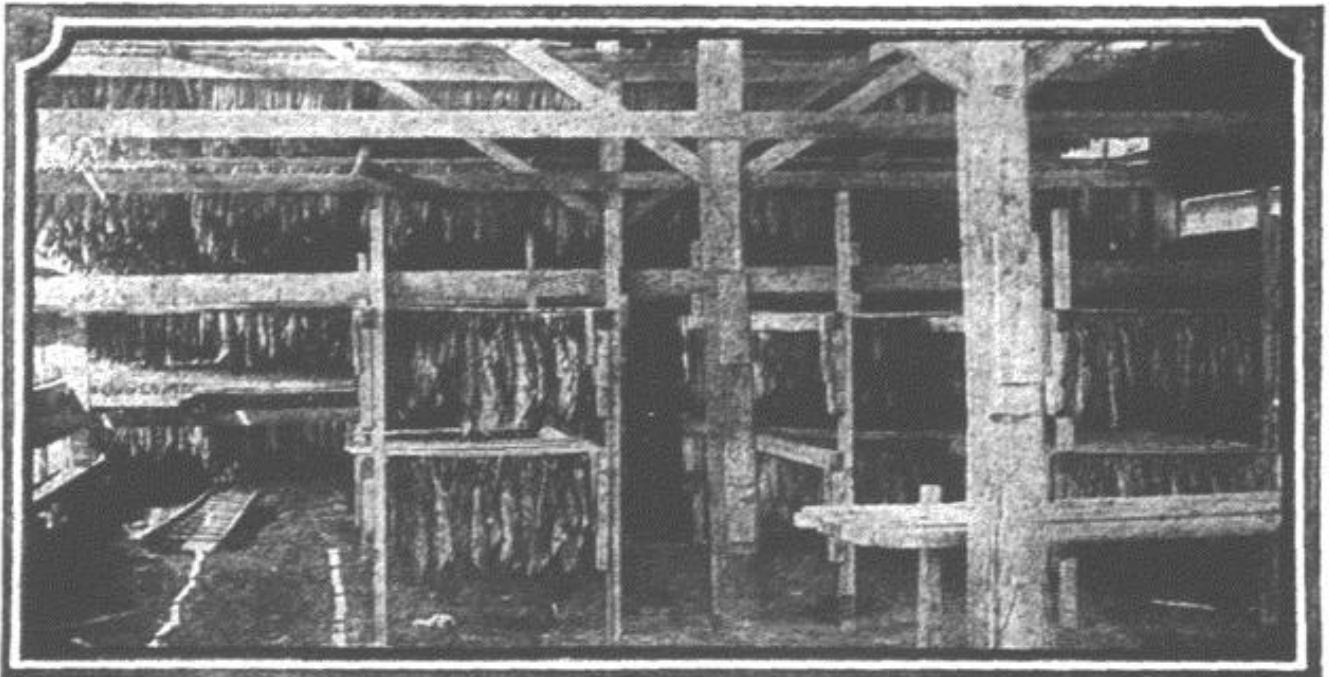
Charles Sandman of East Granby, Conn., sold the Tobacco From
This Field at 45¢ per lb. Delivered in Bundles and got a Good Crop
of Corn Also. V.C. Used.



Mr. R. Case in His Field of Outdoor Tobacco After its First
Priming. V.C. Brings Results.



A—Tobacco seedlings showing healthy root and those slightly or badly injured by root rot.
 B-B—Effect of rot on roots of mature field plants.
 C—Cankered area extending on stem from ground upward.
 D—Stem of tobacco plant girdled under ground. All above from Connecticut Experiment Station.
 Bulletin 180.



Mahlan D. Case, Granby, Conn. The first priming hanging in the shed.

Over 100 Per Cent. Increase:

Bulletin 285 of the Ohio Station reports a yield of 1,408 pounds of leaf per acre as an average for six years following the application of 900 pounds of a complete Fertilizer, and only 607 pounds of leaf as an average for six years from a field to which no Fertilizer was applied, an increase of 791 pounds per acre, which is considerably more than 100 per cent. increase in quantity, and the heavier yield was of better quality.

Highest Yields in U. S.:

In New England both the Connecticut Experiment Station and the Massachusetts Experiment Station have made extensive experiments with commercial Fertilizers on Tobacco, and from these experiments has developed the custom, because it has proved most practical and profitable, of using commercial Fertilizers with the most discrimination and in the most liberal quantities anywhere in the United States. Indeed the general practice there is to use from 2,000 pounds to 3,000 pounds of high grade Fertilizers per acre, and the use of this higher quantity is by no means uncommon, and is increasing in frequency because it has been found that as much as and sometimes even more than 3,000 pounds per acre give the better results. As a result of this liberal use of Fertilizers the average yield of Tobacco per acre in Connecticut and Massachusetts is by far the highest in the United States, and the money value per acre is at a still greater proportionate increase as compared with any other section of the country, as has already been pointed out. In these States a harvest of 2,000 pounds or more of cured leaf per acre is very common, and a money value of \$400 to \$500 per acre is a frequent occurrence. These figures are for the sun-grown product. Under shade the raw Tobacco in the bundle generally brings \$600 to \$800 per acre. In the other Northern Cigar Tobacco Districts (and it is likewise true for the Southern Heavy Tobacco Districts) the tendency is toward following the lead of New England in making increasingly liberal applications of commercial Fertilizers to Tobacco, and with most gratifying results.

For Cigar Tobacco Avoid Fertilizers Containing Chlorine:

One of the important points of quality in Northern Tobacco, used as it is almost entirely in the manufacture of cigars, is that it should burn well, and this applies to the wrappers and binders as well as fillers. A liberal use of potash in the Fertilizer is beneficial to the burning quality, but it is important that the potash be derived from sources not containing chlorine, as this chlorine is very likely to offset the favorable effect of the potash and cause the production of Tobacco of bad burning quality. Muriate of potash, Kainit and manure salt contains chlorine, but sulphate of potash does not contain chlorine.



Joseph P. Lutz, Union C. Exhibiting some of his tobacco plants grown with V. C. See his testimonial.

Need of Humus in the Soil:

One of the important points for the Northern Tobacco grower to consider, especially in New England, where it is the custom to plant the same land in Tobacco year after year, is to provide for an adequate supply of vegetable matter in the soil to keep it mellow and friable and of good moisture holding capacity. This can be accomplished most economically by growing a winter cover crop, and for this purpose vetch or rye have proven very satisfactory. The vetch is preferable because it is a legume, thus adding to the nitrogen supply, and decays more readily in the soil after being turned under. If rye is used it should be turned under while it is still tender, as the hard straw decays very slowly, and in the event of dry weather during the growing season is likely to hold the land open and cause the drought to be more severe in its effects.

Preparation of the Soil

One of the most important points in the successful growing of Tobacco is thorough fitting of the soil preparatory to setting out the plants. If a winter cover crop is grown or the land is in sod it is very important that the field be thoroughly disk harrowed before it is plowed. This will be an important aid in securing a good tilth all through and not merely on the surface. The soil will settle together better and will be much less likely to suffer from drought. The newly set plants will also be more likely to live and grow off quickly and uniformly.

After being well plowed the field should be again thoroughly cut to pieces and settled together with the disk harrow, and then finally, just before transplanting the Tobacco, it should be gone over once or twice with a lighter harrow that will effectively level and pulverize the surface to a depth of two or three inches. A harrow of the Acme type is among the best for this purpose.

Transplanting

In the Northern Cigar Tobacco Districts the greater part of the acreage is now set out by means of the two horse machine transplanter, and it has been found that the plants live and grow off better and more uniformly than do the hand set plants. Machine setting is of course a much easier as well as a more expeditious method.

Distance to Plant:

The distance between the rows varies from about 34 to 40 inches. The smaller sorts such as Havana Seed, Zimmer Spanish and Little Dutch being spaced somewhat closer than the larger growing Broadleaf and Seed-leaf types. In the rows the distance varies from about 16 inches to 2 feet or even 2½ feet. In the wrapper districts it is customary and desirable to set the plants fairly close in the row in order to produce the thinner and finer leaf desired for wrappers.

The chances of securing a good uniform grow off are much strengthened if the plants are stocky and of a uniform size of about six or eight inches long. Very small plants or those having a long spindling stem quickly succumb to any unfavorable weather in the few days just after planting. In setting the plants great care should be taken to get the bud close down



Louis R. Lobdell, Vernon, Conn. "Largest Tobacco in Town" (37 inches long, 21 inches wide).

to the surface of the soil, as they will be more likely to live and grow off well if this is done with care.

Replanting the missing hills must of course be done by hand, and should begin in four or five days after the field is set out. For resetting especially strong vigorous plants should be selected so that they may grow off as nearly as possible with the others.

Poisoning for Cut Worms

If cut worms are numerous enough to do any considerable damage they can be effectively combatted by means of the poisoned bran mash bait. This is prepared by mixing one pound of Paris Green with 50 pounds of wheat bran. Moisten this with well sweetened water sufficient only to make a dryish granular mash that can be readily dropped, about a teaspoonful close to each plant of Tobacco. The cut worms seem to prefer this to the young Tobacco plant, hence—an efficient remedy.

Combatting Horn Worms

The characteristic and especial enemy of Tobacco is the horn worm. When only a few are present they generally can be handled successfully by hand picking, but when present in great numbers, as they frequently are, the best method is to poison with Arsenate of Lead or Paris Green.

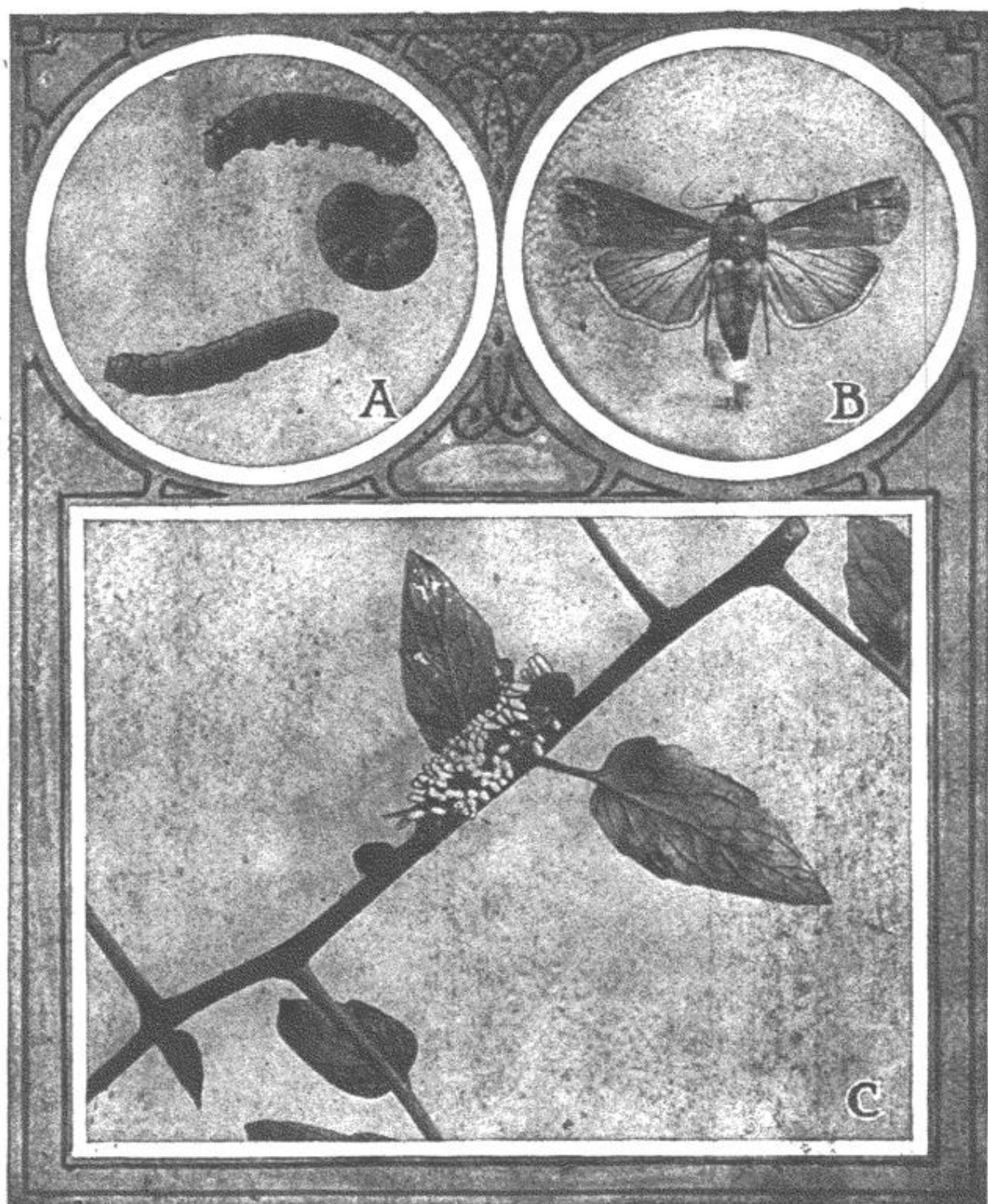
Arsenate of Lead costs more than Paris Green, as it takes about five pounds to go over an acre of full grown Tobacco against one pound of Paris Green, but the Arsenate of Lead adheres to the leaves much better, not being so readily washed off by heavy rains. It is rarely necessary to use more than a single application of Arsenate of Lead. It also has the very important additional merit of not burning the leaves which Paris Green sometimes does.

Either material may be applied in the dry state, but to apply the Lead satisfactorily a special type of dust gun is necessary, as it clogs in the spout of the ordinary type of gun. A duster that has been found to work satisfactorily by many Tobacco growers, and devised for this particular purpose, is that manufactured by the Tow-Lemons Company of Cedar Hill, Tennessee.

