DOMINION OF CANADA

DEPARTMENT OF AGRICULTURE

DOMINION EXPERIMENTAL FARMS

EXPERIMENTAL STATION

L'ASSOMPTION, P.Q.

REPORT OF THE SUPERINTENDENT

J. E. MONTREUIL, B.A., B.S.A.

FOR THE YEARS 1928 and 1929

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DOMINION EXPERIMENTAL STATION, L'ASSOMPTION, P.Q.

REPORT OF THE SUPERINTENDENT, J. E. MONTREUIL, B.A., B.S.A.

THE FARM

The farm, bought in the spring of 1928 for the establishment of the Experimental Station of L'Assomption, has a total area of one hundred and fifty acres. It is well located, being crossed by the Montreal-Quebec provincial highway and having, as its eastern boundary, the main road to Joliette and to the most important tobacco centre of the district north of Montreal.

The physical composition of the soil offers great variations: on the south part, along the river, it is a sandy loam on cold quicksand; then a strip of clay loam about 200 yards wide crosses the whole farm. North of that clay strip, the soil varies from sandy to light sandy loam on cold, light coloured quicksand. That part of the farm, north of the railway and west of the wood lot, is very poor and stony. East of the wood, the top soil is a light sandy loam, dark in colour on a subsoil of gravel and sand, soaked with water the year around. Practically the whole farm needs to be tile drained before it can produce maximum crops, the top soil being kept cold by the wet subsoil.

The whole farm is badly infested with mustard and most of it with quack grass.

All the fences have to be rebuilt and many brushes growing along the fences and ditches had to be cleared. With no exception, all the ditches were in very bad condition, most of them having not been cleaned for the last fifteen years.

The farm buildings, with the exception of the farm house, which can be repaired, could hardly stand up and had to be taken down.

The following plans show how the farm has been divided. South of the railroad a four-year rotation will be followed. A patch of 19·6 acres, not included in the rotation, is kept for experimental work on tobacco. That part of the farm north of the railroad will be used for pasture, oats, and peas.

ACTIVITIES IN 1928

THE SEASON

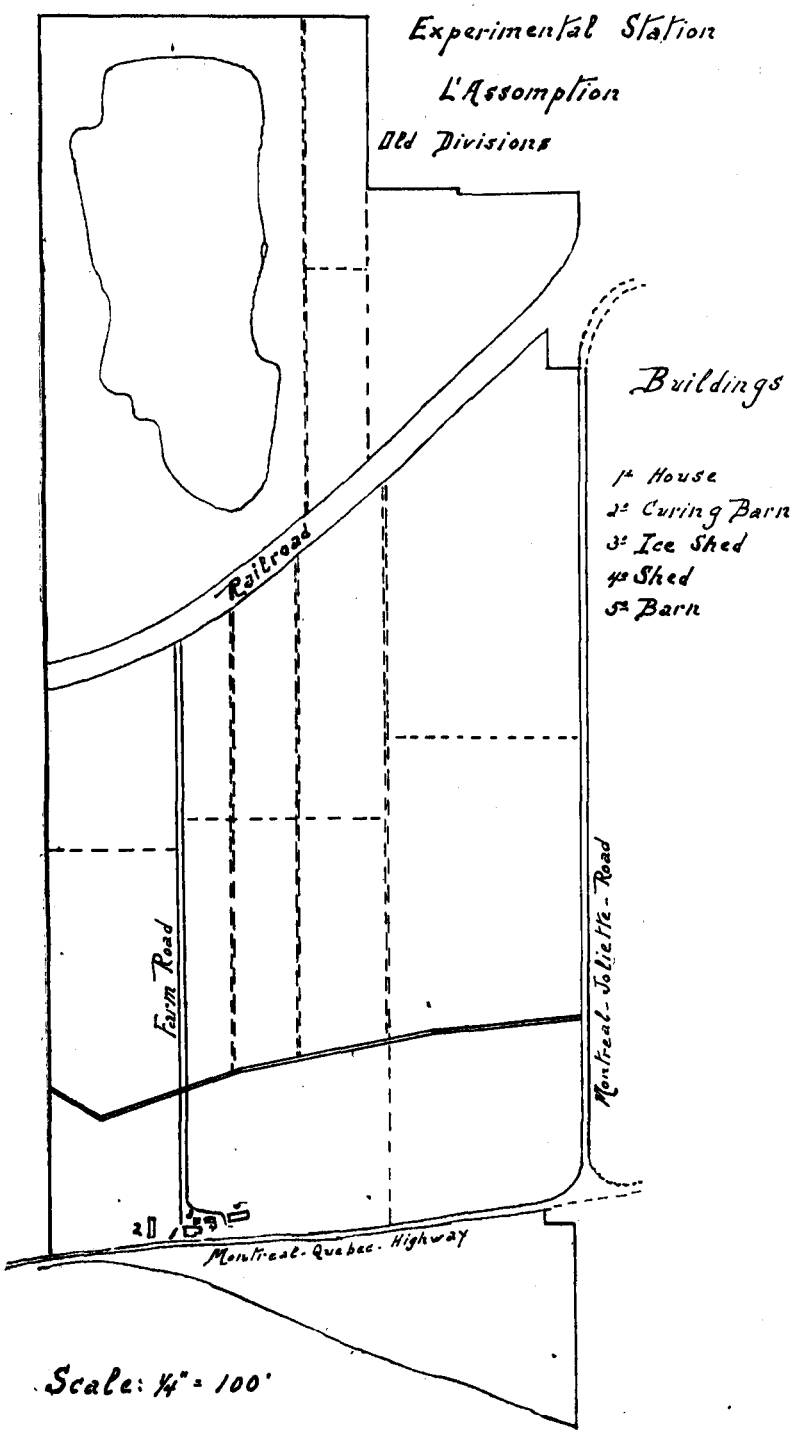
The spring of 1928 was abnormally rainy. After a few days of fine weather, in the beginning of May, when very little work could be done to prepare the soil, it rained almost every day till the end of the month, so that most of the grain crop was sown in June.

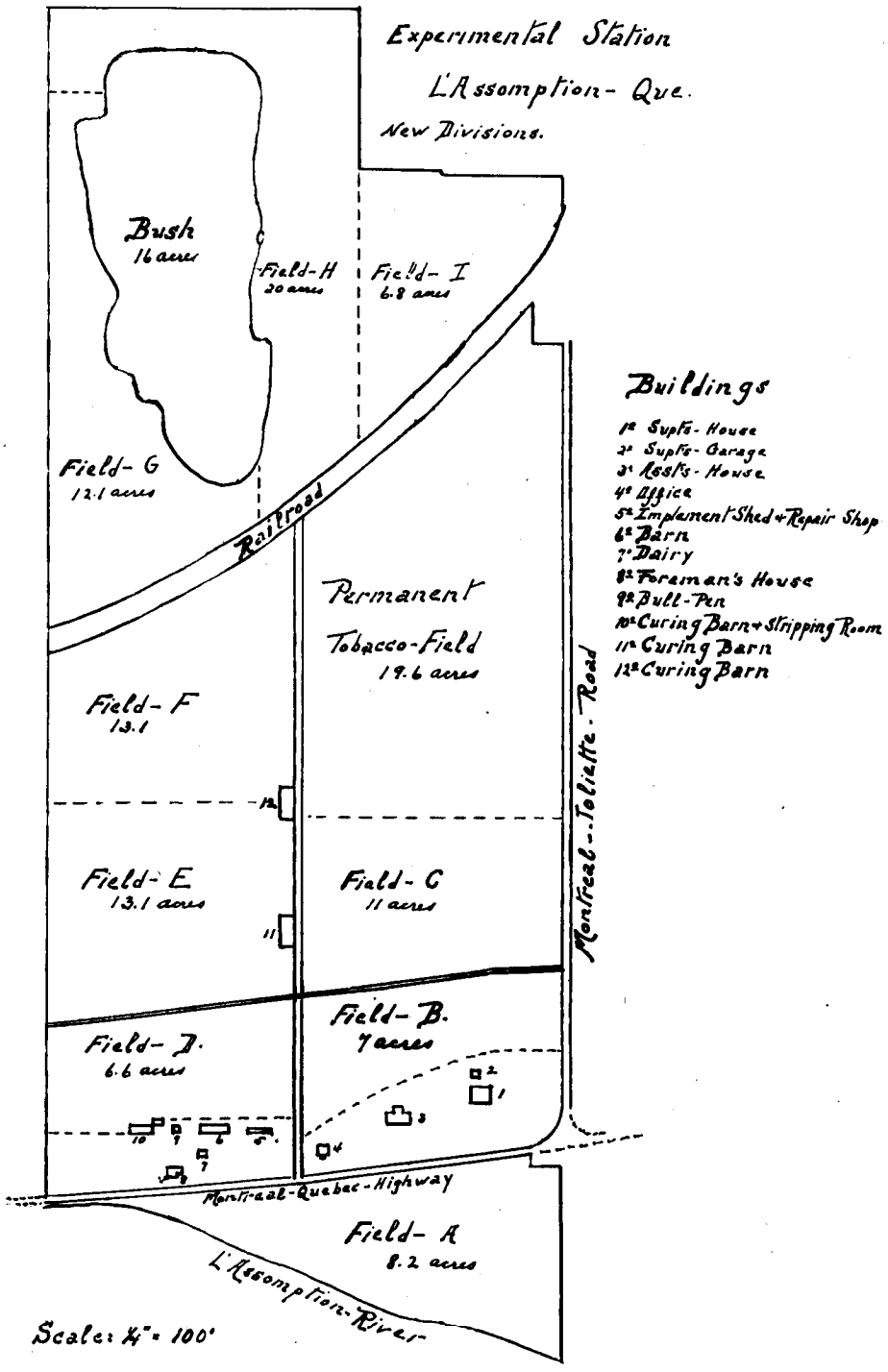
The summer was about normal, however, on account of short but frequent rains in July, hay stored in good condition was scarce.

