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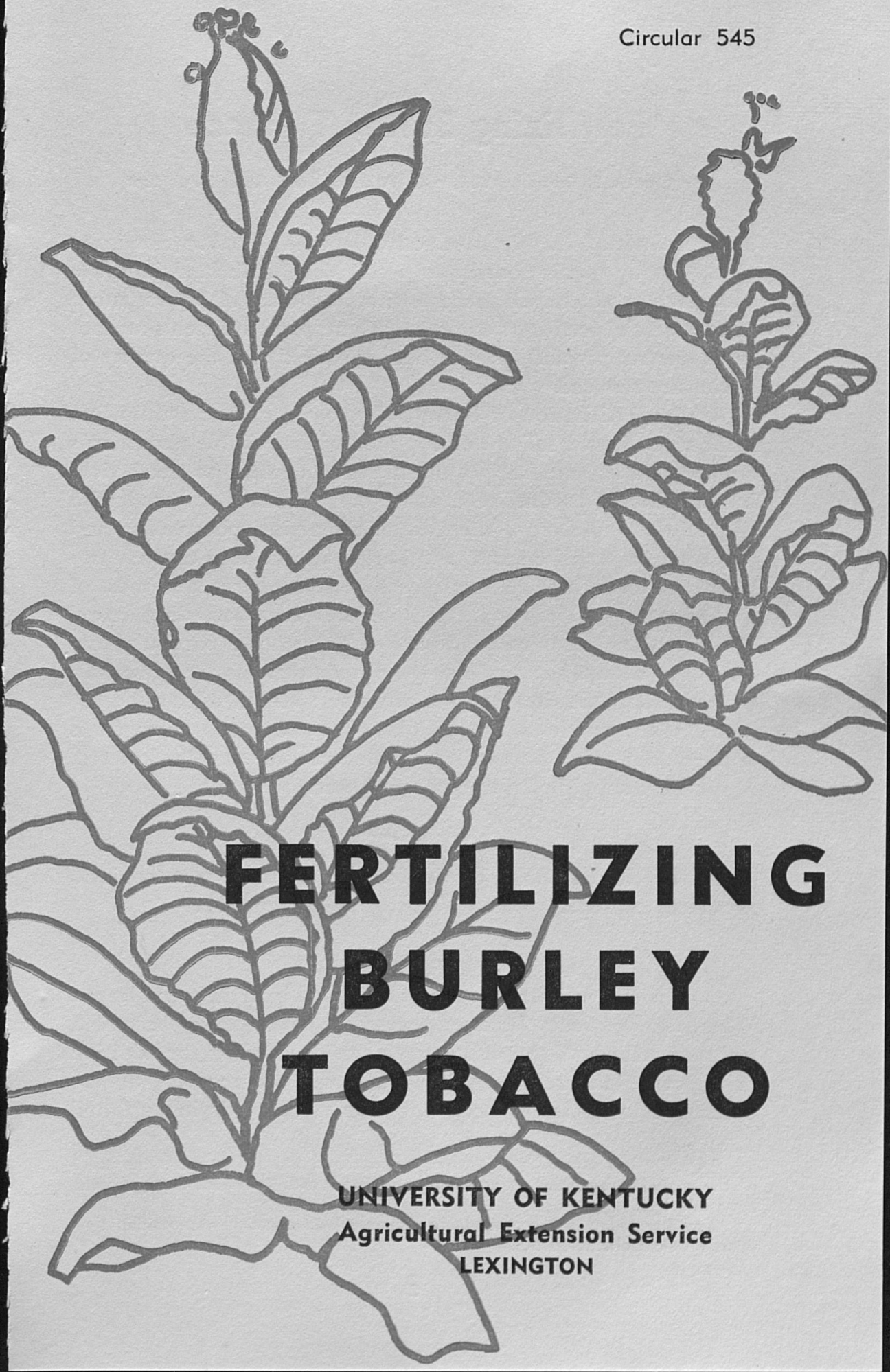

FERTILIZING BURLEY TOBACCO

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Fertilizing Burley Tobacco

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Well-drained, highly productive land is necessary for good yields of fine quality burley tobacco. Very little land is fertile enough to produce such tobacco without the use of farm manure or commercial fertilizers or both. Where plant nutrients are not in proper supply and balance both the yield and the quality of burley are reduced.