Paris Green may be applied most easily with a blower gun, but a more even distribution will be secured, with less danger from burning the leaves, if $\frac{1}{2}$ pound of Paris Green is mixed with 40 pounds of hydrated lime, the mixture applied with a shaker. The Ohio Experiment Station in Bulletin No. 238 reports that it obtained better results in its experiments from mixing the Paris Green with lime, and recommends this method.

Cultivation

Cultivation should begin very soon after transplanting if a good crop is desired. It is advisable in most cases to give at least one thorough hand hoeing and more if needed. The five tooth adjustable cultivator is one of the best implements for horse working Tobacco, and the field should be cultivated every week or ten days as long as it is possible to get through the rows without damaging the leaves or until the Tobacco begins to ripen. At the second cultivation, after the plants have become thoroughly established but before the roots have begun to spread across the rows, it is advisable to give a fairly deep cultivation in order to loosen and mellow the soil after the packing it has received while setting out and replanting the crop.



A—The Varigated cutworm, two thirds natural size.

B—Moth of black cutworm, two thirds natural size.

C—Tobacco or Horn worm, all from Bulletin 180, Conn. Exp. Station.

Topping and Suckering

In six to seven weeks after transplanting cigar Tobacco to the field, under normal conditions, it will begin to send up its seed head. In nature the production of seed is, of course, the real purpose of the plant. It is found, however, that the leaves develop much better in size, weight and quality if the seed head is removed soon after it appears, thus saving the energy of the plant for leaf growth which would otherwise go into seed development.

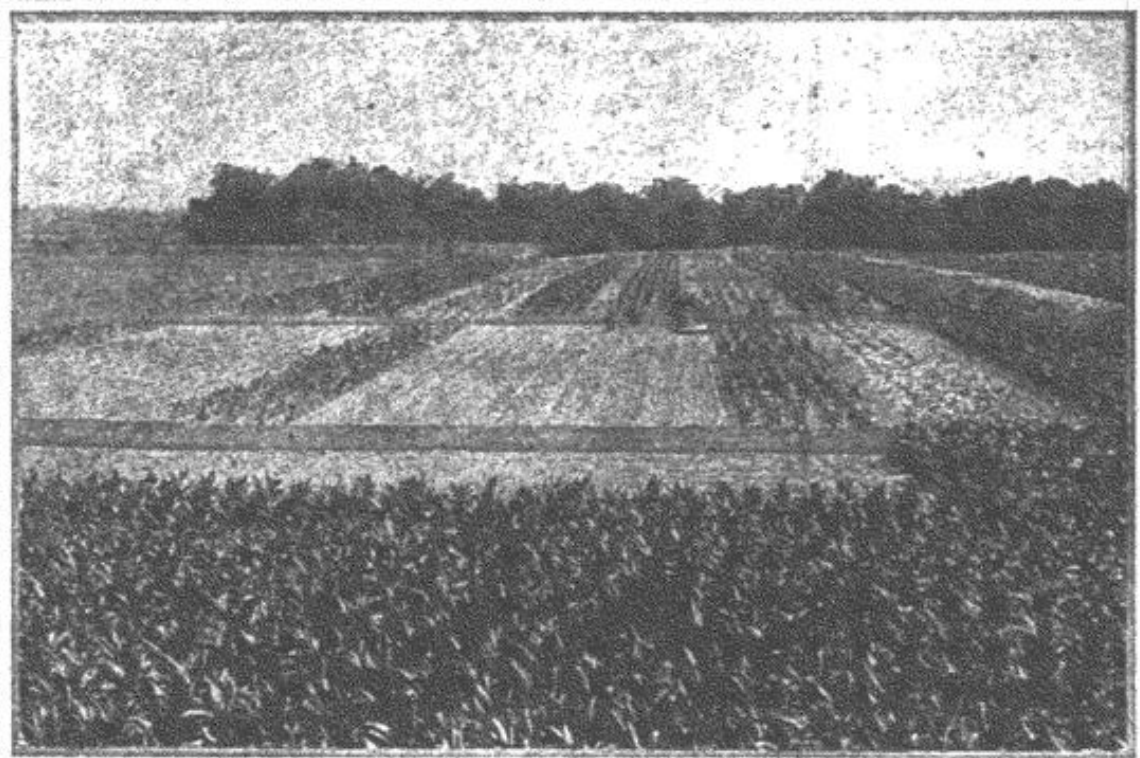
In the case of the heavy export Tobaccos it is customary to top as soon as or before the seed bud can be seen, but in cigar Tobacco it is better practice to let the seed head come out more fully before breaking it out—soon after the first blossoms begin to open on the earlier plants is about the right time for topping in the Northern cigar districts. Height of topping depends on vigor of plant. Filler Tobacco is topped lower than wrapper Tobacco in order to produce a thicker, richer leaf. For wrappers all leaves are left that are likely to reach a reasonable size, generally about twenty leaves.

Soon after topping, shoots or suckers will begin to grow out from the axils of the leaves, a new effort on the part of the plant to fulfill its mission of seed production. These suckers must also be removed. Practice varies, but in the filler districts at least the field should be suckered over at least twice under ordinary conditions—the first time, after the top suckers, which come out first, begin to get some length but before they get hard, and again just before harvesting. The Ohio Experiment Station's reports show that in the production of filler leaf three or even four suckering are likely to prove profitable. Their experiments show that thorough suckering, by going over the field every week or ten days, gives a leaf of heavier body and better quality and an increased yield per acre.

When, however, the aim is to produce Tobacco suitable for wrappers, a thinner leaf that will cure with a light color is desired. Too early topping and too close suckering in the production of cigar wrappers or binders is less desirable than in the production of fillers. The more common practice in the wrapper districts is to sucker but once a few days before the harvest.

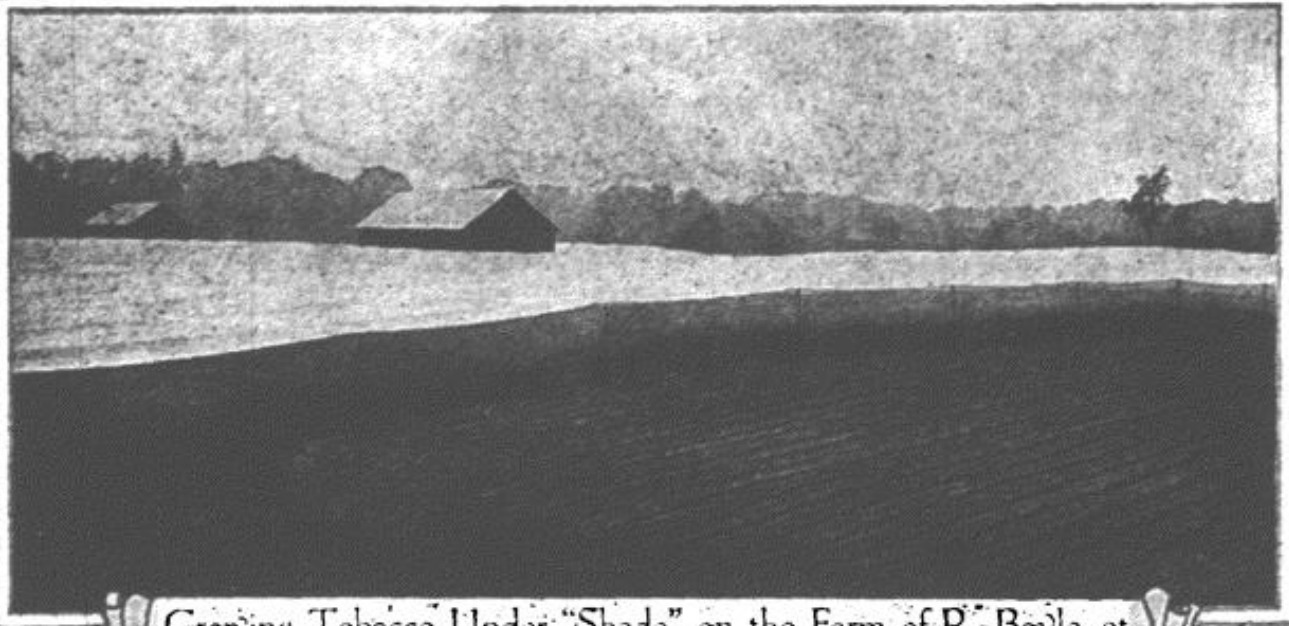
Harvesting Cigar Tobacco

Tobacco intended for fillers may be allowed to stand in the field to advantage, longer than wrapper Tobacco, thereby ripening and thickening. In wrapper leaf, however, elasticity, thinness and lustre are important elements of quality, and even a small degree of over-ripeness tends to destroy these qualities. For this reason it is important to harvest wrapper Tobacco at just the right state of ripeness, and it is better to be a little under ripe rather than over ripe. Even a few days of delay after it is right may make a great difference in the value of the crop. This is one of the principal reasons why the practice of picking the leaves as they ripen is becoming increasingly prevalent in the Connecticut Valley. Each leaf may then be harvested more nearly at its best, with the result, as determined by numerous experiments, that there is an improvement in average quality, in addition to some 12 to 15 per cent. increase in yield per acre.

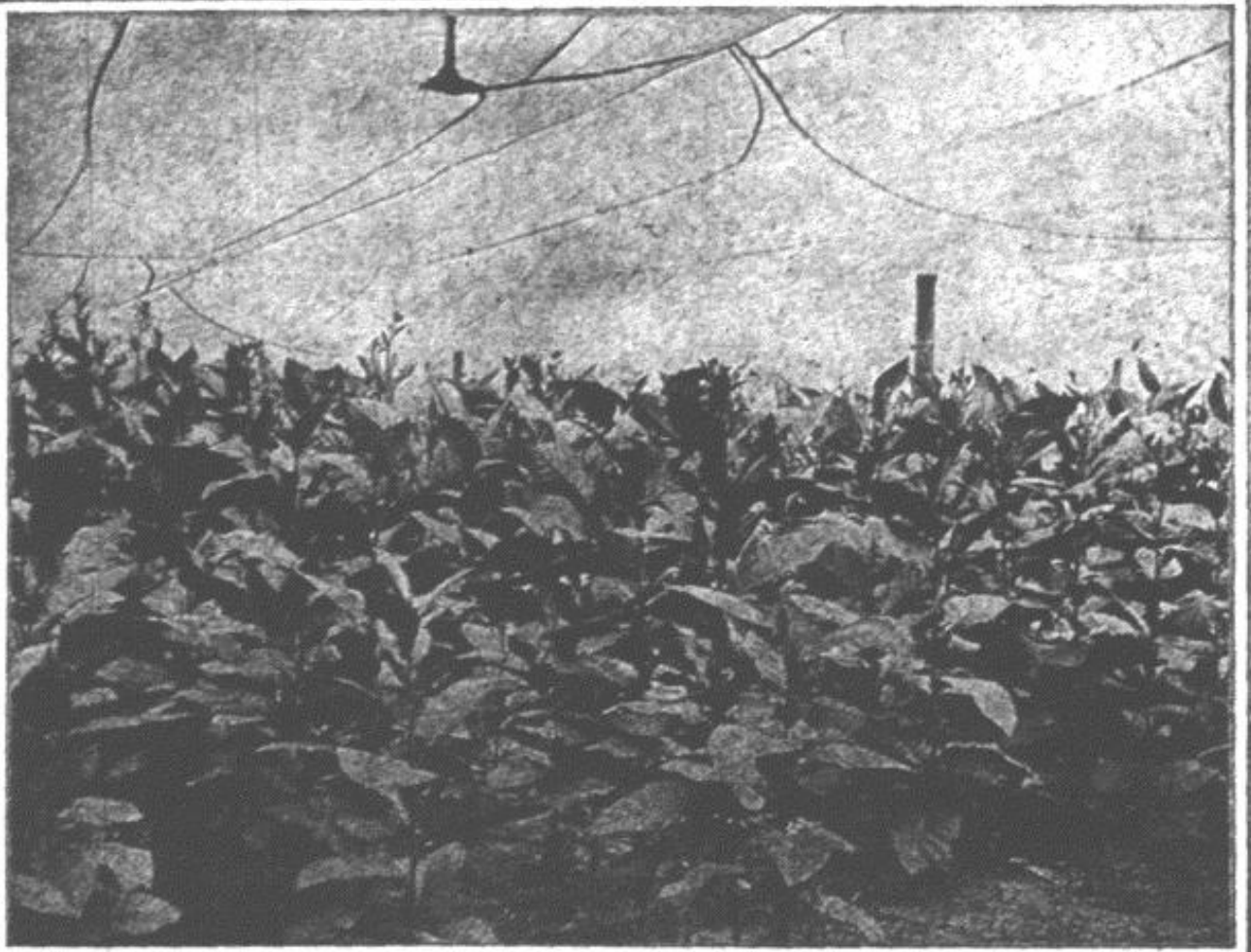


Upper View. General view of the fertilizer plots, Southwestern Test Farm, Germantown, Ohio, 1910. Note the small growth on unfertilized plots in background, with two fertilized plots between the unfertilized in each case. Unplanted Zimmer Spanish in foreground.