FARM WORK AND CROPS GROWN

Most of the work on the farm, in 1928, consisted in cleaning ditches, pulling stumps, blasting stones, repairing fences, etc.

A new farm road, well rounded up, was built during the summer. This road runs from the highway to the railroad and divides that part of the farm, south of the railway, in almost two equal parts. It replaces an old lane which was located on one side of the farm.


Experimental Station
L'Assomption
Old Divisions
Buildings
1st House
2e Curing Barn
3e Ice Shed
4e Shed
5e Barn
Railroad
Farm Road
Montreal-Joliette-Road
Montreal-Quebec Highway
Scale: ¼" = 100'


Experimental Station
L'Assomption - Que.
New Divisions.
Bush
16 acres
Field-H
20 acres
Field- I
6.8 acres
Field- G
12.1 acres
Rail Road
Permanent
Tobacco-Field
19.6 acres
Field- F
13.1
Field- E
13.1 acres
Field- C
11 acres
Field- B.
7 acres
Field- D.
6.6 acres
Field- A
8.2 acres
Montreal - Joliette - Road
Montreal - Quebec - Highway
L'Assomption River
Scale: ¼" = 100'
Buildings
1st Supts - House
2nd Supts - Garage
3rd Asst's - House
4th Office
5th Implement Shed + Repair Shop
6th Barn
7th Dairy
8th Foreman's House
9th Bull-Pen
10th Curing Barn + Stripping Room
11th Curing Barn
12th Curing Barn

Over 2,800 feet of old ditches have been cleaned and opened, but a great deal of work still remains to be done in these ditches which will have to be made still deeper, if they are to take the water away from the fields.

The brook which crosses the farm north of the buildings, and which was merely a small ditch which used to overflow on the adjoining fields after every rain, was widened and dug to a depth of from 3 to 5 feet. A lot of work remains to be done on this brook which is not yet deep enough. The dirt excavated has to be taken away and the sides of the ditch to be lowered.

The farm road crosses this brook on a good concrete bridge during the summer.

OATS.—On account of almost daily rain, only 4 acres of oats could be sown about the middle of May, the balance being sown only in June. The oats came up well, but a month later, judging from the appearance of the field, one would have thought that mustard, not oats had been sown. This late sowing on mustard-infested land could result only in a low yield, 31 acres of oats giving an average per acre of only 20 bushels of grain weighing from 30 to 32 pounds per bushel.

CORN.—The corn plantation was divided in two fields: 2 acres in the western part of field A, on very wet soil, where the corn grew yellow and thin, and 6 acres in field B, which was so wet that, in some places, the corn grew only two feet high. The average yield was about 7 tons per acre, with the exception of a small patch of about one acre which yielded about 15 tons per acre.

Unfortunately the silo could not be finished early enough and the corn was damaged by the frost before it could be harvested on September 21.

TOBACCO.—This crop was planted between June 13 and 20, on soil poorly drained and badly infested with black root-rot. Two varieties only were grown: Connecticut Havana No. 38 and Havana 142A 3X. The latter variety, on account of its resistance to Thielavia root-rot, gave a yield of 1,228 pounds per acre while the Connecticut Havana No. 38 gave 800 pounds per acre.

The quality of the tobacco after curing was rather poor; it had been grown on wet soil infested with black root-rot, and it was harvested by inexperienced labour with poor wagons. On account of lack of space in the only curing barn available on the farm, about one-quarter of the tobacco crop was harvested too late and damaged by the frost.

HAY.—Besides about 2 acres of excellent clover, the hay crop was very poor. North of the railroad, out of a field of over 30 acres which had not been ploughed for the last 12 or 15 years, only three loads of very poor hay were harvested.

BUILDINGS

The construction of one cow and horse barn, one implement shed and repair shop, a small dairy, one tobacco curing barn, the farm office and the superintendent's house, represent the greatest part of the work on the Station during 1928.

Without any exception the foundations of all these buildings had to be made either quite high on account of the slope of the ground or quite deep on account of the quicksand subsoil.

IMPLEMENT SHED AND REPAIR SHOP

This is a building 72 feet long by 26 feet wide on good concrete foundations. In one end, a space of 26 feet by 24 feet has been equipped for a repair shop in which most of the blacksmithing and carpenter's repairs or other jobs are made. During the summer, the implement shed was used to store the dry lumber bought for the other buildings.

Implement shed and repair shop.

HORSE AND COW BARN

This is a building 104 feet long by 36 feet wide. It is equipped to house twenty adult cows and seven horses. In the cow barn, there is also one feed room and three large box-stalls for calves and cows that need to be isolated. The horse barn also includes a harness room.

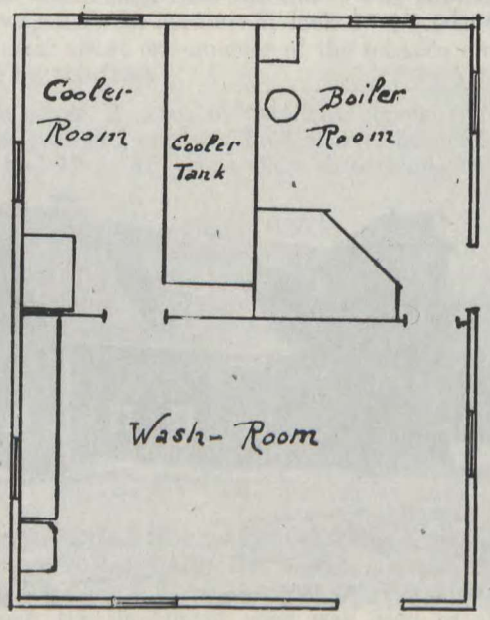
In the hayloft have been built one large bin for oats and a storeroom for the concentrates fed to the cattle. Between the horse and the cow barn, a 14-foot driveway permits the easy handling of the hay and straw.

In the silo built in front of the barn and opening into the feed room, about 100 tons of corn can be stored.

Horse and cow barn.

Dairy

Dairy



Scale: ⅛" = 1'0"

DAIRY

Built 60 feet away from the barn, this building is 21 feet by 23 feet in size. It has been divided in three parts. One is used as washing and work room in which can also be installed a separator. In the other part a one-and-a-half horse-power boiler furnishes the steam necessary for sterilizing the milk cans, pails, etc. In the third one, an electric refrigerator economically replaces a costly ice-house.

TOBACCO CURING BARN

Only one curing barn was built this year. It is 100 feet long, 30 feet wide, and can house 2,860 laths of tobacco spaced 8 inches apart. It is modern in every detail and very handy to work in.

OFFICE BUILDING

The office was also built during the summer. It is a wooden building 26 feet square; it is one story high, but the attic is large enough to make two comfortable rooms or a small laboratory.

SUPERINTENDENT'S HOUSE

This house was built in the fall of 1928 and the following winter, and is a very good brick veneered house.