In the fertilization of burley tobacco the grower should first make sure that the soil is well supplied with available phosphorus and potassium; then supply the nitrogen needed for good yield but within the productive capacity of the soil. Compared with the value of the crop, the cost of supplying phosphorus and potassium in fertilizers is small. Larger applications of these two plant nutrients than the crop needs cause no harm, and most of the unused residue remains in the soil for succeeding crops. When making recommendations for the use of a particular nutrient one always assumes that the other nutrients are present in proper supply. A deficiency of any one nutrient affects the use of all other nutrients by the plant. If too much nitrogen is applied, however, the quality of the tobacco may be lowered. A very low supply of nitrogen also lowers quality.[1]

NITROGEN

A very important factor in fertilizing burley tobacco is to provide the proper amount of nitrogen for the crop.

Nitrogen Deficiency

A deficiency of nitrogen is first indicated by light green leaves. When the deficiency becomes severe the lower leaves become a uniform yellow. If the deficiency is not checked by the addition of nitrogen fertilizer the yellowing moves progressively up the plant, the lower leaves becoming nearly white, drying up, and

[1] Quality leaf as used in this paper is considered as leaf that meets the needs of the manufacturer; this is generally associated with thin-bodied, ripe, mild, flavorable leaf.

Usability today is becoming more dependent on chemical composition than upon physical characteristics.

wasting away. To cut such tobacco early to save lower leaves reduces yield and causes the immature leaves to cure red. If nitrogen-starved tobacco is left until the upper leaves are mature, high-priced lower leaves are lost unless they are primed. Lack of nitrogen reduces the yield and quality of much burley grown in Kentucky each year. However, an over-supply of nitrogen delays maturity and also lowers quality.

Sources of Nitrogen

Experiments with sources and amounts of nitrogen have been many and varied. They have shown, however, that while there are several good sources of nitrogen for burley, the amount is more important than the form in which it is applied. When properly used, nitrogen from any of the common fertilizers, from farm manure, or from legumes is satisfactory.

Amount to Use

It is difficult to make specific recommendations for amounts of nitrogen to be applied for burley tobacco. Needs must be determined on the basis of past cropping and soil management and by estimating what the yield will be if no nitrogen fertilizer is applied. When other growth conditions are satisfactory, burley yields should be increased about 6 pounds for each pound of nitrogen applied up to yields of about 1,500 pounds per acre. Progressively smaller yield increases per unit of nitrogen applied are to be expected as yield goes above this amount.

Though it is difficult to make specific recommendations for nitrogen applications, some guide posts in the use of nitrogen for burley may be set-up.

When good grass and legume sods, containing at least 50 percent legumes, are turned under for burley tobacco only about 50 pounds of nitrogen per acre is needed from commercial fertilizer or manure. As the proportion of grass to legume in the sod increases, the application of nitrogen will need to be increased. Seventy-five pounds of nitrogen per acre may be required where the growth of grass is still good, but where no legumes have been in the sod for several years. However, where a good stand of grass has been maintained for 6 to 10 years or more—even though the legumes have largely disappeared—not over 50 pounds of nitrogen would be necessary per acre. Where the pasture has run-out and the growth is mainly broad-leafed weeds, broom sedge and cheat, or where vegetation has repeatedly been eaten

down to ground level, 100-125 pounds of nitrogen per acre may be needed for good production. Under general farming conditions burley tobacco should not be produced on land so low in fertility that it will require the addition of more than 125 pounds of nitrogen per acre. Such land should be brought into a good state of productivity through cropping to grass and legumes, with proper fertilization and liming, before it is used for burley.

PHOSPHORUS

Need for Phosphorus

When there is a deficiency of phosphorus a good quality of burley cannot be produced. In the field, phosphorus deficiency in the tobacco plant is characterized by slow growth, abnormally dark green color, narrow leaves, increased space between the leaves on the stalk, and delayed maturity. In cured tobacco, phosphorus deficiency is reflected in low quality and a corresponding smaller percentage of tobacco that can be used in the manufacture of cigarettes.

For tobacco production practically all land in Kentucky outside the Bluegrass Region needs fertilizer containing phosphorus. In the Bluegrass Region most of the soils are medium to high in phosphate. On soils testing high in phosphorus, phosphate fertilizers are not needed for tobacco, but phosphate probably will pay on the medium-phosphate soils and will always pay on the low-phosphate soils. Soils that are high, medium, and low in phosphorus may exist on the same farm and can be detected only by a soil test. Relative to crop needs phosphorus is the cheapest of the three major fertilizer materials, and should be applied liberally for burley unless it is known that the crop will not respond to it. When there is sufficient phosphorus in the soil additional amounts do not affect yield or quality.