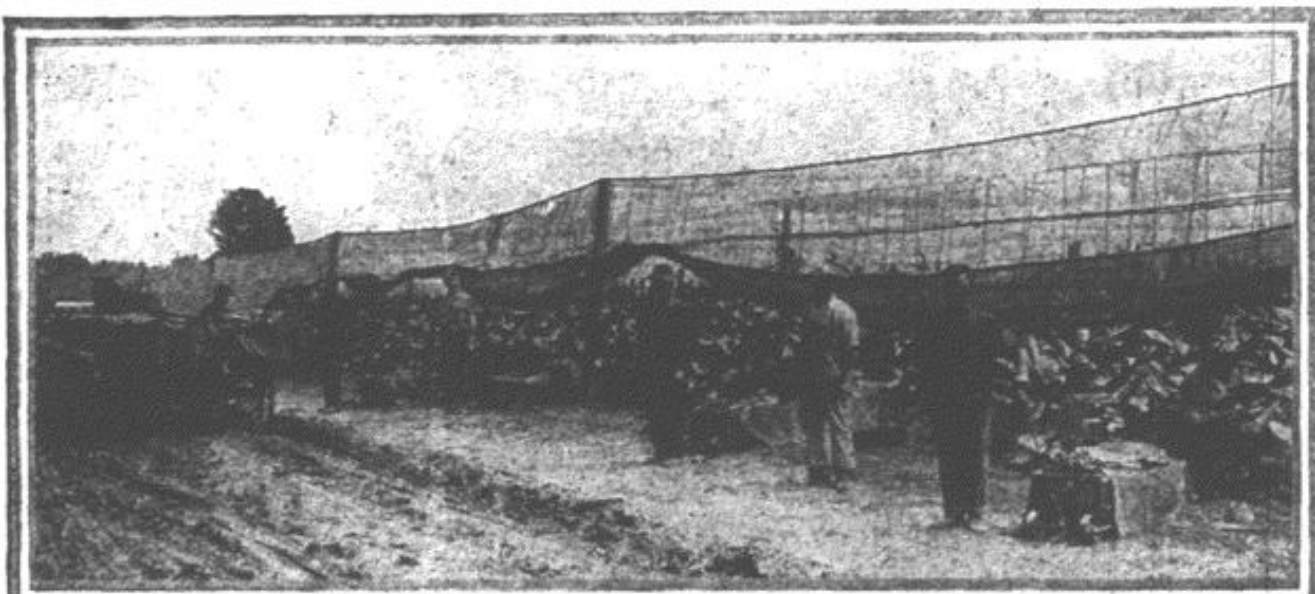
Lower view. Cultivating young plants of shade grown tobacco before the cover has been put on.



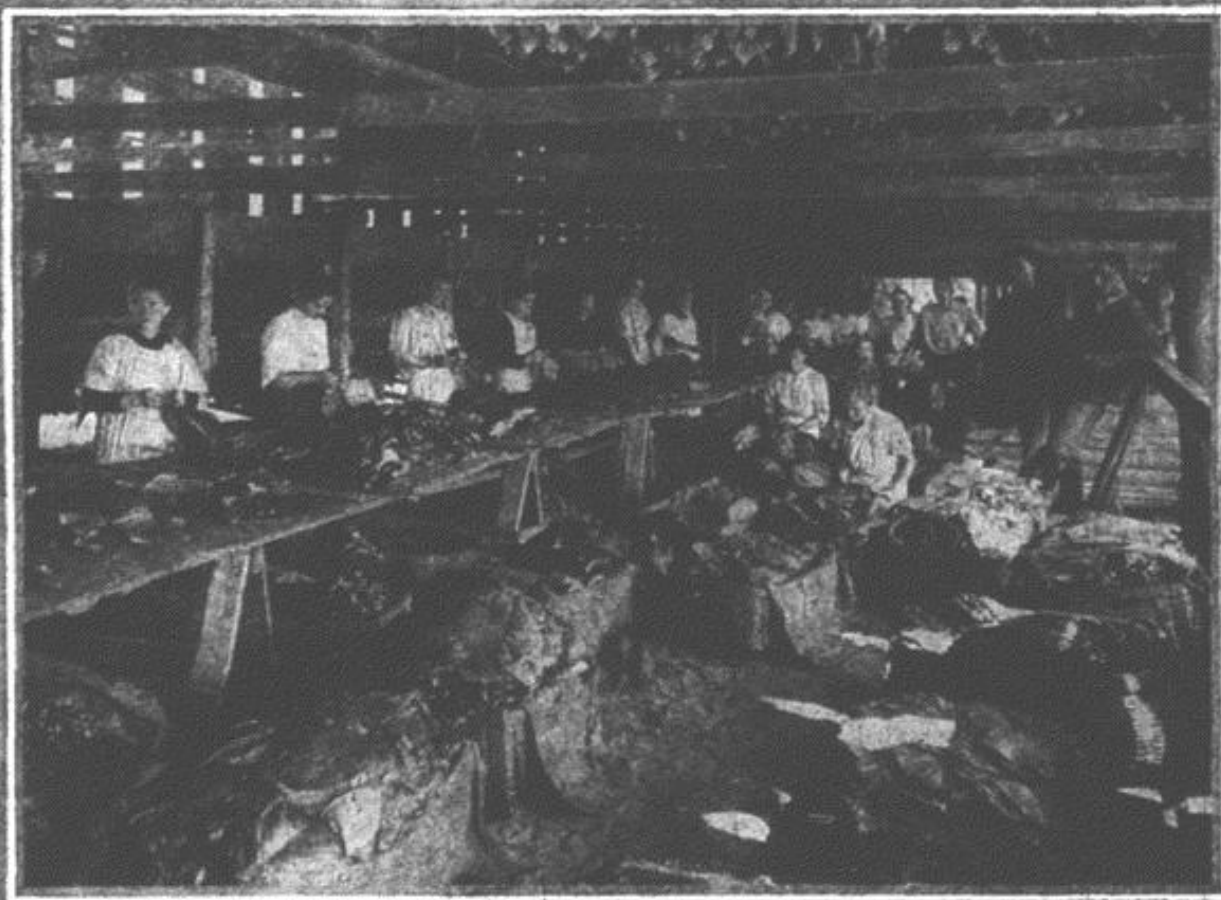
Growing Tobacco Under "Shade" on the Farm of R. Boyle, at
Hatfield, Mass.



View of Mr. Boyle's Tobacco Field Under "Shade"



Picking the Leaves on F. D. Hubbard's 35-Acres of Shade Grown Tobacco, at Sunderland, Mass.

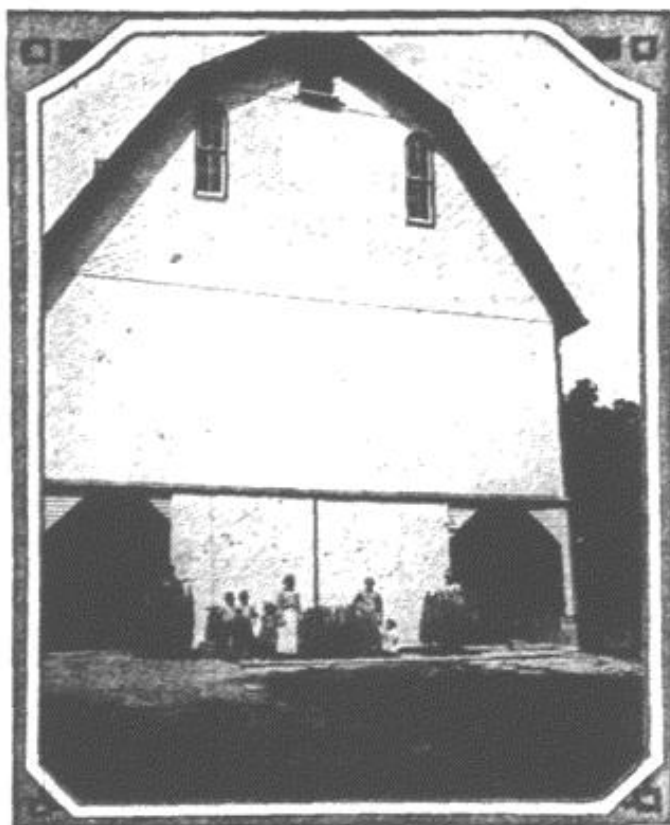


Interior of Mr. Hubbard's Drying Barn—"Sewing on the Leaves," Prepared to Hanging.

However, the larger proportion of wrapper and binder Tobacco and practically all the filler types is still harvested by cutting the entire plant at a stage of growth when the plant as a whole is at its best average condition. For wrappers this average state of development is generally reached in from 15 to 20 days after topping, while fillers are allowed to stand from 3 to 5 weeks.

Judgment and experience are necessary to determine the best stage of ripeness indicated in the beginning by a slight change of color to a lighter shade around the edges and tip of the leaf, followed shortly by a somewhat lighter shade over the entire leaf. Ripening begins, of course, at the bottom of the plant.

Choose the time for harvest when the whole field or some particular portion of it is in the best average state of ripeness, for it is usually best to cut clean as you go over that part of the field thought to be in the right stage for cutting. Do not begin to cut in the morning until the dew is dried off or nearly so, and lay the plants all one way as they are cut. Pretty thorough wilting is desirable, but care should be taken that none of the plants sunburn, which they will do in a short time (an hour or less sometimes) near midday in hot weather.



A modern tobacco barn, on the Farm of Baughman Bros., Arcanum, O. It accommodates 9 tiers of large tobacco with vertical spaces between tiers of about 5 feet each. Total height 47 feet.

The plants may be speared or spudded on the sticks or laths in the field, or hauled to the curing shed for the purpose. If the Tobacco is large five or six plants to the stick will be sufficient, on up to as many as ten or even more in some cases if the Tobacco is small. Sometimes it is convenient to hang the sticks of Tobacco on a rack or scaffold in the field for two or three days before hauling to the curing barn. In the barn the sticks should be spaced on the poles from 8 to 12 inches apart. Sufficient space should be given both on the stick and on the poles between the sticks to allow adequate ventilation. If placed too thickly the air spaces will clog during the two or three weeks after harvesting, and if warm, muggy weather prevails for any length of time great loss may result from poles weating.

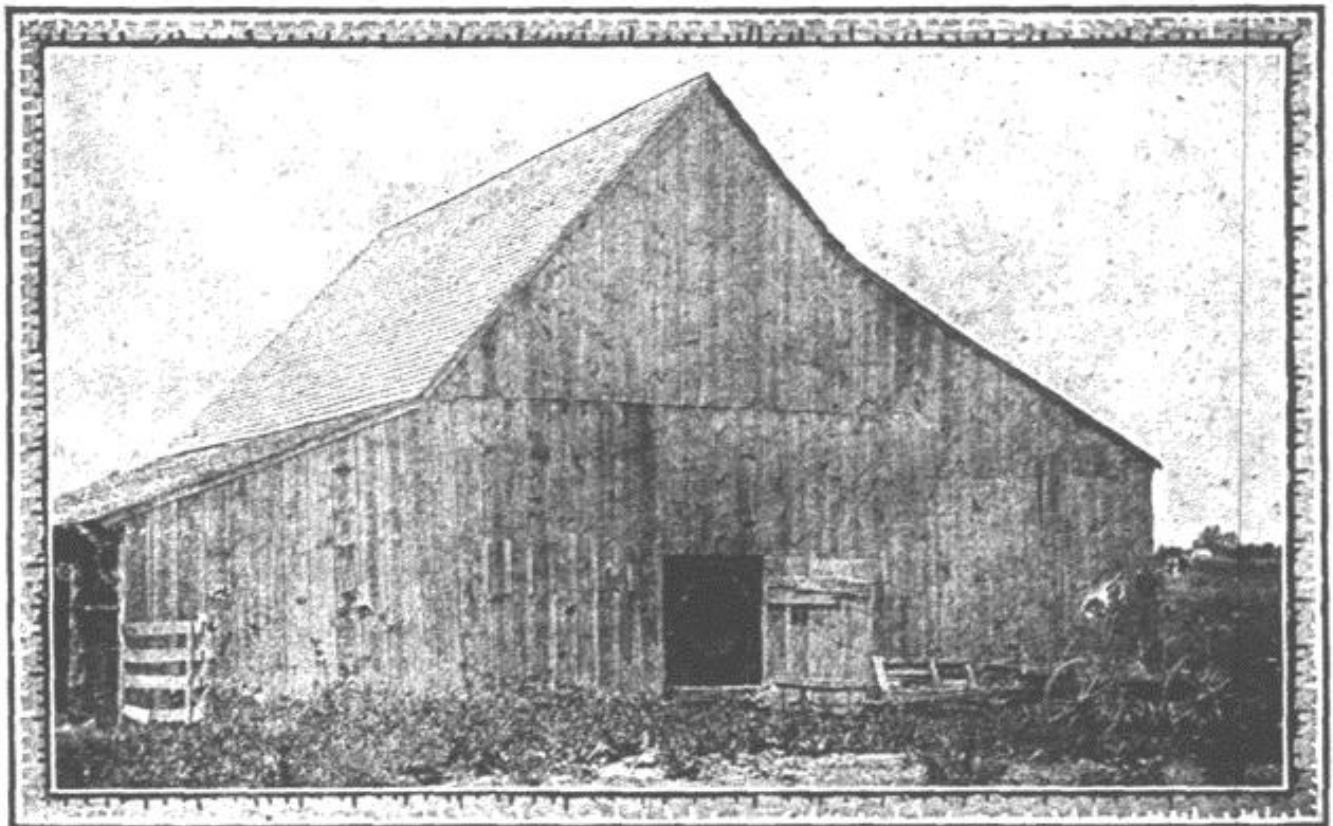
Management of the Curing Barns

Northern Cigar Tobaccos are all air cured by natural ventilation, that is, artificial heat is not used except in special cases to prevent damage from pole sweat in bad weather.

In order to have any adequate control over the curing process the shed should be of reasonably tight construction, fitted with plenty of ventilators to permit of rapidly changing the air when needed. If the weather is too very dry during the first few weeks of curing, the Tobacco will dry prematurely before the desired changes have had time to take place in the leaf, which require the presence in the leaf of at least a moderate amount of moisture. Premature drying in this way is called "haying," that is, the Tobacco dries up like hay, too rapidly for the best results. On the other hand several days of continuous warm moist weather is likely to cause damage, sometimes very extensive, from pole sweating.