Both the office building and the superintendent's house have 8 feet deep concrete foundations on 1 by 30-inch footings, made necessary by the quicksand subsoil.

WATER

The only water available on the farm was pumped from the river by an old windmill into a small tank built in the loft of the old hay barn. When this barn was taken down a 900-gallon steel tank was installed in the basement of the office building, and the old windmill was replaced by a small ½-horsepower electric motor. New water pipes now run to all the new buildings. But, as this water is absolutely polluted by the sewage from the town of L'Assomption, another source of water had to be found, and as no good springs could be located in the vicinity, an artesian well seemed to be the only way to get water.

The drilling of this well was started in September. The first 136 feet of drilling was made in blue clay and then through limestone and some igneous formation, very hard to drill. On March 31 the drilling had reached a depth of 890 feet.

THE YEAR 1929

THE SEASON

The spring was about normal, rather cold, but with enough sun in April and May to facilitate the production of tobacco plants. July and August was very dry and ideal for harvesting hay and oats in excellent condition. With no frost in the first fortnight of September, even the late crops of tobacco were harvested before being damaged by the cold weather.

ANIMAL HUSBANDRY

DAIRY CATTLE.—Early in 1929 the foundation of a herd of Holstein Friesian dairy cattle to be kept on this Station was made, consisting of one good bull one and a half year old, two adult cows, one 3-year-old cow, two 2-year-old heifers in milk, two 2-year-old dry heifers, and two calves—one a month old and the other two weeks old. All this stock, although not very uniform in type, possesses good breeding.

When tested for tuberculosis shortly after their arrival the best milking cow, Linda Queen, six years old, reacted and had to be slaughtered, in spite of the fact that she had just come out of an accredited herd. This cow had made three consecutive and official records of 14,966, 15,216, and 14,267 pounds of milk, each time calving inside of a year. Three calves dropped during the year increased the number of cattle to thirteen head.

No experiments have yet been started in connection with dairy husbandry, but all the animals have been tested for tuberculosis and have also undergone the blood test for contagious abortion, passing both of these tests successfully, with the exception of the one case noted above.

HORSES.—Seven work horses are now being kept, but when the farm has been put into better condition it is thought that only five horses will be required to do all the farm work, even with a great increase in the number of trial plots.

For these first two years a great deal of horse labour was required for hauling building material, removing stones and stumps from the fields, and for grading roads and the sides of ditches, etc.

FIELD HUSBANDRY

The work in 1929 consisted only in growing hay, oats and corn for the live stock and a preliminary experiment in eradicating mustard.

OATS.—All the old meadows were seeded down to oats and grass seed, with an application of 320 pounds of fertilizers made up as follows: nitrate of soda 80 pounds, superphosphate 200 pounds, muriate of potash 40 pounds. The yield of the oats ranged all the way from 20 to 45 bushels, according to the fields where grown, the average being 32 bushels per acre. There is no doubt that the fertilizers were very beneficial, for the soil was very poor, and with better drainge conditions the yield would have been much better.

CORN.—Planted on field A, on sandy loam with very wet quicksand subsoil, the corn suffered from an excess of moisture, and this was very noticeable from the yellow appearance of the plants in many parts of the field. No manure was given to this crop, but an application of fertilizers made as follows was applied per acre: nitrate of soda 70 pounds, sulphate of ammonia 60 pounds, superphosphate 300 pounds, and muriate of potash 70 pounds. The yield ranged between 12 and 18 tons per acre.

SPRAYING TO KILL MUSTARD

The whole farm is badly infested with mustard, which was especially bad in a 6·8-acre field seeded to oats. To kill this mustard, it was decided to spray it with solutions of copper sulphate and common salt.

The spraying should have been done when the oats were about 6 to 8 inches tall, or before the mustard had developed any flower stems. Unfortunately, no spraying pump was available before July 4, and the spraying was done on July 5 and 6, when the oats were over 2 feet high and the mustard had flowered.

The copper sulphate was used in solution of 5 per cent and the salt 20 per cent, about 90 gallons of spraying material being used per acre. The spraying was done between 9 a.m. and noon with a small hand pump operating four nozzles.

No damage was done to the stems of the oats, but the two solutions slightly scorched the tip of the oat leaves. No damage was done to the clover. All the mustard reached by the solution was blackened and killed and for two weeks no mustard was visible on that part of the field which had been sprayed, whilst on a strip in the middle of the field where no spraying had been done, the mustard was nearly as thick as the oats were. Later on, some late mustard

plants which probably had not been reached by the spraying solution appeared all over the field, but the oats which had been sprayed appeared clean when compared with those which had not been sprayed.

No difference in efficiency could be made between common salt and copper sulphate.

As the salt solution costs $2.88, the copper sulphate solution $4.05 per acre and the manual and horse labour about 90 cents, the total cost of spraying amounts to about $3.78 per acre for spraying with a 20 per cent salt solution and $4.95 with the 5 per cent copper sulphate solution.

To spray large fields of oats, a good spraying outfit would reduce the cost for labour and would permit a more efficient spraying.

TILE DRAINING

As practically the whole farm needs to be tile drained, it was not practical to do such a work by hand, no expert labour for this kind of work being available in this district. At first we thought to have the work done by contract, but some calculations soon proved that it would have been more costly than to buy a small ditching machine and have the work done by our farm labourers when the crops were removed from the fields. Had the work been done by contract, most of our crops would have been spoiled, the contractor would not have stopped his machine and his crew of men while waiting for the crops to be removed from the fields. The lowest quotation we could secure to have the work done by contract in soil where no stones would interfere with the digging was 70 cents per rod for digging the trenches and laying the tiles, the back filling of the trenches not being done by the contractor.

A total of 38,648 feet of tile were laid at a depth ranging from 2 feet 10 inches to 4 feet 6 inches, the average depth being about 3 feet.

Before we got the ditcher 6,352 feet of tile draining had been made by hand. The total of tile laid this year amounts to 45,000 feet.

Hereafter will be found the number of days the ditcher was used, the cost of the tile and the other items forming the total cost of the draining done with the ditcher.

Number of feet of tile laid	38,648
Number of days the ditcher was used	38 days
Average length of drain dug per day	1,017 feet
Average depth of ditches	3 feet
Number of hours spent to repair the ditcher, sharpen the cutters etc	103 hours

Cost

Depreciation on the ditcher (15 per cent on $2,700)	$	405 00
Interest on ½ cost price of ditcher at 6 per cent		81 00
Repair pieces and spare parts		136 81
Labour for repairing machine, etc		108 84
Labour for hauling and removing stones from the trenches and back filling of trenches		671 08
Horse labour for same		45 20
Gasoline (304 gallons at 24 cents)		72 96
Grease and oil		5 00
Dynamite, fuse detonators		18 50
Total	$	1,544 39
Cost per foot for use of machine, labour, etc	$	0·04
Cost of tile per foot	$	0·0295
Total cost per foot of complete draining	$	0·0395

Although this price seems quite reasonable, the work was made more difficult and more costly by the many stones and the quicksand encountered in digging the trenches. In some places as many as three big loads of stones were removed from 100 feet of trenches. Most of the time, when the digging wheel

was lifted out of the trench to remove some stones, the sides of the ditch caved in and this means each time quite an amount of dirt that had to be shovelled by hand before the machine could be backed up and the digging wheel dropped in place.

DITCHES

Over 6,000 feet of ditches have been cleaned, deepened or opened like new ditches.

The brook which crosses the farm was dug to a depth ranging from 4 to 7 feet deep and the dirt excavated taken away.

FENCING

Three thousand and one hundred feet of new fences have been made and the posts for four thousand more feet of fencing along the farm road are ready for the wiring to be put on.

CARE OF GROUNDS

An area of three acres has been seeded for a lawn.

Along the highway a border has been started with the plantation of some 1,200 plants of Japanese Barberry.

In the fall, 2,800 tulips, 98 plants of peonies, 118 bearded iris, 172 Japanese iris, 176 phlox were planted.

TOBACCO

HOT WATER VERSUS MANURE TO HEAT TOBACCO PLANT BEDS

South of Montreal tobacco plant beds known as semi-hot and built without the use of manure give excellent results and are to be preferred to beds built with manure, but in the counties of L'Assomption and Montcalm, where the spring is somewhat later, it is very doubtful if beds depending only on the sun to heat them, can produce transplantable tobacco plants early enough to be set in the field in the beginning of June, especially if these plant beds are disinfected with formaldehyde.

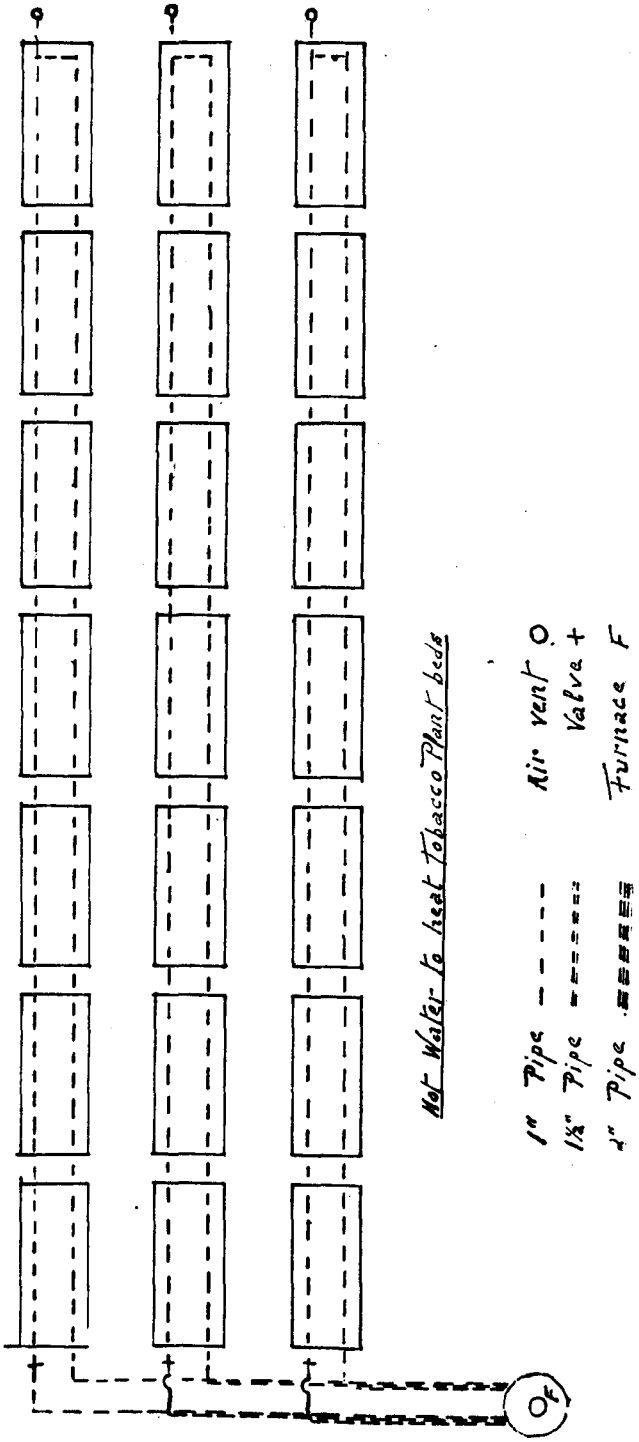
On the other hand, it is quite a problem for most of the growers to have at their disposal, at the right time, enough horse manure for a few hundred square feet of beds. In New Jersey, quite a few market gardeners are now keeping the horse manure available to fertilize their soil and use either a hot-water system or hot air to heat their plant beds early in the spring. It was thought that a similar system could be tried for growing tobacco plants.

Although the initial cost may seem high, a hot-water system for heating plant beds can be built by the labour available on any farm. Such a system will last several years the annual cost will probably be lower than the cost of manipulating the manure.

The amount of fuel consumed by the furnace should not be very great for, on sunny days, one firing at night during cold weather should keep the beds warm enough. On cold cloudy days in April, however, firing during the daytime is very beneficial, but after May 10, one may depend entirely on the sun to heat the beds.

In the spring of 1929 a hot-water system was put up to heat 1,260 square feet of beds. As the time at our disposal was very short, the installation of this water system was put up in quite a crude way, the object being only to get some ideas on the length of pipe and the size of furnace required for the area of beds at our disposal for this experiment.

The pipe line consisted of only two lines of one-inch pipe run one foot inside the frame about 8 inches below the surface of the moulds. A Gurney No. 2 furnace was used.


Hot Water to heat Tobacco Plant beds
1" Pipe
1½" Pipe
2" Pipe
Air vent
Valve
Furnace
F

The cost of the whole system was as follows:—

Furnace, Gurney No. 2	$ 77 00
Pipe (not galvanized)	66 00
Valves, fittings, etc.	13 40
Labour	12 00
Total	$ 168 40

As such an installation would last about twenty years, the annual cost would not be over $8.40. This is less than the cost of hauling and manipulating the manure required to build the hotbeds. On the other hand, the fuel required for the furnace and the time spent firing is more than paid by the value of the manure economized.

In these hot-water heated beds the tobacco seed germinated and the plants started to grow just as fast as in the beds warmed up by the use of manure and much quicker than in the ordinary cold beds. The results of last spring, however, show that probably with three lines of pipe instead of two, the moulds would be warmed up more uniformly. It was also found that such a system of beds should be installed on very well drained soil. Our beds, this year, were located on the slope of a hill and the water seeping from the hillside kept the soil around and under the beds quite cold until the end of May. Under these conditions more heat was necessary to warm up the beds.

TOBACCO PLOTS

We had in tobacco this year a total of 319 plots for experimental work. However, on account of great variation in the drainage conditions of the soil and other disturbing factors, the results in 1929 may better be taken as indications of the soil and drainage variations rather than the specific effects of the treatments applied.

VARIETY-TEST

Cigar Binders Varieties.—Ten cigar binder varieties of tobacco were grown. The test was made in quadruplicate in one-fortieth acre plots with only one exception, 142C 3X Farnham 1924, of which we had just enough plants for three plots.

All the plots received the same cultural treatment and the same amount of the following mixture of fertilizer, applied at the rate of 2,900 pounds per acre:—

Nitrate of soda	210 pounds	
Ammonium sulphate	160 pounds	
Cotton seed meal	1,420 pounds	Formula
Superphosphate	750 pounds	5-5—5-5—7
Sulphate of potash	360 pounds	
Total	2,900 pounds	

The plants were set in the field on June 17 and 18; topped on August 14; and harvested from September 4 to 6. Two suckerings were made, the first one ten days after topping and the other at harvest.

Table 1 gives the yield per acre for each plot and the average yield for each variety.

TABLE 1—YIELDS OF CIGAR BINDER TOBACCOS

Varieties	Yields per acre					Rank according to yield
	Plot 1	Plot 2	Plot 3	Plot 4	Average	
	lb.	lb.	lb.	lb.	lb.	
142C 3 X F. 24	2,160	1,720	2,000	3 series only	1,960	1
142A 3 X W	1,600	1,800	1,800	1,180	1,595	5
142A 3 X F. 27	1,640	1,940	2,080	1,800	1,865	2
142C 3 X W	2,120	1,340	1,400	1,220	1,520	8
142A 3 X J	1,840	1,280	1,590	1,640	1,587·5	6
Comstock Spanish	1,640	2,060	1,520	1,700	1,730	3
C. B. Hockanum	1,540	1,560	1,260	1,280	1,410	9
C. B. Williams	680	1,800	1,160	1,620	1,315	10
C. H. Stanton F. B	1,680	1,600	1,750	1,080	1,527·5	7
C. H. 38	1,380	1,840	1,680	1,500	1,600	4

The wide variation in the yields of the same variety undoubtedly indicates the extent of soil variability on the different plots.

These tobaccos have not yet been examined for quality after curing. At harvest time, on the basis of type and appearance, the Connecticut Havana No. 38 was inferior to none of the others. The Comstock Spanish had rather too narrow leaves. No great difference could be seen between the strains resistant to Thielavia basicola, with the exception that the 142C 3XF and 142C 3XW have wider leaves, and that 142A 3XW and 142A 3XF have more leaves on a shorter stem than all the other varieties grown. There was not much difference between the C. H. Stanton F. Brown and the Comstock Spanish. The two Connecticut Broadleaf varieties, Williams and Hockanum, were more damaged by the wind than any of the other varieties. But, here, it must be mentioned that the Hockanum did not appear true to type.

PIPE TOBACCO VARIETIES

Nine varieties of pipe tobacco were grown, also on quadruplicated plots of one-fortieth acre. The fertilizer mixture was the same as given to the cigar binder varieties. Here again, the results show that there were great variations in the soil drainage, for the texture of the soil itself and its fertility seem to be fairly even.