Importance of Ventilation:

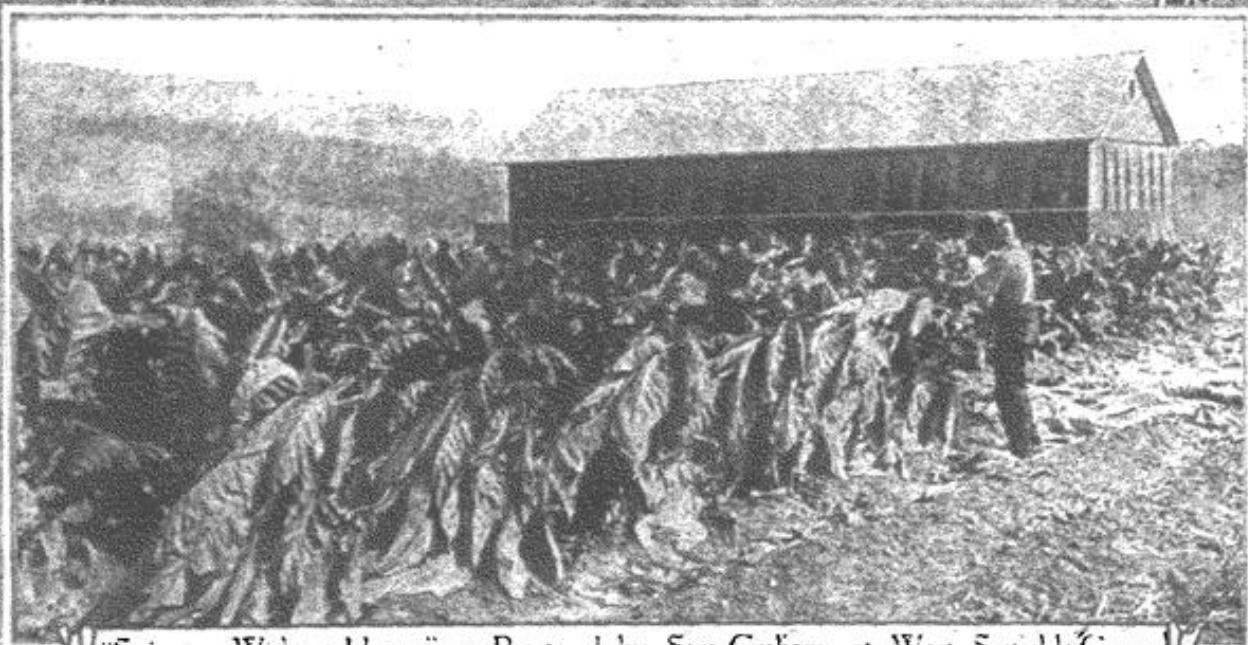
During the first three or four days after cutting, the barn should be closed, as this favors the proper yellowing of the leaf which is the first change to take place in curing. After this the ventilators should be opened for a few hours in the middle of the day during fair weather to start the leaf to drying, and from this time on the grower will have to use his judgment as to ventilation. The idea is to secure moderate drying while at the same time retaining sufficient moisture to permit the necessary chemical changes to take place in the leaf incident to proper curing, for curing is not mere drying.



A Maryland tobacco-curing barn, Upper Marlboro, Prince George Co. Md.



Old Style Method of "Stringing and Loading" the Plants on the Henry Sargeant Farm at Broad Brook, Conn.



"Stringing Without Horses" as Practiced by Sam Graham, at West Sayfield, Conn.



V-C Fertilizers Used in Producing This Wonderful Growth of Tobacco on the [unclear] N. S. [unclear] by R. [unclear], Conn.



Packing House of M. W. Boyle, Hatfield, Mass.



Field of Patrick Mullaney, Hatfield, Mass. This Tobacco is Growing on River Bottom Land—a Very Fine Crop. V.C. Used.



A Wonderful Field of "John Williams" Tobacco Grown by Julius Palm, Buckland, Conn. V.C. Used.

When the weather is too dry the best results will be obtained by closing the ventilators during the day time so as to keep out the drying winds, and opening them at night to admit the moisture laden night air. On the other hand when moisture is too abundant it is best to keep the ventilators closed at night, opening them in the day time when the conditions are most favorable for ventilation and drying, generally in the middle of the day, if it is not raining. Even in a protracted warm moist spell it will rarely happen that the barn can not be aired to advantage for a few hours every two or three days.



White burley tobacco on the farm of Myers Bros., Cave City, Barren Co. Ky. Grown by S. L. Bell, who used V. C. 2-10-10, Kentucky Burley Tobacco Special.

Proper Temperature—Use of Artificial Heat:

However, there are times when it will be practically impossible to prevent pole sweat damage unless artificial heat is resorted to, but in order to do this successfully it is necessary to prepare for it in advance. Either charcoal or dry pine wood that will not smoke much may be used, and the sides of the shed must be reasonably tight in order to retain the heat enough to do much good. The heat should be sufficient to raise the temperature 15 to 20 degrees above the outside air, and if begun should be continued long enough to actually dry Tobacco somewhat, otherwise more harm than good may be done. A little added warmth in the barn without any drying of the leaf will make the conditions even more favorable for the development of the pole sweat bacteria.

In the Connecticut Valley artificial heat is used by an increasing number of growers to protect against pole sweat damage. Some of the shade growing companies use artificial heat at certain stages of the curing process whether actual pole sweat is threatened or not. It is believed that lighter colors result in the cured leaf more consistently when artificial heat is used. Certainly any Tobacco will darken in color if kept too long in "high case."

Taking Down and Stripping

When the mid ribs or stems of all the leaves are thoroughly cured, generally in about eight weeks after harvest, the Tobacco may be taken down for stripping. October and November are the months in which this is done to the best advantage. After the winter is fully on it is often difficult to get the Tobacco in sufficiently good case to take down without breaking the leaves badly. On the other hand it is better not to let it get into very high case because the leaves will stick together badly when lying in the bulk, and bother in stripping, and the excess moisture may cause mold or other damage to start in the Tobacco. After being taken down and put in bulk it can be stripped later at almost any time if a suitable stripping room is available. The bulk should of course be well covered, top and sides, to prevent the Tobacco from drying out.

Stripping in Grades:

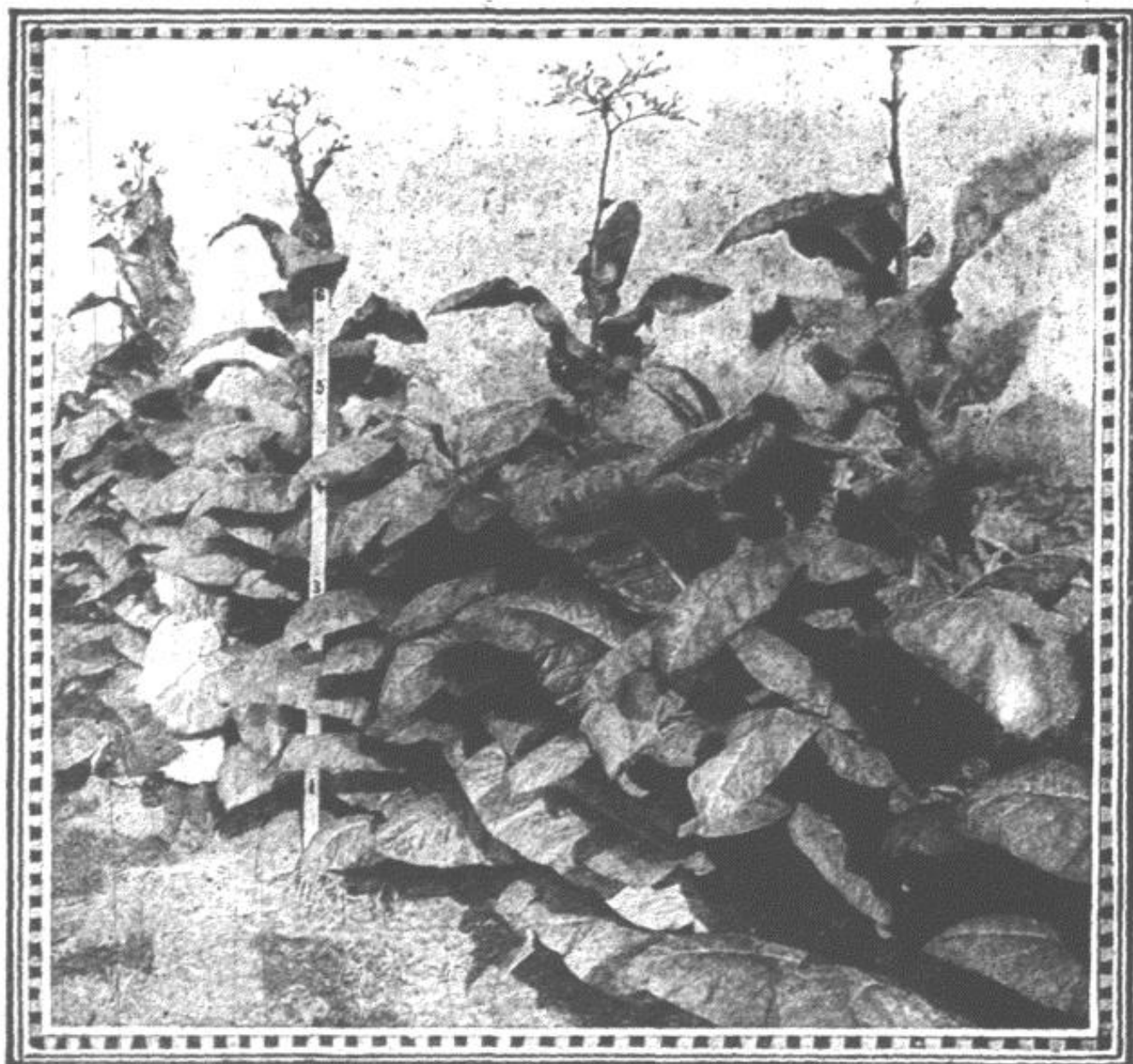
In stripping an approximate division as to quality should be made into at least two grades and generally better into three grades. The poor and trashy bottom leaves should be separated from the good leaf of the rest of the plant, and it is deemed advisable to keep the underripe and shorter top leaves by themselves. Leaves damaged from pole sweat or similar trouble should of course not be mixed with sound leaf.

It is best to refrain from any artificial moistening of the leaf if possible, but with the best of care it sometimes becomes necessary to moisten it a little. When necessary the water should not be sprinkled on but "blown" on with a suitable blower; and in order that the moisture may draw through the leaf evenly it should be packed down in a warm room and well covered.

Packing and Handling:

For delivery to the packer the leaves are packed in bundles of about 30 to 50 pounds each, wrapped in paper, tips lapping in the middle with butts exposed to the end; or they may be "knead" into cases, tips lapping in the middle, according to local custom, or by agreement with the purchaser.

Subsequent handling by the packer consists of more or less careful grading as to size, color, and other qualities into the various grades of binders, wrappers, or fillers; tying into hands, and a period of fermentation by the natural, forced or bulk sweating process, followed perhaps by a period of ageing to put into final shape for manufacture into cigars. Concerning the packers part of handling cigar Tobacco it is not necessary to go into details here as it has generally left the farmers hands when this takes place. Nevertheless it is desirable for the grower to have some knowledge concerning these processes since they will serve as a guide and stimulus to proper methods of production on the farm to the desired end of producing Tobacco of the highest quality that will demand the top market price.



A row of a tall type of Hybrid 199, a very productive form. This particular row yielded 3,693 pounds per acre of wrapper and filler. Bulletin 239, Ohio Experiment Station.

Cultivation of Export and Manufacturing Tobacco

These types are designated by this general title by the Tobacco trade to differentiate them completely from cigar Tobacco. Originally cigars were made almost entirely by hand as a home industry. Hence the name manufacturing types was used to include the kinds used in the manufacture of chewing and smoking Tobacco, cigarettes, and snuff which were manufactured in factories with quite elaborate machinery. These are also the types grown originally, or developed from those grown originally, in Virginia and Maryland, and now grown extensively in the Carolinas, Kentucky, Tennessee, southern and eastern Ohio and West Virginia.

According to U. S. Government reports the total production of manufacturing and export types of Tobacco is about 800,000,000 to 900,000,000 pounds per annum, of which about half is exported. Some of these types are used almost entirely in domestic manufacture and consumption, while others are used principally for export. Thus nearly all Burley is used in domestic manufacture, as is nearly all of the Sun Cured of Virginia and nearly half of the Bright Flue Cured. On the other hand some 80 per cent. or more of the dark fired Tobacco of Virginia, and the dark Tobacco of western Kentucky and Tennessee, and the lighter Maryland Tobacco is exported, principally to European countries which consume much larger quantities of Tobacco than they produce.

Cultivation of Tobacco in the Western Districts

By Western Tobacco Districts are meant those west of the Alleghany mountains, principally within the States of Kentucky and Tennessee, and adjoining areas in Ohio, Indiana, and West Virginia.

Kentucky is the leading State in the production of Tobacco, and within its borders is grown fully a third of all the Tobacco produced in the United States. In western Kentucky and Tennessee dark Tobacco cured by open fires and smoke is produced in large quantities similar to the Dark Fired Tobacco of Virginia, and methods of production are very similar. In central Kentucky, centering in the famed blue grass section, White Burley Tobacco is grown extensively. The Burley District extends across the Ohio River into a number of counties of Ohio and Indiana, and into West Virginia. Between the Burley District of central Kentucky and the Dark Fired District of western Kentucky there is a considerable production of dark Tobacco similar to the dark Tobacco produced farther west, only it is air cured instead of fire cured. This district extends across the Ohio into Indiana on the north and into the upper Cumberland country in Tennessee on the South.

Preparation of the Plant Bed

Selection of Site:

Fresh land is best and should be chosen by all means if available. The soil should be a mellow friable loam well filled with humus, and of a nature to withstand drought well. The surface drainage as well as the under drainage should be good. If water stands on the bed for any length of time it will be ruinous to the plants. In hilly countries plant beds are often located on quite steep hillsides. In such cases steps should be taken to prevent surface washing by ditching around upper side of the bed or other suitable means. A slope to the south or east is preferable, particularly toward a small stream if there is no danger of water sobbing or overflowing. In the event of a prolonged drought the stream is available for watering the bed. A woods location is generally chosen, and enough of the trees, particularly to the south and east, must be cut down to allow sufficient sunlight to reach the bed. Protection on the north and west is an advantage.