These tobaccos have not yet been tested from the standpoint of quality. The three strains called Grand Rouge were grown from seed secured for us from farmers of the district by Mr. R. Cartier, Tobacco Specialist of the Quebec Department of Agriculture. There is a limited market for this type of tobacco, but the three strains we have grown this year will require a great deal of selection before they can be recommended. On each plot of these tobaccos many different types of plants could be found. This could be expected when one knows how the tobacco seed is grown in this district; no bagging of the seed plants is done and frequently there are two or more varieties or types grown in the same field where the seed plants are grown.

Table 2 gives the yields of each plot and the average yields per acre.

TABLE 2—YIELDS OF PIPE TOBACCO

Varieties	Yield per acre					Rank according to yield
	Plot 1	Plot 2	Plot 3	Plot 4	Average	
	lb.	lb.	lb.	lb.	lb.	
Little Dutch Shoestring	840	1,780	2,040	1,200	1,465	2
Little Dutch Ragondorf	300	1,740	2,0.0	1,280	1,335	4
Belge 3007	800	1,400	1,720	800	1,180	6
Grand Rouge 2	1,300	1,560	1,600	1,000	1,365	3
Grand Rouge 3	1,660	1,620	1,320	1,480	1,520	1
Grand Rouge 4	720	1,240	1,560	1,220	1,185	5
Parfum d'Italie	820	1,280	1,060	1,240	1,100	7
Petit Havane	460	660	600	700	605	9
Canelle	500	840	520	680	635	8

PAPER MULCH

The objects of this experiment were:—

(*a*) To find out the effect of a paper mulch on the growth and quality of tobacco;

(*b*) To determine if a paper mulch could be used economically in tobacco culture.

The test was made on five plots of one-fortieth acre each, two check plots and three plots covered with paper mulch.

Paper used: Gator, Grade A, costing $8.80 per roll of 300 yards, 36 inches wide, f.o.b. Montreal. (Beveridge Supply Co.)

The paper was spread between the rows of tobacco, close to the plants, immediately after the plants were set in the ground by machine. Some dirt thrown on the margin of the paper was intended to keep it in place, but when so covered with dirt, the paper decayed very quickly and the wind tore it away. So in many places, the paper had to be replaced.

No machine being available for this kind of work, the paper had to be laid by hand, 110 hours of labour being required per acre.

On account of variations in the physical condition of the soil on the different plots, no definite conclusions can be drawn.

The use of paper eliminates the necessity of hoeing and cultivating, which cultural operations cost about the same as laying the paper.

At the present prices the paper would cost $141.97 per acre. This means that it would take an increase of 709 pounds of tobacco at 20 cents per pound to pay for the paper only.

Against all expectations, the temperature 1½ inches deep in the soil was practically the same under the paper and in the bare soil.

Average Temperature

——	7 A.M.	Noon	5.30 P.M.
	°F.	°F.	°F.
Paper mulch plots—			77
July	65	75	69
August	60	70	73
Mean	62	73	
Check plots—			77
July	66	76	69
August	61	70	73
Mean	63	73	

Average height of ten plants

August 3—
Paper mulch plots ..... 8·45 inches
Check plots ..... 7·45 "
August 10—
Paper mulch plots ..... 12 inches
Check plots ..... 10·20 "

Table 3 gives the yield of each plot.

TABLE 3—EXPERIMENTS WITH MULCH PAPER

Mulch plots		Check plots	
Plot No.	Yields	Plot No.	Yields
	lb.		lb.
G-1	1,800	G-2	1,680
G-3	1,350	G-4	1,520
G-5	1,380		
Average yield	1,510	Average yield	1,600

TOPPING TOBACCO

The purpose of this experiment was to determine the influence of topping, made at different stages of growth and heights, on the quality and yield of cigar binder tobacco. All treatments were in quadruplicate.

Always on account of lack of uniformity in the soil of the different plots, the results of this year are not very reliable; however, they seem to indicate:—

1. That high and early topping (bud stage) gives heavier yields than late topping or topping made at early bloom stage.

2. That high and early topping also gives better yields than low and early topping.

3. That there is not much difference in yield between high and low topping when topping is done at early bloom stage.

4. That high topping gives higher yields than low topping when topping is done late (full bloom) probably because, in this case, the top leaves on low topped plants have not enough time to take their full size.

Tobacco topped high at full bloom, also produces top leaves noticeably narrower than tobacco topped low or early.

5. Tobacco topped at harvest gives unmatured tobacco which cures very late with a high percentage of fat stems.

The tobacco grown on these plots have not yet been examined for quality.

Table 4 gives the yield of each plot per acre and the average yield for each stage and height of topping.

TABLE 4—TOPPING AND SUCKERING EXPERIMENTS

Topping stages	Height of topping	Suckering	Yields per acre				
			1	2	3	4	Average
			lb.	lb.	lb.	lb.	lb.
Bud stage	High	A	2,000	2,020	1,820	1,840	1,920
		B	1,900	2,020	1,600	1,680	1,800
		C	1,880	1,520	1,840	1,760	1,750
	Low	A	2,040	1,800	1,920	1,680	1,860
		B	1,730	1,650	1,580	1,800	1,690
		C	1,780	2,100	1,690	1,780	1,838
Early bloom	High	A	1,580	1,920	1,530	1,680	1,678
		B	1,350	1,680	1,980	1,840	1,712
		C	1,640	1,840	1,580	1,700	1,690
	Low	A	1,600	1,620	1,640	1,780	1,660
		B	1,680	2,000	1,620	1,560	1,715
		C	1,560	1,740	1,780	1,600	1,670
Full bloom	High	A	1,620	1,760	1,800	1,840	1,755
		B	1,730	1,760	1,760	1,880	1,782
		C	1,680	1,980	1,600	1,620	1,720
	Low	A	1,720	1,510	1,600	1,740	1,642
		B	1,700	1,680	1,120	1,460	1,490
		C	1,640	1,580	1,060	1,420	1,425
Seed pods	Topped and suckered at harvest		1,940	1,980	2,040	1,680	1,910

A = Suckered once at harvest.
B. & C. = Suckered twice, one week after topping and at harvest.

SUCKERING TOBACCO

The seventy-six plots used for an experiment on topping were also used to determine the influence of suckering on the quality and yield of cigar binder tobacco.

Plans had been made to do the suckering as follows:—

(*a*) Once at harvest.

(*b*) Twice: one week after topping and at harvest.

(*c*) Several times: at topping and every week till harvest.

Unfortunately only the two first methods of suckering could be followed.

The tobacco grown on these plots has not yet been examined for quality. From the standpoint of yield, the suckering had apparently no influence, but it must be remembered that, on account of lack of uniformity in the soil, the results of this year are not a true indication of the effects of suckering. A study of table 4 clearly shows that the two different methods of suckering were not the only factor that influenced the yield.

HOPS AND YEAST AND TOBACCO STEMS USED AS FERTILIZERS IN GROWING TOBACCO

A study of table 5 easily shows that no reliable deductions can be drawn out of this year's results. Yield variations on similar plots are so wide that it is clear the materials applied as fertilizers were not the only factor to influence them. That hops and yeast can be used in growing tobacco is shown by treatment No. 8.

On the other hand if treatment No. 6 means something, a heavy application of hops and yeast is harmful. None of the plots which had received an application of 11,000 pounds of hops and yeast per acre gave as high a yield as the lowest one given by the plots which had an application of only 6,600 pounds of the same fertilizing material.

That tobacco stems are efficient in growing good yields of tobacco is shown by treatment No. 7. Here again it is evident that the tobacco stems were not the only factor to influence the yield.

On 4 plots, M-7, M-7-1, M-7-2, M-7-3, 3,000 pounds of tobacco stems were used to replace 920 pounds of cotton seed meal used on plots M-1-4, M-1-5, M-1-6, M-1-7 as a source of organic nitrogen and potash. If we compare the yields of these two sets of plots, we find that the tobacco stems used as fertilizers for tobacco have a value of about $17.17 when the price of cotton seed meal is $56 per ton. In fact, the value of tobacco stems is probably much higher than $17.17, for, as a glance at table 5 will show, on plot M-1-7 the yield is abnormally small, indicating that some unknown factor (probably an excess of moisture) has lowered the yield.