If a suitable woods location is not available other freshly cleared land may be chosen or a site along some old hedgerow. In any case, however, it should be borne in mind that freedom from grass and weed seeds is an important consideration, unless these can be destroyed by thorough burning or steam sterilizing as explained under cigar Tobacco (page 13).



Suckering Test of Zimmer Spanish Tobacco. The Suckered Field on the Right Yielded 400 Lbs. more than the Unsuckered Field on the Left.
(From Bulletin 238, Ohio Experiment Station) Snow Type.



Suckering the Plants in the Field of Henry Sargeant, Broad Brook, Conn.

In the southern Tobacco districts, on account of the custom of making the plant bed in fresh land and the general practise of burning the land, plant bed diseases are less common than in cigar Tobacco districts. Nevertheless, they occur with greater frequency than is generally realized, and the grower should be on the watch for them, especially if he is accustomed to using the same bed year after year. To kill these disease germs unusually thorough, burning is necessary, or better still, the bed should be steam sterilized as described on page 13.

Area of Bed Required:

One hundred yards of bed, well set with good plants, will sometimes yield as many as 50,000 plants if drawn over three or four times at intervals of a few days in good growing weather, but it is not safe to count on more than about one fourth of this number. A conservative procedure is to estimate 100 square yards of bed for two and a half or three acres of Tobacco, but since a bed sometimes fails completely the area sowed should be in two or more separate beds, sowed, if not too late, a week or more apart.

Burning the Bed:

Custom in regard to burning varies in different localities. In some sections it is almost the universal practise to burn the bed either with brush or wood or by means of pan burners. In other sections many prepare the bed without burning. In general it is in the Tobacco districts where the soil is predominantly clayey that the custom of burning is most universal. Thorough burning kills weed seeds, disease germs and insects; puts the soil into better tilth (especially clayey soils); and the plants grow faster. A well burned bed is surer than an unburned one.

If plenty of good dry brush, not too coarse or sprangly, is available, it is most satisfactory for burning. It should be laid over the bed in straight well compacted windrows to a depth of 2 or 3 feet. It is well to lay green boughs over the brush and then a few poles or logs upon the brush to better compress the brush to the ground and confine the heat.

If wood is used, sufficient wood and kindling material (brush is good) is laid in a straight windrow along the upper side of the bed to burn 20 or 30 minutes, after which the half burned wood and embers are pulled by means of long handled hoes or hooks to the adjoining unburned strip below. Fresh wood is added as needed, generally each time the fires are pulled, and the process is repeated until the entire bed has been covered.

Damp litter should of course be raked off before placing the burning material on the bed, as it will keep the heat from effectively reaching the soil. The soil should be well heated and dried to a depth of one to two inches whatever the method of burning may be.

The preparation and burning of the bed can be done at any convenient time during the winter when the soil is not too saturated with water. When the soil is wet there is some danger of puddling it, and it takes more fire to burn effectively. The beds are often worked up and the seed sowed as soon as burned, but it is safer to delay seeding until about two weeks before the time the seeds should be coming up.

In preparation for the seed the embers and most of the ashes should be raked from the bed, and the soil fitted to a fine mellow tilth to a depth of 2 or 3 inches by suitable means such as coultering, harrowing, grubbing, and hand raking.



Two valuable recent discoveries as shown in Bulletin 239, Ohio Experiment Station:
 A—A Hybrid (199) showing 37 leaves.
 B—A Hybrid (257) that developed 43 leaves before showing buds. For further information, see the Bulletin.

Fertilizing the Plant Bed:

In order to do its best the bed must be made rich, and the most satisfactory manner of accomplishing this is by the liberal use of high grade Fertilizers. The plant-food in commercial Fertilizers is available, starts the young plant to growing early, and is free from objectionable weed seeds. The best results are obtained by using commercial Fertilizers at the rate of one to one and a half pound to the square yard. That is, for a bed containing 100 square yards from 100 to 150 pounds of high grade Fertilizers should be applied by raking in after the bed has been worked up just before seeding, and its most thorough incorporation with the soil of the plant bed is important.

Sowing the Seed:

The seed should not be sowed too thickly or a mat of spindling worthless plants may be the result. From one and a half to two tablespoonsfull of well cleaned seed is sufficient for 100 square yards of bed. Some good growers prefer to use but one moderately heaping spoonful to this area.

An even distribution of the seed is important, and to accomplish this thoroughly mix the seed for 100 square yards in about a peck of good sowing material such as dry ashes or Fertilizer. Mark off the bed both ways with lines made with a hoe handle into strips about 6 feet apart. Use these lines as guides for seeding and go over the bed both ways by distributing as evenly as possible.

As Tobacco seeds are very small they should not be raked in deeply but preferably merely compacted into the surface by tramping or other suitable means. Around the bed place 6 or 8 inch planks (poles or logs will do) fitting tightly so as to exclude insects which may do considerable damage, and of course the plant bed muslin should be fitted closely for the same reason, as well as to keep the bed warmer and protect the young plants on frosty nights.

The principal subsequent care of the bed consists in weeding if needed and, in the event of drought, it may be necessary to water the bed in order to have the plants ready in time. Choose a rainy spell for weeding, or thoroughly soak the bed artificially in order not to kill or stop the growth of the plants.

Preparation of the Field for Planting

A mellow friable soil well filled with vegetable matter is best for dark Tobacco, and the rotation should be arranged so as to maintain a plentiful supply. Dark Tobacco does well after grass or clover. The sod should be turned under in the fall or winter, leaving the field unharrowed, so that the repeated freezing and thawing may have its full effect in mellowing and improving the friability of the soil. This freezing and thawing is especially beneficial to the clayey soils to which, as a class, dark Tobacco lands belong.

In the spring thoroughly cut the soil to pieces with a disk harrow and put into a fine tilth before starting to lay off the rows in preparation for planting. Thorough work at this time is especially to be commended. No amount of cultivation after the crop is planted can fully make amends for previous shortcomings.



Charles Savage of South Deerfield, Mass. Inspecting the Growth of His Tobacco. V-C Used.



Geo. P. Smith of Sunderland, Mass. Studying the Possibilities of His Crop. V-C Used.



A Wonderful Growth of Tobacco, Aided by V-C, Though Started a Month Late. Farm of Julius Papp, Rockland, Conn.



20 Acres all Ready to Cut, on Farm of J. H. Collins, Andover, Mass. V-C Used.

Fertilization of Dark Tobacco

Proper and generous fertilization, as with other types, is one of the most important points in the production of a profitable crop of dark Tobacco, and the tendency is constantly toward the use of commercial Fertilizers in more and more liberal quantities. It is found that liberal fertilization not only increases the yield markedly but improves the quality and consequent price per pound as well.

The Tennessee Experiment Station as a result of its careful experiments, shows plainly that liberal fertilization is most profitable. In Bulletin No. 86 they report the sale of 887.6 pounds for \$108 from an acre fertilized with 750 pounds of commercial Fertilizers, and secured only \$21.24 for 212.4 pounds grown on an unfertilized acre. The same bulletin reports the sale of \$120 worth of Tobacco from an acre fertilized with 900 pounds of a complete Fertilizer, and only \$59 from the produce of an unfertilized acre. In still another test 800 pounds of Fertilizer produced a crop which sold for \$67.52, while an unfertilized acre produced a crop worth only \$31.76.

Similarly the Kentucky Experiment Station in Bulletin No. 139 gives the report of an experiment in Christian County in which commercial Fertilizers at the rate of 880 pounds per acre gave a yield of 1,284.3 pounds of Tobacco per acre against 689.6 pounds per acre from a plot immediately adjoining without any Fertilizer. The market value of this Fertilizer was \$15.84, and the Tobacco produced from it was worth \$121.56 per acre against a value of only \$67.82 per acre the average from the unfertilized plots.

Again, in Bulletin No. 199 the Kentucky Experiment Station gives the report of a careful experiment in Muhlenberg County in which the returns



Transplanting and watering tobacco seedlings by machine, a common method in parts of the Burley district and in nearly all the cigar-tobacco districts.

from a liberal application of commercial Fertilizers was 1,625 pounds per acre valued at \$116.82, while a plot without commercial Fertilizers yielded only 575 pounds of Tobacco per acre valued at \$18.20. The Fertilizers not only increased the yield about threefold but more than doubled the valuation per pound.

These results from such unprejudiced and expert authority show plainly the profitableness of applying commercial Fertilizers to Tobacco. In Bulletin No. 93, of the Tennessee Experiment Station, after drawing attention to the small quantity of Fertilizers used by many Tobacco growers, they say: "Such fertilization without doubt, pays well under the system of farming that has been described, but heavier applications would undoubtedly pay far better."

Setting Out the Crop

The great bulk of the Tobacco crop in western Kentucky and Tennessee is transplanted between May 10th and June 10th. The heaviest settings are generally in the latter part of May, although this depends largely on the plants and seasonal conditions.

When the plants are nearly ready the cloth cover should be removed to harden them, and the field prepared for receiving the Tobacco. For dark Tobacco the rows are laid off with a shovel plow or a small turning plow from 3½ to 4 feet apart, and it is a very common practice to check W rows running both ways. If checked it is customary to drop the Fertilizers at the intersection of the rows, but it would be better practice to use more Fertilizer as recommended by the Experiment Stations, and apply the larger part broadcast and harrow it in before laying off the rows. Small hills are made at the intersections of the check rows, or the entire row may be bedded by running two furrows with a one horse plow, the hills where the plants are to be set marked off by some suitable means. Check planting and cultivation is not feasible on very rolling land.

Moderate frequently repeated rains or showers are preferable to extremely heavy downpours at planting seasons, for the young plants live and grow off better. In setting the plants care should be taken to firm the soil around the roots at the bottom of the hole as well as at the top, and the plant should be set sufficiently deep so that the bud will be just above the surface of the soil. Cut worms can be controlled as explained under cigar Tobacco (page 24).

Cultivation of the Crop

Cultivation should begin as soon as the plants have become established and show signs of starting to grow, generally in about ten days or two weeks after transplanting. Care should be taken at the first cultivation not to loosen the roots of the plants, now only feebly established. The crust should be gently broken around each plant and a little fresh earth drawn to it. At the second cultivation, when the plant is thoroughly rooted, a good deep working with a double shovel plow is desirable. Later cultivations should be shallow but frequent in order to keep the surface crust broken but not to injure the roots as they spread across the rows. The high bed is not desirable, but at each cultivation it is beneficial to work a little fresh soil toward the plants.

Topping and Suckering

As explained under cigar Tobacco the natural purpose of the plant is to produce seed, but the leaves will develop better if this be prevented by breaking out the flower bud or button, as it is called, and thus force all the energies of the plant into leaf production. In dark Tobacco large heavy leaves are desired. The plant should therefore be topped early, as soon as the desired number of leaves have appeared, even though the bud is not yet visible. Usually from 10 to 14 leaves are left to mature, depending on the size and vigor of the plant, as some plants will properly mature more leaves than others. Later plants are topped somewhat lower than the earlier ones in order to hasten maturity and bring the entire field into condition for harvesting more nearly at the same time.

The suckers that grow out from the axils of the leaves, after the plants are topped, should be kept closely broken out; going over the field every week or oftener is needed. They are best removed when not more than these or four inches long.

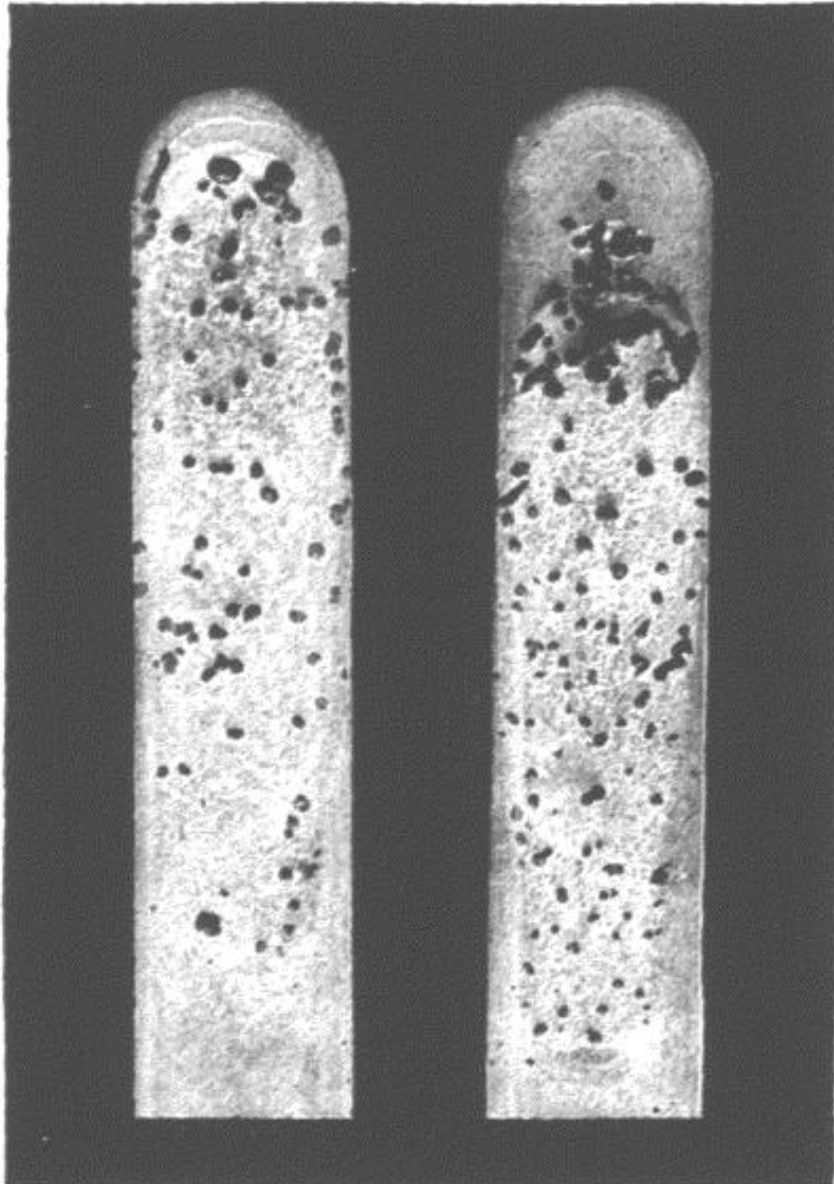
Combatting Horn Worms

In August and September these pests are often so numerous as to completely defy attempts at keeping them in control by hand picking—an expensive and tedious undertaking. The best way is to poison them with Paris Green or Arsenate of Lead. The latter is somewhat more expensive but it sticks better, not being so readily washed off the leaves by heavy rains as Paris Green, and is much less likely to burn the leaves. In fact Paris Green is almost sure to burn the leaves if the Tobacco has begun to “grain up” as it approaches maturity, therefore, the Arsenate of Lead is



Mr. Louis Veengat, Horse Cave, Ky. I used V. C. Fertilizer 2-8-5 under my tobacco this year and am more than pleased with results.

much to be preferred for these reasons. Either material may be readily applied dry with a dust gun, but the Arsenate of Lead requires a special type of gun in order not to clog. A successful gun for this purpose is that manufactured especially for Arsenate of Lead by the Tow-Lemons Company, Cedar Hill, Tennessee. This method of combatting the Horn Worm is recommended by Experiment Stations and the U. S. Department of Agriculture.



Sclerotial stage of sclerotinia, sp. causing damping off of tobacco seedlings.

Harvesting and Curing Dark Tobacco

If favorable weather conditions prevail dark Tobacco will be ready for the knife in about 30 to 40 days after topping. The general appearance of the field changes from a dark green to a lighter shade, and the leaves turn under slightly at the edges. Yellowish spots fleck the leaves and the surface is somewhat crinkly or cupped with little depressions. If the leaf surface between the veins be grasped with the thumb and finger so as to fold it sharply back it will crack. These are among the more important signs that tell the experienced grower that the Tobacco is ripe and ready for the knife.

Right Time and How:

Harvesting at the right time is one of the most important points affecting the quality of the cured product. If overripe it will be lacking in elasticity, oil, and lustre. If under ripe the leaf will lack weight and body and the colors will be dingy or muddy instead of a clear brown. Dark Tobacco is harvested by splitting the stalk from the top down to within 4 or 5 inches of the place, just below the bottom leaf, where it is to be severed from the ground. It is hung on the stick by inverting the plant and straddling the cleft over the stick. The sticks are generally cut 4½ feet long so as to fit between and rest on the poles in the barn which are 4 feet apart. About eight plants is the usual number to each stick, but if the Tobacco is large, six will be enough, or if small ten or more may not be too many. It should not be spaced so closely as to crowd and clog, thus preventing proper circulation of the air during curing, or "house burn" may result.

Avoid Sunburn:

It is desirable for the Tobacco to remain on the ground after cutting long enough to wilt thoroughly, so that it can be hauled and otherwise handled to better advantage without breaking the leaves. In hot weather, especially around the middle of the day with a bright sun, it should be remembered that the Tobacco will sometimes sunburn in 20 or 30 minutes. No more serious damage can happen to Tobacco—the sunburn areas being practically worthless. The Tobacco should be turned over, piled, scaffolded, or hauled to the barn before this happens. It is often convenient to hang the Tobacco on a scaffold erected in the field for 3 or 4 days before hauling to the barn.

It is best not to commence cutting in the morning until the dew is well off, and all Tobacco should be gotten up from the ground at night. In the earlier part of the harvest season it may be advisable to leave underripe plants standing for a later cutting if there is any considerable proportion of the plants not sufficiently mature for satisfactory results.

Proper Spacing in Barn:

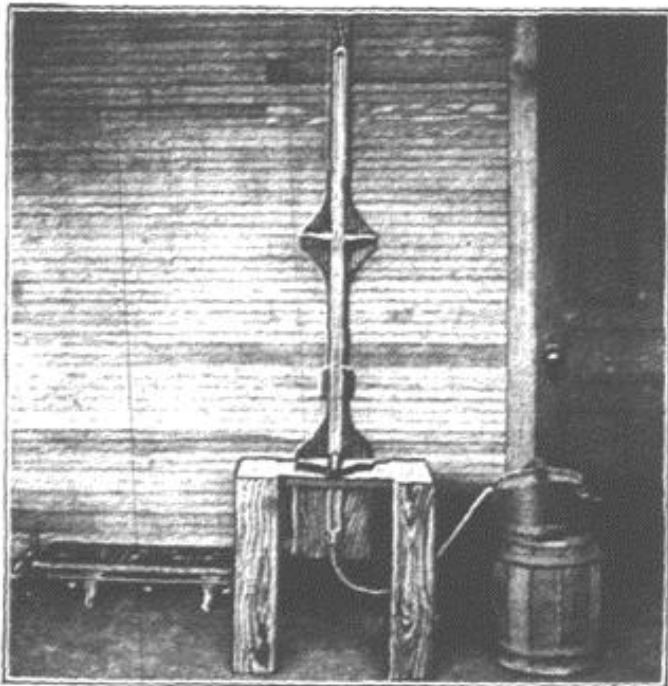
In spacing in the barn allow sufficient distance between the sticks to permit of ready air movement up through. About 6 inches is the more common distance allowed between sticks, but if the Tobacco is large and sappy a greater distance may be necessary. If the Tobacco has been thoroughly wilted by hanging on the scaffold, or if the weather is cool and dry it can be spaced closer than if placed directly in the barn, especially if in muggy weather, although Tobacco cures better in warm than in cool weather, if not too crowded in the barn. It is difficult to yellow Tobacco properly in cool weather, and if fires are resorted to in yellowing, it is likely to dry up green before the proper color changes have had a chance to take place. For this reason early or moderately early Tobacco is likely to give better results than late Tobacco.

Proper Temperature Important:

Dark Tobacco does best if it yellows rather slowly, and for this reason it is not customary to start fires in the barn before the fourth or fifth day after harvesting. Even then only moderate heat is desired, enough only to hasten the yellowing and start a circulation of air through the Tobacco to dry off the surplus moisture and prevent "house burning." After being started the fires may be maintained continuously for several days or until the Tobacco is pretty well dried out, but only moderate temperatures should be permitted (90 to 100 degrees) until the green has pretty thoroughly disappeared from the leaf. After this a temperature of 120 to 130 degrees will hasten the cure and do no harm. Equally satisfactory results can be

obtained often more satisfactorily, if the fires are maintained for only a day at a time—sufficient to protect the Tobacco from "house burn," and then after two or three days, preferably during damp weather, fire again for a day and dry out moderately. Even after the Tobacco is thoroughly cured it is often necessary, during periods of damp weather, to build up fires for a few hours to dry the Tobacco to prevent mould or other damage from developing.

Oak or hickory is preferable for open fire curing, and it is better if only partly seasoned—enough to hold fire well. The vapor from such wood gives a better cure by preventing too rapid drying. The smoke from the open fires adds a desirable flavor to this type of Tobacco and renders it less likely to damage from mould or decay.



Seed separator in position and apparatus for heating water for use in fermentation work. Bulletin 238, Ohio Experiment Station.

Other Types of Dark Western Tobacco

The Western dark Tobacco crop aggregates each year something like 225,000,000 pounds. Of this total some 60,000,000 pounds consisting principally of the Green River, Southern Kentucky and upper Cumberland types are air cured. The methods of producing these air cured types are similar to those described above for the fired types.

In the Upper Green River and Upper Cumberland Districts much One Sucker Tobacco is grown; this sort has a long narrow leaf suitable for the African trade where length of leaf is one of the most important requisites. In the fire cured districts and in the Lower Green River Districts the large broad leaf varieties of the Pryor type are most generally grown.

The air cured Tobacco is harvested by splitting the stalk as in the dark fired districts, but it is air cured substantially as described under cigar Tobacco (page 31).

Preparing Dark Tobacco for Market

After the Tobacco is thoroughly cured, stalk and stem, it may be taken down whenever it is in sufficient order not to break in handling. It should be neatly bulked down and covered so that it will not dry out preparatory to stripping from the stalk and grading. In grading dark Tobacco any given crop will usually fall into about three grades. Beginning at the bottom of the plant there will be two or three trashy leaves for the lug grade, and the remaining leaves will generally be divided between the grades known as short and long leaf.

The leaves of the leaf grades are tied into bundles of 8 to 12 leaves each. The lugs are tied in somewhat larger bundles. These bundles are tied by wrapping a leaf around the butt of the bundle beginning with the tip of the tie leaf. This is done deftly by experienced hands with a knack difficult to describe in detail.

This work of preparing the Tobacco for market is performed at available times during the late fall and winter months. The Tobacco should be neatly handled by keeping the leaves and bundles well straightened out. It should not be allowed to dry out completely nor kept for any length of time in high order, especially if in bulk, or it may damage from mould or from heating. If in soft order the Tobacco should be examined every few days, especially in warm weather, and at the first appearance of heat or mould it should be well aired and dried out if necessary. Dark Tobacco is sold largely by sample, and the care taken in handling has considerable influence on the price.

Methods of cultivation, curing, and handling Western dark Tobacco is in the main quite similar to the methods followed by the Virginia growers in the dark Tobacco districts of that State. Western darks as a class are somewhat darker and heavier than Virginia darks, but in the main they fill the same trade requirements with varying proportions of the different grades from the various sections.

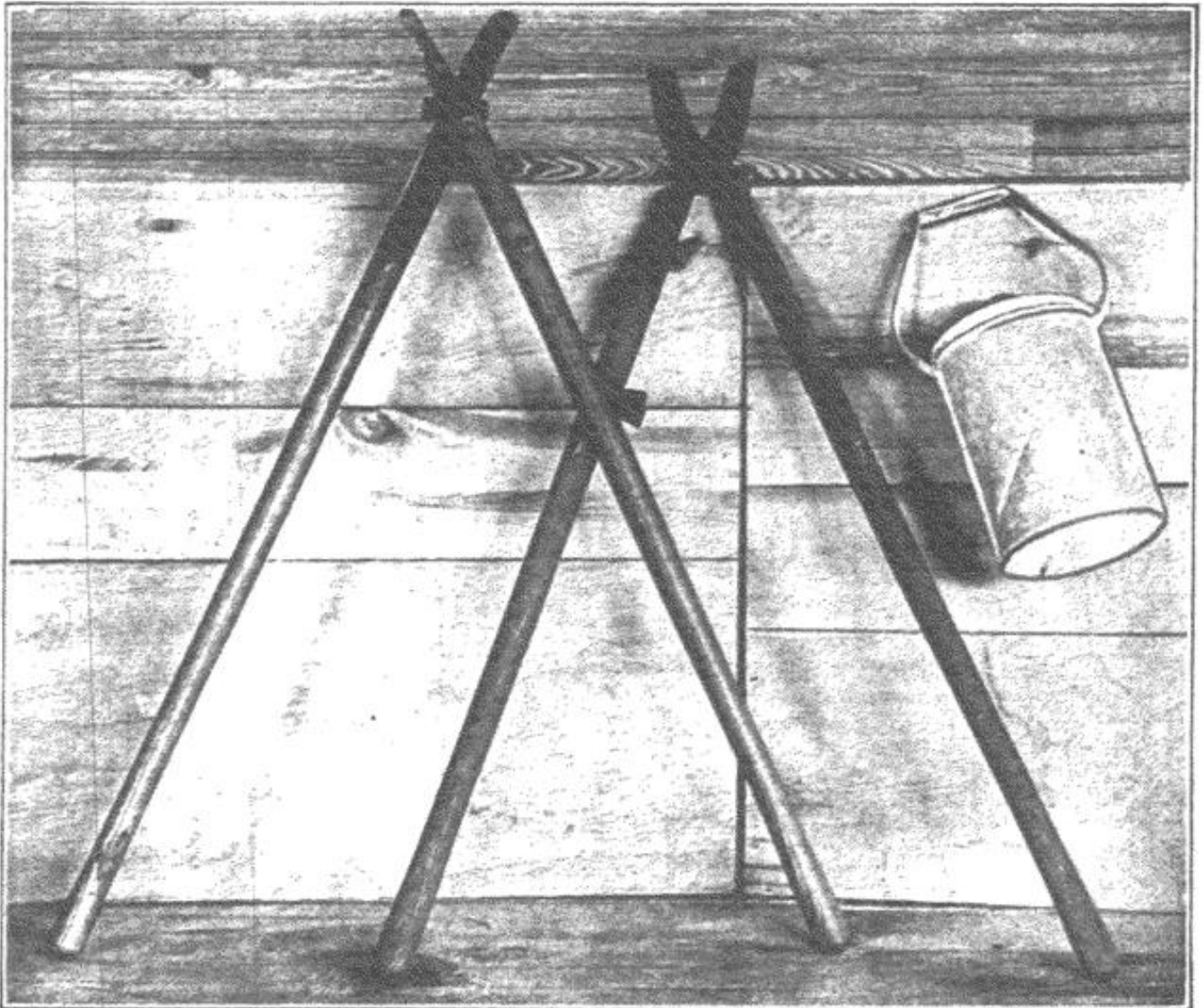
Uses and Classification of Dark Tobacco

The greater part of dark Western Tobacco is exported. England, Germany, Austria, Italy, France, and Spain are the principal consumers of these types. Snuff is the most important use in domestic consumption for the fire cured; and of the air cured sorts considerable quantities are manufactured into twist, smoking Tobacco, and plug.

Dark Export Tobacco Classifications:

In a general way the following classifications apply to the export Tobaccos: The English market takes grades varying in color from a bright red to a dark brown. The German market in former years preferred an article varying from a chocolate to a full brown color, rich and oily, of good body and strong elastic texture. In later years there has been a growing demand for brighter colors. A strong, elastic texture is required for the English and German spinners, as the Tobacco is twisted into a long coil after the fashion of a rope.