TABLE 5.—HOPS AND YEAST AND BASAL FORMULA

Treatment No.	Fertilizers applied per acre		Plot No.	Yield per acre
		lb.		lb.
No. 6—Hops and yeast, 11,000 pounds per acre as source of organic nitrogen.	Superphosphate	470	M-6	1,430
	Sulphate of potash	300	M-6-1	1,300
			M-6-2	1,520
			M-6-3	1,640
	Total	770		
	Average yield			1,472.5
No. 7—Tobacco stems, 3,000 pounds per acre as source of organic nitrogen and organic potash.	Nitrate of soda	210	M-7	1,500
	Ammonium sulphate	160	M-7-1	1,330
	Cottonseed meal	500	M-7-2	1,720
	Superphosphate	790	M-7-3	1,960
	Total	1,660		
	Average yield			1,627.5

TABLE 8.—HOP AND YEAST AND BASAL FORMULA—*Concluded*

Treatment No.	Fertilizers applied per acre		Plot No.	Yield per acre
No. 8—Hops and yeast, 6,600 pounds per acre as source of organic nitrogen.	Nitrate of soda	210	M-8	1,730
	Ammonium sulphate	160	M-8-1	1,700
	Superphosphate	688	M 8-2	1,640
	Sulphate of potash	348	M-8-3	2,140
	Total	1,406		
	Average yield			1,802
No. 9—Basal formula, checks	Nitrate of soda	210	M-1-4	1,540
	Ammonium sulphate	160	M-1-5	1,680
	Cottonseed meal	1,420	M-1-6	1,660
	Superphosphate	750	M-1-7	1,740
	Sulphate of potash	360		
	Total	2,900		
	Average yield			1,655

BROADCASTING VERSUS DRILLING FERTILIZERS

This experiment was also made in quadruplicate on one-fortieth-acre plots, and two different rates of application were tried.

On all the plots, the fertilizers were spread by hand as evenly as possible. Where drilled, the fertilizers were not applied in a single row, but in two small rows 2 to 3 inches deep and 8 inches apart, the tobacco plants being set between these two rows.

The results of this year do not agree with those obtained in many other places but the great variations in the yields of the plots which received the same treatment, clearly show that the method of application of fertilizers was not the only factor to influence the yield. During the summer it was also very noticeable that almost all the plots where the fertilizers were drilled suffered much more from an excess of moisture than the others. For this reason these results can only be considered as indications of the soil conditions, but have no value for the determination of the best method of applying fertilizers to the tobacco crops.

Table 6 gives the yields of each plot and the average yields.

TABLE 6.—BROADCASTING VERSUS DRILLING FERTILIZERS

Fertilizers broadcasted			Fertilizers drilled		
Plot No.	Yields per acre	Rate of application	Plot No.	Yields per acre	Rate of application
	lb.	lb.		lb.	lb.
H-1	1,940	1,500	H-2	1,700	1,500
H-3	1,860	1,500	H-4	1,860	1,500
H-5	1,940	1,500	H-6	1,660	1,500
H-7	1,600	1,500	H-8	1,720	1,500
Total	7,340		Total	6,940	
Average	1,835		Average	1,735	
H-9	1,700	2,000	H-10	1,520	2,000
H-11	1,720	2,000	H-12	1,700	2,000
H-13	1,720	2,000	H-14	1,650	2,000
H-15	1,720	2,000	H-16	2,120	2,000
Total	6,860		Total	6,990	
Average	1,715		Average	1,748	

Comparison of Home Made Mixture With Ready Mixed Fertilizers

As we had available, some ready mixed fertilizer for which big claims were made, it was thought interesting to compare it with the home made mixture of fertilizers used as a standard or base formula in our other experiments.

This home made mixture which costs $48.75 per ton is made of:

	Lbs.	
Nitrate of soda	210	Formula 5.5–5.5–7
Sulphate of ammonia	160	
Cottonseed meal	1,420	
Superphosphate	750	
Sulphate of potash	360	

The ready mixed fertilizer used, sold last year at $100.00 per ton and its formula was supposed to be 10-14-10. If this formula were true, an application of this fertilizer at the rate of 2,900 pounds per acre furnished:—

290 pounds of nitrogen,
406 pounds of phosphoric acid,
290 pounds of potash.

Whilst an application at the same rate of the home made mixture gave only:—

160 pounds of nitrogen,
160 pounds of phosphoric acid,
200 pounds of potash.

Although the homemade mixture costs $70.06 an acre, it gave 1,700 pounds of tobacco per acre, while the ready mixed fertilizer costing $145 per acre produced 1,790 pounds. But this light increase of 90 pounds per acre costs $74.94 or 83 cents per pound.

The small amount of ready mixed fertilizer available did not permit to make this test in duplicate. Table 7 gives the results and the fertilizers applied.

Table 7.—Comparison of Home Made Mixture with Ready Mixed Fertilizers

Treatment No.	Fertilizers applied per acre	lb.	Plot No.	Yield per acre lb.
No. 1—Basal formula	Nitrate of soda	210	L-24	1,700
	Ammonium sulphate	160		
	Cottonseed meal	1,420		
	Superphosphate	750		
	Sulphate of potash	360		
	Total	2,900		
	Average yield			1,700
No. 2—Ready mixture 10-14-10	Ready mixture 10-14-10	2,900	L-25	1,790
	Total	2,900		
	Average yield			1,790

FERTILIZER FORMULAE AND MORE EFFICIENT SOURCES OF NITROGEN, PHOSPHORIC ACID AND POTASH

To find out the best formula, the more efficient sources of nitrogen, phosphoric acid and potash, a total of 132 plots of one-fortieth acre were required to make the test in quadruplicate.

In order that the yield of one plot may not be influenced by the fertilizers used on the next plot, between each two adjacent plots there was a guard row. This border row was not included with the plots.

The lack of uniformity of the soil also applies to the plots used for these experiments with fertilizers.

MANURE AND FERTILIZERS.—Relative merit of barnyard manure (mixed horse and cow) supplemented with commercial fertilizers and manure alone, in comparison with complete fertilizers mixture in the production of binder tobacco.

The fertilizers were applied by hand, broadcasted and then harrowed in.

Date of ploughing, October, 1928. Ploughing in the spring would have been beneficial but it was impossible to do it.

Application of fertilizers: June 12.

Transplanting: June 13.

Cultivation: First time, five days after transplanting.

Hoeing: every ten or twelve days.

Topping: August 14 and 15.

Suckering: Eight days after topping and at harvest.

Harvest: September 3.

Number of plants per plot: 286.

Table 8 gives the yield of each plot and the average yields for each set of four plots having received the same fertilizers, also the amount of fertilizers applied on each plot. The amount of fertilizers and manure was so calculated that each plot received the same amount of nitrogen, phosphoric acid and potash.

TABLE 8.—MANURE AND FERTILIZERS—MANURE ALONE AND FERTILIZERS ALONE

Treatment No.	Fertilizers applied per acre		Plot No.	Yield per acre
		lb.		lb.
No. 1—Basal formula, no manure, checks..	Nitrate of soda	210	M-1	1,520
	Ammonium sulphate	160	M-1-1	1,640
	Cottonseed meal	1,420		
	Superphosphate	750	M-1-2	1,780
	Sulphate of potash	360		
	Total	2,900	M-1-3	1,880
	Average yield			1,705
No. 2—½ basal formula, 10 tons manure....	Nitrate of soda	210	M-2	1,730
	Ammonium sulphate	160	M-2-1	1,410
	Cottonseed meal	240		
	Superphosphate	580	M-2-2	1,720
	Sulphate of potash	200	M-2-3	1,860
	Total	1,390		
	Average yield			1,680
No. 3—¼ basal formula (all mineral nitrogen, 15 tons manure.	Nitrate of soda	128	M-3	1,470
	Ammonium sulphate	100	M-3-1	1,270
	Superphosphate	375	M-3-2	1,240
	Sulphate of potash	105	M-3-3	1,520
	Total	708		
	Average yield			1,375
No. 4—20 tons manure	No commercial fertilizers		M-4	1,390
			M-4-1	1,180
			M-4-2	1,360
			M-4-3	1,600
	Average yield			1,382·5
No. 5—20 tons manure	Superphosphate	250	M-5	1,260
	To balance phosphoric acid in basal formula.		M-5-1	1,160
			M-5-2	1,440
			M-5-3	1,660
	Total	250		
	Average yield			1,380

A study of the above table 8 again clearly shows that the commercial fertilizers and the manure were not the only factors to influence the yield. However, it seems that the commercial fertilizers were as efficient and as economical as manure.

A comparison of treatments No. 1 and No. 4 shows that 2,900 pounds of a mixture of commercial fertilizers costing $70.06 gave an average yield of 1,705 pounds of tobacco per acre, while 20 tons of manure costing $60 gave only 1,382.5 pounds. If we value the tobacco at 20 cents only per pound, this gives an amount of $64.50 in favour of the commercial fertilizers, without taking into consideration the fact that the application of the commercial fertilizers does not cost half what it costs to spread the manure. When the commercial fertilizers only are used, the amount of weeds is also much reduced.

A comparison of treatments No. 1 and No. 3 also shows that when the amount of fertilizers is lowered, the yield also goes down; if only 708 pounds

of commercial fertilizers are used with 15 tons of manure, the yield is practically the same as when manure alone is used.

On the other hand (treatment No. 2) an application of 1,390 pounds of fertilizers with only 10 tons of manure brings the yield to 1,680 pounds per acre.

Treatment No. 5 seems to show that the addition of 250 pounds of superphosphate (48 pounds of P^2O^5) to twenty tons of manure does not increase the yield.

Efficiency of Different Sources of Phosphoric Acid in Growing Cigar Tobacco

The efficiency of superphosphate (16 per cent), of treble superphosphate (48 per cent), and of Diammonphos, a new synthetic fertilizer containing 21 per cent of nitrogen and 53.4 per cent of P^2O^5, has been tested in quadruplicate one-fortieth-acre plots.

Table 9 gives the amount of each fertilizer applied and the yield per plot.

On the standpoint of yields, Diammonphos seems to have been a little more efficient, while superphosphate (16 per cent) and treble-superphoshate (48 per cent) gave about the same yields. It must be noted, however, that there were great variations between the yields of similar plots.

Table 9.—Sources of Phosphoric Acid

Treatment No.	Fertilizers applied per acre	lb.	Plot No.	Yield per acre lb.
No. 1—Basal formula	Nitrate of soda	210	P-1	1,640
	Ammonium sulphate	160	P-1-1	1,600
	Cottonseed meal	1,420	P-1-2	1,680
	Superphosphate	750	P-1-3	1,760
	Sulphate of potash	360		
	Total	2,900		
	Average yield			1,670
No. 2—Treble superphosphate	Nitrate of soda	210	P-5	1,640
	Ammonium sulphate	160	P-5-1	1,350
	Cottonseed meal	1,420	P-5-2	1,740
	Treble superphosphate	250	P-5-3	1,810
	Sulphate of potash	360		
	Total	2,400		
	Average yield			1,635
No. 3—Diammonphos	Nitrate of soda	210	P-6	1,730
	Superphosphate	250	P-6-1	1,590
	Diammonphos	152	P-6-2	1,880
	Cottonseed meal	1,420	P-6-3	1,920
	Sulphate of potash	360		
	Total	2,392		
	Average yield			1,780

Different Rates of Application of Phosphoric Acid in Growing Tobacco

Although not very reliable on account of variations in the soil, the results of this year seem to indicate:—

1. That either mineral phosphoric acid or more than 40 pounds of P_2O_5 from organic sources are necessary to produce a good yield of cigar binder tobacco.

2. That a total of 80 pounds of phosphoric acid per acre or 40 pounds of mineral phosphoric acid is not sufficient to produce maximum yields of tobacco.

3. That increasing the phosphoric acid to 360 pounds per acre does not give higher yields than an application of 160 pounds.

Table 10 gives the yields and the amount of fertilizers applied on each plot.

TABLE 10.—DIFFERENT QUANTITIES OF PHOSPHORIC ACID

Treatment No.	Fertilizers applied per acre		Plot No.	Yield per acre
		lb.		lb.
No. 1—Basal formula, 160 pounds phosphoric acid.	Nitrate of soda	210	P–1–4	1,640
	Ammonium sulphate	160	P–1–5	1,680
	Cottonseed meal	1,420	P–1–6	1,800
	Superphosphate	750	P–1–7	1,790
	Sulphate of potash	360		
	Total	2,900		
	Average yield			1,727·5
No. 2—½ basal formula, 80 pounds phosphoric acid.	Nitrate of soda	210	P–2	1,630
	Ammonium sulphate	160	P–2–1	1,320
	Cottonseed meal	1,420	P–2–2	1,660
	Superphosphate	250	P–2–3	1,670
	Sulphate of potash	360		
	Total	2,400		
	Average yield			1,570
No. 3—No mineral phosphoric acid	Nitrate of soda	210	P–3	1,260
	Ammonium sulphate	160	P–3–1	1,280
	Cottonseed meal	1,420	P–3–2	1,500
	Sulphate of potash	360	P–3–3	1,450
	Total	2,150		
	Average yield			1,372·5
No. 4—Double basal formula, 320 pounds phosphoric acid.	Nitrate of soda	210	P–4	1,850
	Ammonium sulphate	160	P–4–1	1,650
	Cottonseed meal	1,420	P–4–2	1,760
	Superphosphate	1,750	P–4–3	1,900
	Sulphate of potash	360		
	Total	3,900		
	Average yield			1,790

SOURCES OF POTASH

In a comparison made in quadruplicate on 1/40-acre plots, the following materials were used as a source of potash for growing tobacco:—

Sulphate of potash	48	per cent	K_2O
Nitrate of potash	44	"	K_2O
Muriate of potash	48	"	K_2O
Carbonate of potash	63	"	K_2O

A study of table 11 shows that no deductions can be drawn from this year's results; on account of unevenness of the soil, variations of yields are larger between the plots which received the same fertilizers than between the different lots of plots which have received potash from different sources.

TABLE 11—SOURCES OF POTASH

Treatment No.	Fertilizers applied per acre	lb.	Plot No.	Yield per acre lb.
No. 1—Basal formula	Nitrate of soda	210	K-1-4	1,910
	Ammonium sulphate	160	K-1-5	1,400
	Cottonseed meal	1,420	K-1-6	1,780
	Superphosphate	750	K-1-7	1,720
	Sulphate of potash	360		
	Total	2,900		
	Average yield			1,702·5
No. 2—Carbonate of potash	Nitrate of soda	210	K-5	1,820
	Ammonium sulphate	160	K-5-1	1,720
	Cottonseed meal	1,420	K-5-2	1,620
	Superphosphate	730	K-5-3	1,950
	Carbonate of potash	275		
	Total	2,795		
	Average yield			1,777·5
No. 3—Nitrate of potash	Nitrate of potash	246	K-6	1,760
	Ammonium sulphate	160	K-6-1	1,700
	Cottonseed meal	1,420	K-6-2	1,800
	Superphosphate	750	K-6-3	1,700
	Sulphate of potash	135		
	Total	2,711		
	Average yield			1,740
No. 4—1/10 muriate of potash	Nitrate of soda	210	K-7	1,790
	Ammonium sulphate	160	K-7-1	1,830
	Cottonseed meal	1,420	K-7-2	1,920
	Superphosphate	750	K-7-3	1,900
	Sulphate of potash	319		
	Muriate of potash	40		
	Total	2,899		
	Average yield			1,860

DIFFERENT QUANTITIES OF POTASH

Sixteen plots of 1/40 acre were used to find out the influence of different amounts of potash on the yield and quality of cigar binder tobacco. The experiment was made in quadruplicate; the source of potash was sulphate of

potash used at three different rates, 360 pounds, 152 pounds, and 777 pounds per acre, giving with the 27 pounds of potash furnished by the cottonseed meal 200 pounds, 100 pounds, and 400 pounds of potash (K_2O) per acre. On four plots, the only potash applied was the 27 pounds furnished by the cottonseed meal. The amounts of nitrogen and phosphoric acid were the same on all the plots.

The results of this year seem to indicate that the amount of potash in the fertilizer mixture had no influence on the yield of tobacco. But a study of table 12 shows that the amount of potash given to each plot was not the only factor to influence the yield; for instance, on the four plots which received 200 pounds of potash (360 pounds of sulphate of potash) the yields ranged from 1,360 pounds to 1,740 pounds per acre; on the four plots which received 100 pounds of potash (152 pounds of sulphate of potash) the yield ranged from 1,480 pounds to 1,930 pounds per acre. Under these conditions no deduction can be drawn on the influence of different amounts of potash on the yield of tobacco. The tobacco grown on these plots has not yet been examined for quality.