The Italian (Regie Market) takes grades ranging from a cherry red to a deep brown color, the better grades having a smooth silky finish. The scale of qualities is represented alphabetically. A, refers to be best grade and consists of a leaf from 25 to 26 inches long and of fine texture and fibre. This type is used largely for cigar wrappers. Grade B and C measure from 22 to 25 inches and from 18 to 22 inches, respectively, and approach the quality of A as nearly as possible. These Tobaccos are utilized by the Italian Government mainly for cigars.



Types of shears for cutting Tobacco and bucket shaker for dusting mixture of lime and Paris Green. Shears on right old style, with double blades. Shear on left is new style, which can be reversed and allow cutter to throw leaf in any direction. Bulletin 238, Ohio Experiment Station.

The types exported to Austria are regarded as of a higher class than the Italian, and consist of grades of lighter shades of color. The Austrian type lacks the body of the Italian, but possesses superior finish and silkiness.

The wrapper demanded by the Swiss, which measures from 25 to 30 inches, is usually regarded as the highest development of the Austrian type.

The French and Spanish trades require the extreme of the light-bodied Tobaccos. The better French classes command a very good price, while the Spanish is cheap, nondescript Tobaccos.

The type of Tobacco required in Africa consists of a very long narrow leaf with plenty of body but coarse fibre and grain. Finish and quality are not considered. Tobacco for this trade is usually called "balers."



Farmers' Tobacco Warehouse,

Cultivation of Burley Tobacco

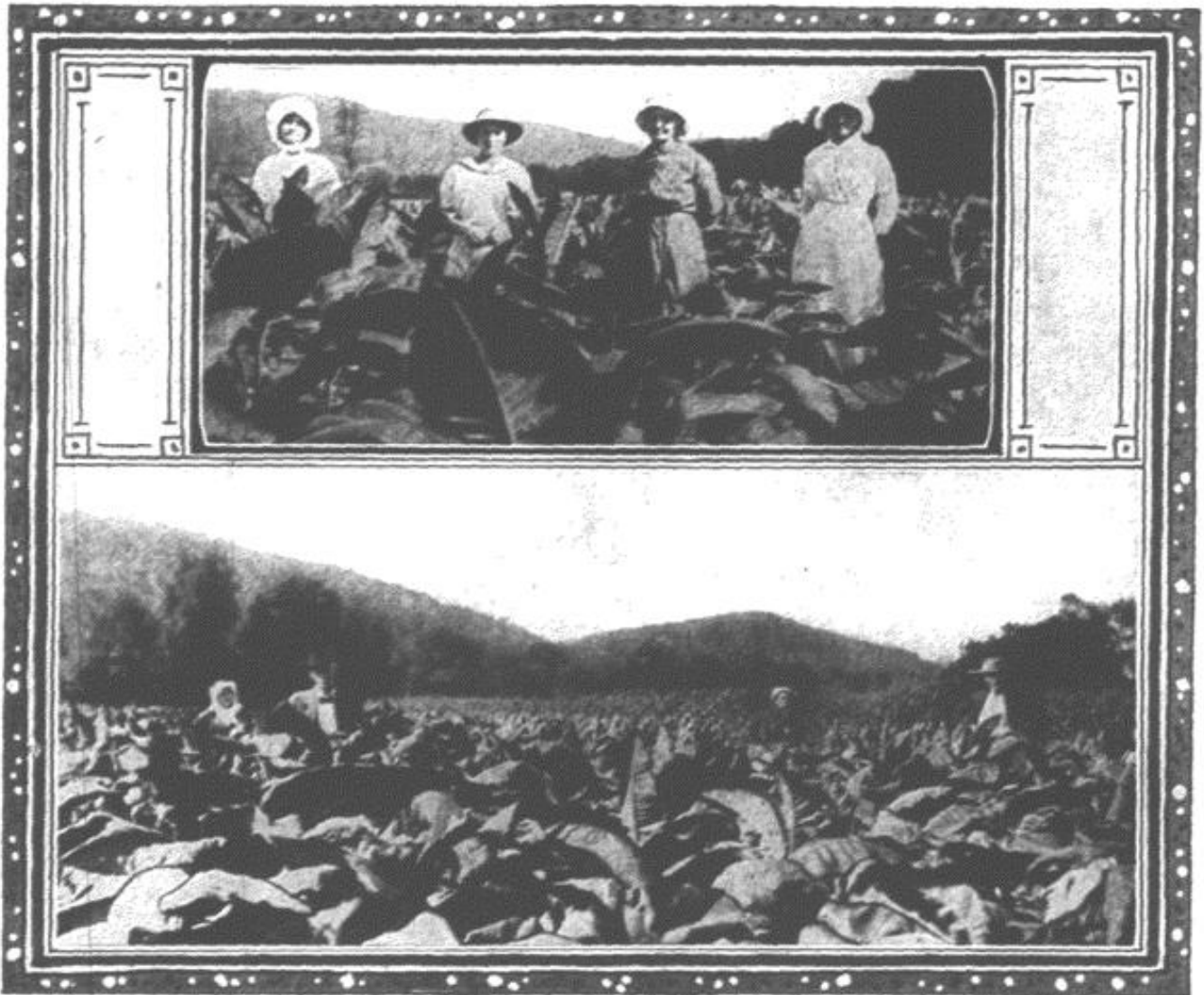
White Burley Tobacco has had a wonderful development since its beginnings about fifty years ago. Today there is probably more Burley used in domestic consumption than any other type. Only relatively small quantities of Burley are exported. It is adapted particularly to the phosphatic limestone soils of central Kentucky and adjoining sections of southern Ohio, West Virginia, Indiana, and Tennessee.

Seed Beds:

Seed beds are burned and prepared about as described for dark Tobacco, (page 41), except that woods located are often unavailable in some sections. Very good results are obtained if the bed is made along the edge of an old pasture that has laid long in blue grass. Such beds are usually laid off about 6 feet wide. Wood being scarce in some sections pan burners are often utilized in burning, or steam sterilization by the inverted pan system, as described under cigar Tobacco, (page 13) is an excellent method answering both to take the place of burning and sterilizing which latter is often needed in the Burley district.

Soil Preparation and Fertilization:

The soil of the seed bed should be made very rich by the use of commercial Fertilizers because these are readily available and do not fill the soil with weed seeds as manure is likely to do. As with other types thorough preparation and fitting of the soil before planting is an important point in the profitable production of Burley Tobacco. Whenever practicable the soil should be fall or winter plowed, especially if a grass sod is to be turned under.



Mr. J. R. Walsh, Otway, Ohio, says: "I sold the crop of $6\frac{1}{2}$ acres for \$2,627.95. This tobacco was of the White Burley variety raised on land that had been in corn the previous year. I used V-C 16 per cent. Acid Phosphate, 500 pounds to the acre drilled in with a wheat drill."

The use of commercial Fertilizers is also receiving more and more favorable attention in the Burley district, as their liberal use has been found to be very profitable. Bulletin No. 45 of the Kentucky Experiment Station, which is situated at Lexington in the centre of the richest part of the blue grass section, reports the results of an experiment with Burley Tobacco in which the plot without Fertilizer yielded 460 pounds of Tobacco per acre worth \$25.20, while an adjoining plot fertilized with 320 pounds per acre of commercial Fertilizer yielded 1,280 pounds of Tobacco worth

\$108.80; on another plot receiving 920 pounds of Fertilizer per acre the yield was 1,620 pounds of Tobacco per acre worth \$142.80. the cost of the Fertilizers per acre in this case was \$21.82 and in the former \$7.96. Such absolute evidence as this should convince every Tobacco grower as to the value of applying commercial Fertilizers in abundance on his crops.

Transplanting Burley Tobacco:

Two horse machine transplanters are being used to a considerable extent in setting out Tobacco, especially in the smoother sections of the Burley district. They are entirely successful and the plants live even better than when transplanted by hand.

Distance of Setting:

Light colors and rather a thin leaf are desired in Burley Tobacco, and rather close planting helps to attain this. The more usual distance between the rows is about $3\frac{1}{2}$ feet, although there are variations from 3 to as much as 4 feet. Between the plants in the rows the distance varies from 16 to 20 inches. The plants are set closest on the richer lands so as to keep the Tobacco from growing dark and coarse.

Height of Topping:

Burley is topped higher than dark Tobacco. Usually 16 to 18 leaves are left, but this varies from 12 or 14 up to 20 or more according to the vigor and size of the plant at topping time. It should be topped as soon as the bud or button comes out, and after topping the plants should be regularly suckered as described under dark Tobacco (page 45).

Harvesting and Curing:

Under average weather conditions Burley Tobacco will be ready for harvesting about 30 days after topping. Ripeness is indicated as in other types by yellow spots and by brittleness when the leaf is bent sharply back on itself, but experience and judgment are necessary to determine just the right condition for harvesting.

Burley Tobacco is harvested by splitting the stalk and straddling on the stick as described for dark Tobacco (page 47). If the Tobacco is large six plants to the stick is enough. It should be wilted thoroughly before hauling to the barn, and it may be scaffolded in the field for 3 or 4 days before hauling if convenience demands. Somewhat closer spacing in the barn is permissible if it is thus scaffolded and the danger from house burning is to some extent diminished.

Burley is air cured in the same manner as described for curing cigar Tobacco (page 31). Plenty of space should be given in hanging the Tobacco in the barn—generally about 10 or 12 inches is allowed between the sticks, and the barn should be amply provided with ventilators which should be managed according to the principles described under cigar Tobacco. In warm damp weather, continued for several days, there is danger of house burning, a condition similar to pole sweating described under cigar Tobacco, and it is combatted by the same methods. It greatly injures the Tobacco by blackening it and taking all the life and oil out of the leaf.

Stripping and Preparing Burley Tobacco for Market:

In 6 to 8 weeks after cutting, the Tobacco will usually be completely cured, after which it may be taken down for stripping whenever it is in sufficiently good order to be handled without breaking.

In grading a crop there will generally be at least six grades. From the bottom of each plant there will be 2 or 3 very poor trashy ground leaves called flyings; above these there will be a few leaves to go into what are designated the trash grade; then comes a grade of somewhat better body but not equal to the leaf known as lugs. At the top of the plant there will be about 2 leaves called tips, either green or red, while from the middle of the plant will come the red or colory leaf grades. Damaged leaf would of course fall into still other grades.

The trash and lug grades generally bring the highest price because of their brighter color and superior absorbtive capacity. Burley is tied into bundles or hands with a leaf as described for dark Tobacco, and is principally sold piled in baskets on the loose leaf warehouse floor.

Since Burley is an air cured Tobacco it is more readily attacked by mould than fired Tobacco, and requires close watching when in soft order in warm weather.

Uses of Burley Tobacco:

The great bulk of Burley is used in domestic consumption. The bright trash and lug grades are used extensively in the manufacture of cut plug smoking Tobacco. Some of the finest colory leaf is used for cigarette wrappers. The larger proportion of the leaf grades are used in the manufacture of sweet plug, twist, and fine-cut.

Burley Tobacco has the highest absorbtive capacity for liquid flavoring materials of any Tobacco known, which is one of its strongest points of usefulness in the Tobacco trade.

The Tobacco Brands of V-C Fertilizers Preferred

There is perhaps no other farm crop that yields bigger returns from superior skill and knowledge than Tobacco. One of the most important points upon which the highest success depends is the discriminating and liberal use of high grade commercial Fertilizers, which is now recognized by a great many Tobacco growers.

V-C Fertilizer Tobacco Brands are prepared with special reference to the peculiar needs of the Tobacco plant. Equipped with one of the most extensive and elaborate laboratories, the company's experts constantly make a careful study of Government and State experiments and reports, which are supplemented by close observations as to actual results produced on the fields in the various Tobacco growing districts. As a result of this constant study and observations many thousands of Tobacco growers recognize the advantage of using the special Tobacco Brands of V-C Fertilizers on their Tobacco crops.

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V-C GOOD FOR HAVANA TOBACCO:

"I have used V-C Fertilizer on a crop of Havana Tobacco applied at the rate of one ton of 2,000 lbs. per acre with stable manure and obtained a yield of 1,950 lbs. per acre of fine quality and sold same at a very good price.

F. M. HILLS, Glastonbury, Conn.

V-C A GOOD SOIL BUILDER:

"We used V-C National Tobacco Manure, 150 lbs. per acre, on very thin land, making 1,500 lbs. fine Burley tobacco per acre, also fertilized our corn with V-C Sure Grain Producer, 150 lbs. per acre, making 65 bushels of corn per acre on very poor soil that had been run down for many years."

TAYLOR DOWELL, Irvington, Ky.

BEST CROP IN THE COUNTY:

"I have been using V-C Fertilizers for several years. I think it is the best I have ever used. People say I have the best tobacco crop in the county."

C. W. Mangum, Rt. 2, Madisonville, Ky.

1800 POUNDS OF FINE TOBACCO PER ACRE:

"I used 400 lbs. V-C Fertilizers per acre on 8 acres which yielded 1,800 lbs. per acre of fine tobacco."

JOSEPH P. LUTZ, R. F. D. No. 1, Union, O.

YIELDED NICE TOBACCO:

"I used 400 lbs. V-C Fertilizers, 2-8-3, per acre on an 8-acre piece, which yielded 1,800 pounds of nice tobacco per acre."

JOSEPH P. LUTZ, R. F. D. No. 1, Union, O.

USED 3500 POUNDS OF V-C PER ACRE:

"We used 3,500 lbs. of V-C Fertilizers per acre, and got a yield of 1,800 lbs. of tobacco per acre."

MULCAHAY BROS., Hellstown, Ct.

6000 POUNDS OF TOBACCO ON THREE AND ONE-HALF ACRES:

"I used about 2,000 lbs. of V-C Fertilizers to the acre and on three and one-half acres produced three tons of highest quality tobacco. I had equally as good results from V-C on all my other crops and in the future shall use V-C exclusively."

THOMAS D. COLEMAN, Manchester Green, Conn.

GOOD YIELD WITH V-C IN SPITE OF WET SEASON:

"I used between 3,500 and 3,800 pounds of V-C Fertilizers per acre, and yielded 1,605 pounds of tobacco per acre, which was very good owing to the wet season."

J. H. COLLINS, Amherst, Mass.

WILL USE V-C AGAIN THIS YEAR:

"I used 3,000 pounds of V-C Fertilizers per acre and realized about 15,000 pounds of tobacco per acre. Have already placed my order for V-C next season."

EDMUND A. FOX, Glastonburg, Conn.

FINE QUALITY TOBACCO FROM V-C:

"I used V-C Fertilizers with stable manure last year and when I used the two together I applied one ton of V-C and five loads of manure to the acre, when I used V-C alone the amount applied was 3,000 pounds per acre. The yield in each case was 1,800 pounds of fine quality tobacco per acre."

C. O. WALCOTT, Buckland, Conn.

V-C GIVES FINE RESULTS:

"I used 30,000 pounds of V-C per acre and the growth was equal to 1,800 pounds. Your goods give fine results here."

CHAS. E. ANDREWS, Glastonburg, Conn.

16,081 POUNDS OF TOBACCO FROM 8 V-C'D ACRES:

"On eight acres, which were fertilized with V-C Fertilizers at the rate of 3,000 pounds to the acre, I received a yield of 16,081 pounds of good quality tobacco. Was very well satisfied and have ordered my V-C for next season."

A. M. GRIFFIN, Granby, Conn.

GLADLY RECOMMENDS V-C TO TOBACCO GROWERS:

"I used V-C Fertilizers with satisfaction and would gladly recommend it to tobacco growers."

SAMUEL GRAHAM, West Suffield, Conn.

WILL USE 18 TONS OF V-C NEXT YEAR:

"I used about 3,500 lbs. per acre of V-C Fertilizers and received a yield of 1,800 lbs. of fine tobacco. I value V-C Fertilizers so highly that I have placed an order for 18 tons of V-C for next year."

A. M. BIDWELL, Glastonbury, Conn.

USED 3,500 POUNDS OF V-C PER ACRE:

"We used 3,500 lbs. of V-C Fertilizers per acre, and got a yield of 1,800 lbs. of tobacco per acre."

MULCAHAY BROS., Hellstown, Ct.

6000 POUNDS OF TOBACCO ON THREE AND ONE-HALF ACRES:

"I used about 2,000 lbs. of V-C Fertilizers to the acre and on three and one-half acres produced three tons of highest quality tobacco. I had equally as good results from V-C on all my other crops, and in the future shall use V-C exclusively."

THOMAS D. COLEMAN, Manchester Green, Conn.

V-C PRODUCED GOOD CROP:

"The Tobacco Fertilizer I bought of you was in good mechanical condition, and produced a very good crop of tobacco."

R. L. COOK, Hadley, Mass.

USED V-C—HAD BEST CROP EVER RAISED:

"We have always obtained first-class results from V-C Fertilizers. We believe that V-C Fertilizers is the most uniform fertilizers we have ever used, and did not grow anything without V-C Fertilizers."

M. J. AND J. F. MULCAHAY, Hellstown, Conn.

V-C BEST OF MANY:

"I have used many brands of fertilizers, and V-C is the very best I have ever used. It raised a very fine leaf and produced a large percentage of wrappers."

WM. C. MULCAHAY, Glastonbury, Conn.

BEST CROP EVER SEEN:

"I used V-C Fertilizers in connection with manure, and had a very fine crop of tobacco. The growth was good and quality excellent. Several good judges of tobacco told me it was the finest they had ever seen. I used V-C with two per cent. potash."

JAMES W. BANCROFT, Glastonbury, Conn.

V-C IS THE STUFF:

"Find enclosed snap shot of this season's tobacco. V-C is the stuff. Tobacco in this picture will run 1,800 pounds to acre in old land."

JOHN E. FARRELL, Warehouse Point, Conn.

RECOMMENDS V-C TO HIS NEIGHBORS:

"I have been using V-C Fertilizers for the past three years, and can safely say that it is the best on the market. Last year I had the heaviest and best tobacco in this section, due to the use of your fertilizer. I also use it on my corn and vegetables, and find it equally satisfactory. I have advised my neighbors to use it, and they have done so with fine results. I shall use it exclusively in the future."

THOS. D. COLEMAN, Manchester Green, Conn.

GETS HIS MONEYS WORTH:

"I can gladly say that for the past four years I have used no other fertilizers but V-C on my Connecticut farm for tobacco, grass and corn. Without any doubt, it is the best commercial fertilizer now on the market. It produces the yield and quality, and a farmer gets his money's worth when he buys V-C Fertilizers."

W. H. HINSON, Grower and Packer, Connecticut Tobacco, Hinson, Fla.

GOOD RESULTS:

"I used V-C Fertilizers for tobacco in 1916 with good results. We had better than average growth for the season, which was unfavorable for tobacco in New England."

GEO. P. SMITH, Sunderland, Mass.

V-C STANDS THE TEST:

"I have used V-C Fertilizers several years, have tested them beside other standard goods, and find V-C gives best results. I am now using V-C exclusively. The last two years have had tobacco crops that I feel justly proud of, and feel justified in recommending V-C Fertilizers to others."

CHAS. O. WALCOTT, Buckland, Conn.

V-C PRODUCES BANNER CROPS:

"I have used V-C Fertilizers for the past two years, and the tobacco has been pronounced a banner crop both years. Shall use it this coming year, as it produces extra quality of leaf."

M. R. CASE, Cranby, Conn.

V-C BEST FOR TOBACCO:

"I have used V-C Fertilizers for tobacco with excellent results. I believe it to be the very best tobacco fertilizer on the market."

F. D. HUBBARD, Sunderland, Mass.

WILL USE V-C NEXT YEAR:

"We think V-C Fertilizers are very good. We have used them this year, and the tobacco is standing very good, about the same as last year. We will order your fertilizers for next year."

PAUL FRENZEL, Broad Brook, Conn.

V-C FERTILIZERS A SUCCESS:

"I have been using and selling different brands of fertilizers for fifteen years. In justice to V-C Fertilizers must say it has given me and my customers more dollars in return for the amount invested than any fertilizer we have ever used."

TICE McCOY, McCoy, Ky.

WELL PLEASED WITH V-C:

"We have used and sold many different brands of fertilizer, but for the past few years have been using exclusively V-C Fertilizers on corn and wheat at the rate of 150 to 200 lbs. per acre—V-C 16% Acid Phosphate. Am well pleased with V-C Fertilizers.

O. L. ROBINSON, Short Creek, Ky.

V-C ALWAYS PROVED THE BEST:

"We have been using V-C Fertilizers for 18 years and during that time have tried many different brands of fertilizer but V-C Fertilizers have always proven the best, and for the past few years have used it exclusively. This season we used 200 lbs. of V-C per acre on tobacco, making 1,600 lbs. per acre of high grade tobacco. We also fertilized our corn with V-C 16% Acid Phosphate, 200 lbs. per acre, making 75 bushels of corn per acre. We are always glad to speak a good word for V-C Fertilizers."

W. G. HAYDEN, Livia, Ky.

CAN RECOMMEND V-C:

"I have used V-C Fertilizers with satisfactory results, and would gladly recommend it to tobacco growers."

SAMUEL A. GRAHAM, West Suffield, Conn.

V-C PRODUCES FINE TEXTURE:

"I used a carload of V-C Tobacco and Onion Fertilizers last season, and was more than pleased with the results, good growth and color, and fine texture."

FRANCIS S. REYNOLDS, 36 N. West St., Hadley, Mass.

WONDERFUL RETURN:

"On five acres of tobacco last year grown on V-C Fertilizers we applied 4,000 lbs. of fertilizer per acre, and we got 2,000 lbs. of tobacco per acre. It was a large yield of fine, silky, light colored leaves and the burn was perfect."

PAUL FRENZEL, Broad Brook, Conn.

List of Free V-C Crop Books

EVERY land owner and farmer will find these illustrated Free Crop Books of intense practical value, for they point the way to greater Prosperity on the farm, which means "increased yields per acre" and *better* crops.

The following list of Crops shows how extensively these Books cover every crop that may be profitably grown in the South. If you are interested in one or more of these, fill out the Free Coupon on the opposite page:

Alfalfa	Garlic	Peas
Apples	Grape Fruit	Peppers
Apricots	Grapes	Pineapples
Artichokes	Grasses	Plums
Asparagus	Green Corn	Potatoes (Irish)
Barley	Hay	Potatoes (Sweet)
Beans	Hot Beds	Pumpkins
Beets	Irish Potatoes	Radishes
Berries	Leek	Raspberries
Blackberries	Lemons	Rice
Cabbage	Lettuce	Rye
Cantaloupe	Melons	Shallot
Carrots	Millet	Snap Beans
Cauliflower	Nectarines	Sorghum
Celery	Nuts	Spinach
Cherries	Oats	Squashes
Clover	Okra	Strawberries
Corn (Green)	Onions	Sugar Cane
Corn (Fodder)	Oranges	Sweet Potatoes
Cotton	Orchards	Tobacco
Cowpeas	Parsnips	Tomatoes
Cucumbers	Parsley	Trucks
Dewberries	Pecans	Turnips
Egg Plant	Peaches	Vegetables
Frames (Cold)	Pears	Watermelons
Fruits	Peanuts	Wheat

BY SIMPLY placing check marks (✓) on the Free Coupon below in the square opposite such books as you may want, and then mailing this Coupon to the address below, after also indicating the number of acres you will plant and cultivate, such Books as you have indicated will be sent you *free* without any obligation on your part. *Address:*

CROP BOOK DEPARTMENT

V-C Fertilizers

Box 1616

RICHMOND, VA.

CUT ALONG THIS LINE

FREE V-C CROP BOOK COUPON

Please send me Free Crop Books as per my check marks (✓) in squares below. The number of acres of these crops I will plant and cultivate are:

- | | |
|--|--|
| <input type="checkbox"/> ALFALFA.....acres | <input type="checkbox"/> MILLET.....acres |
| <input type="checkbox"/> BARLEY.....acres | <input type="checkbox"/> NUTS.....acres |
| <input type="checkbox"/> BERRIES.....acres | <input type="checkbox"/> OATS.....acres |
| <input type="checkbox"/> CITRUS FRUITS.....
<small>acres or trees</small> | <input type="checkbox"/> RICE.....acres |
| <input type="checkbox"/> CLOVER.....acres | <input type="checkbox"/> RYE.....acres |
| <input type="checkbox"/> CORN.....acres | <input type="checkbox"/> SORGHUM.....acres |
| <input type="checkbox"/> COTTON.....acres | <input type="checkbox"/> STRAWBERRIES...acres |
| <input type="checkbox"/> FLORIDA TRUCKS.acres | <input type="checkbox"/> SUGAR CANE.....acres |
| <input type="checkbox"/> FLOWERS.....acres | <input type="checkbox"/> TOBACCO.....acres |
| <input type="checkbox"/> FRUITS.....
<small>acres or trees</small> | <input type="checkbox"/> TREES (SHADE)...acres |
| <input type="checkbox"/> GRASSES (LAWN)..acres | <input type="checkbox"/> VEGETABLES.....acres |
| <input type="checkbox"/> HAY.....acres | <input type="checkbox"/> WHEAT.....acres |

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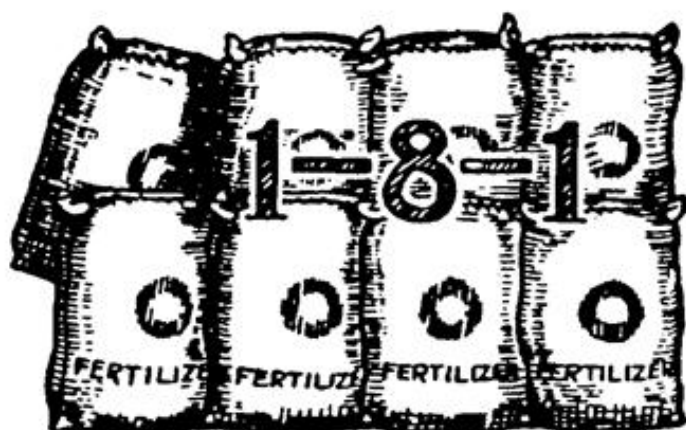
Dealer_____

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Fertilizers of High Grade Analyses Save Time, Material, Labor and Money

Low Analysis



High Analysis



THESE two piles of fertilizer—eight bags on the left, five bags on the right—contain exactly the same amounts of plantfood.

High analysis fertilizer saves three-eighths, or more of the *freight cost*—freight on five tons or less, instead of on eight tons.

High analysis fertilizer saves three-eighths, or more of the *hauling costs*—five trips to the warehouse instead of eight or more.

High analysis fertilizer saves three-eighths, or more of the bag costs—five bags instead of eight.

Finally, high analysis fertilizer saves at least three-eighths of storage costs.

Why not get the most for your money?

Save Money in Buying Fertilizer—Order Analysis Containing Fourteen percent. or over of Plantfood

TOBACCO

V-C Fertilizers

1600 Pounds Fine Burley Per Acre

Beauchamp Bros., Falls of Rough, Ky., state: "We used V-C Fertilizers on our Tobacco land at the rate of 200 pounds per acre, and made a very fine quality of Burley Tobacco. We think our crop will average 1600 pounds per acre. We also fertilized our corn with V-C, and are well pleased with results; have a big corn crop. V-C Fertilizers are big crop producers."

Frances S. Reynolds,
36 N. West Street,
Hadley, Mass.,
writes:

"I used a car-load of V-C Tobacco Fertilizers last season and was more than pleased with the results, good growth and color, and fine texture."

FOR SALE BY