TABLE 12—DIFFERENT QUANTITIES OF POTASH

Treatment No.	Fertilizers applied per acre		Plot No.	Yield per acre
		lb.		lb.
No. 1—Basal formula	Nitrate of soda	210	K-1	1,620
	Ammonium sulphate	160	K-1-1	1,680
	Cottonseed meal	1,420	K-1-2	1,360
	Superphosphate	750	K-1-3	1,740
	Sulphate of potash	360		
	Total	2,900		
	Average per acre			1,600
No. 2—100 pounds of potash	Nitrate of soda	210	K-2	1,900
	Ammonium sulphate	160	K-2-1	1,480
	Cottonseed meal	1,420	K-2-2	1,930
	Superphosphate	750	K-2-3	1,640
	Sulphate of potash	152		
	Total	2,692		
	Average per acre			1,737.5
No. 3—No mineral potash	Nitrate of soda	210	K-3	1,740
	Ammonium sulphate	160	K-3-1	1,720
	Cottonseed meal	1,420	K-3-2	1,520
	Superphosphate	750	K-3-3	1,800
	Total	2,540		
	Average per acre			1,695
No. 4—400 pounds of potash	Nitrate of soda	210	K-4	1,620
	Ammonium sulphate	160	K-4-1	1,510
	Cottonseed meal	1,420	K-4-2	1,540
	Superphosphate	750	K-4-3	1,670
	Sulphate of potash	777		
	Total	3,317		
	Average per acre			1,585

COMPARISON OF DIFFERENT WATER SOLUBLE NITROGEN FERTILIZERS ON THE QUALITY AND YIELD OF CIGAR BINDER TOBACCO

This test also was made in quadruplicate on 32 plots of one-fortieth acre. The sources and amount of potash and phosphoric acid given to each plot were the same. The total amount of nitrogen given was also kept constant for each plot. The sources of nitrogen tried were urea, ammonium sulphate, nitrate of potash, calcium nitrate, nitrophoska No. 3, calurea and diammonphos.

No deduction can be drawn out of this year's experiments, the differences in yield being larger between different plots having received the same mixture of fertilizers than between plots on which different fertilizers had been applied.

Table 13 gives the fertilizers applied on each plot and the yields.

TABLE 13—COMPARISON OF DIFFERENT WATER SOLUBLE NITROGEN FERTILIZERS

Treatment No.	Fertilizers applied per acre		Plot No.	Yield per acre
		lb.		lb.
No. 1—Basal formula	Nitrate of soda	210	N-1	1,620
	Ammonium sulphate	160	N-1-1	1,580
	Cottonseed meal	1,420	N-1-2	1,620
	Superphosphate	750	N-1-3	1,460
	Sulphate of potash	360		
	Total	2,900		
	Average per acre			1,570
No. 2—Urea	Urea	139	N-2	1,420
	Cottonseed meal	1,420	N-2-1	1,640
	Superphosphate	750	N-2-2	1,600
	Sulphate of potash	360	N-2-3	1,630
	Total	2,669		
	Average per acre			1,572·5
No. 3—Ammonium sulphate	Ammonium sulphate	312	N-3	1,670
	Cottonseed meal	1,420	N-3-1	1,260
	Superphosphate	750	N-3-2	1,730
	Sulphate of potash	360	N-3-3	1,690
	Total	2,842		
	Average per acre			1,587·5
No. 4—Nitrate of potash	Nitrate of potash	393	N-4	1,840
	Ammonium sulphate	63	N-4-1	1,370
	Cottonseed meal	1,420	N-4-2	1,840
	Superphosphate	750	N-4-3	1,620
	Total	2,626		
	Average per acre			1,667·5
No. 5—Nitrate of calcium	Nitrate of lime	427	N-5	1,850
	Cottonseed meal	1,420	N-5-1	1,660
	Superphosphate	750	N-5-2	1,720
	Sulphate of potash	360	N-5-3	1,600
	Total	2,957		
	Average per acre			1,707·5

TABLE 13—COMPARISON OF DIFFERENT WATER SOLUBLE NITROGEN FERTILIZERS—*Concluded*

Treatment No.	Fertilizers applied per acre		Plot No.	Yield per acre
		lb.		lb.
No. 6—Nitrophoska No. 3	Nitrophoska No. 3	413	N-6	1,890
	Cottonseed meal	1,420	N-6-1	1,760
	Superphosphate	350	N-6-2	1,840
	Sulphate of potash	198	N-6-3	1,480
	Total	2,381		
	Average per acre			1,742·5
No. 7—Calurea	Calurea	188	N-7	1,740
	Cottonseed meal	1,420	N-7-1	1,820
	Superphosphate	750	N-7-2	1,680
	Sulphate of potash	360	N-7-3	1,700
	Total	2,718		
	Average per acre			1,735
No. 8—Diammonphos	Diammonphos	225	N-8	1,640
	Ammonium sulphate	160	N-8-1	1,560
	Cottonseed meal	1,420	N-8-2	1,400
	Sulphate of potash	360	N-8-3	1,440
	Total	2,165		
	Average per acre			1,510

NEW BUILDINGS

TOBACCO CURING BARNS.—Two new curing barns, each 100 feet long by 30 feet wide, were built. These barns are of the same model as the one built in 1928 and have a capacity of 2,860 laths each. They were built as substantially and economically as possible; special attention was given to the devices used to open the ventilators.

As these barns can also be closed fairly tight, they will make it possible to carry on some experiments on the curing of tobacco.

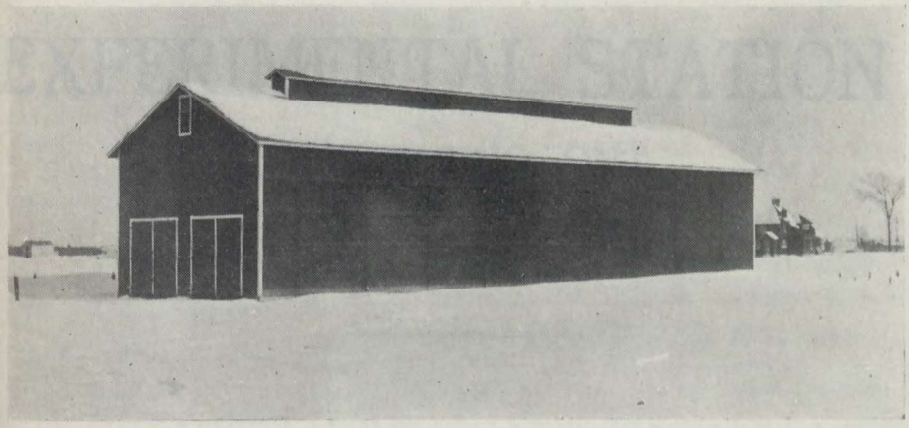
STRIPPING ROOM.—The stripping room built during the summer is a one-story high building, 40 feet long by 30 feet wide. The attic is used to store farm tools and the tobacco crop after it has been stripped, and also as a granary.

The stripping room accommodates 8 strippers and enough space is left for the installation of sorting tables and a baling press.

This stripping room has been built adjoining one of the curing barns so that the piles of tobacco can be carried directly into the stripping room without having to go outside the building at all. This arrangement is very handy. When the barn adjoining the stripping room has been emptied, tobacco piles from the other curing barns can be hauled on flat wagons or sleighs into that barn, and the piles of tobacco carried to the stripping room, as needed. This arrangement reduces handling of tobacco and consequently the cost of stripping.

BULL SHED AND PEN.—This shed, 9 feet wide by 11 feet long, has been built west of the cow barn. On the south side, a door opening in a large pen makes it possible for the bull to take all the exercise he needs.

HERDSMAN HOUSE.—The inside of the old farm house has also been put in shape during the summer. On the north side, parts of the foundations were caving in; these parts have been repaired. Parts of the sills have been replaced. On account of too weak girders and rotten supporting posts, the joists had sunk 7 inches in the middle of the house; posts on concrete foundations and new girders were put in. A new floor was made, some partitions taken down, a concrete floor was made in the cellar, new basement windows put in the foundations, the window sashes have all been repaired, a new stair built, a new sink installed in the kitchen and the whole inside of the house painted or papered.



Tobacco curing barn.

ASSISTANT'S HOUSE.—The foundations for this house were built in June, but as it was not possible to get the necessary plans before October 10, it was not before the end of December that the brick work could be finished and this added somewhat to the cost of this house. It is not quite finished yet but should be around the end of February. It is a nice looking bungalow, brick veneered, built to be very comfortable and with a hot-water heating system.

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