All of the phosphorus applied for a tobacco crop will not be taken up by the crop; some of it will be fixed in the soil and become unavailable. The amount that is fixed will vary with different soils. Some of the phosphorus will be used by soil organisms in breaking down the organic matter turned under and will be temporarily unavailable; some will remain available for future crops. The amount of phosphorus removed by tobacco is relatively small in comparison with the amount added to the soil. However, it is necessary to have a large supply available in

the soil in order that the tobacco crop can obtain the phosphorus it needs during its relatively short growing period.

Chemical tests[2] on soil samples properly taken from fields to be used for growing burley tobacco furnish valuable information on soil phosphorus content and as to the need for fertilization with this nutrient.

Amount to Use

When burley is grown in a rotation, phosphorus should be applied in accordance with soil needs as indicated by the soil test and the cropping and fertilizing history of the field. The amount of phosphate fertilizer recommended for some typical soil test situations and materials from which phosphate may be obtained for the immediate crop are given in Table 1.

Table 1.— Materials that may be used to supply the needed phosphorus* (expressed as pounds per acre)

Soil Test for Phosphorus	Pounds of Phosphate (P_2O_5) Needed	Pounds of Super-Phosphate to Use		Mixed Fertilizer 5-10-10 or 5-10-15**	6-6-18
		20%	45%		
Very low	160	800	355	1600	2700†
Low	130	650	300	1300	2200†
Medium	100	500	222	1000	1600
High	80	400	180	800	1400
Very High	none	—	—	—	—

* Where manure is used on tobacco land assume five pounds of phosphoric acid (P_2O_5) per ton available to the tobacco crop. The phosphorus needs can be reduced by this much per ton of manure applied.

** Potash in mixed fertilizer for tobacco to be in the sulfate form.

† This amount would supply the needed phosphate, but would over supply nitrogen. While a good fertilizer ratio this ratio analysis is suited for medium and high phosphate soils but not for low phosphate soils.

Use of Rock Phosphate

Recent experiments indicate that the phosphorus needs of burley tobacco can be supplied through the use of rock phosphate, provided it is properly used. Rock phosphate when used alone to supply the phosphorus for a burley tobacco crop should be applied at least 2 years ahead of the tobacco. If applied the same year that tobacco is to be grown, enough superphosphate should be used to supply the phosphorus for that crop. Rock phosphate applied just ahead of a tobacco crop would be of little, or no, value to the tobacco crop the year in which it was applied. How-

[2] For a nominal charge, these tests will be made (also tests for potassium and lime needs) in your county soil testing laboratory or, if your county does not have one, at the Kentucky Agricultural Experiment Station, Lexington. Extension Leaflet L-139 gives instructions for properly taking soil samples.

ever, the succeeding crops in the rotation would benefit from it as it slowly became available. Rock phosphate, to be fully effective, should be used in amounts to provide about three times as much phosphorus as would be contained in superphosphate or other manufactured phosphorus-containing materials. The treatment should be repeated at 4- to 6-year intervals.

It should be remembered that the phosphorus in rock phosphate becomes available more rapidly in soils that are moderately-to-strongly acid than in slightly acid soils or soils that are not acid.

A more detailed discussion of the use of rock phosphate is given in Kentucky Agricultural Extension Service, Leaflet L-114 "Phosphate Fertilizers."

POTASSIUM

Need for Potassium

Lack of potassium is a common cause of low quality tobacco. A deficiency of this element produces characteristic symptoms in tobacco plants. The leaves become distorted or puckered between the veins, the edges curl under, and a bronze yellow color appears at the tip and forward edges of the leaves. As the deficiency becomes more severe, the yellowing spreads and parts of the yellowed area may die and fall out. Cured leaves from plants deficient in potassium are heavy, dark, lack finish and elasticity, and may have a stubby appearance owing to the tips of affected leaves having fallen off in the field. All leaves on the plant may grade red. A good supply of potassium imparts general vigor to the plant and improves the burning quality and finish of the leaf. Whenever the burley plant shows potassium deficiency the quality of the plant has already been lowered.

Amount to Use

Apply potassium for burley tobacco unless it is known that the crop will not respond. The amount to apply will vary with past cropping and fertilizer practices. A soil test is very useful for determining the amount of potassium a soil needs. Additions may not increase the yield but may increase the value of the tobacco by many dollars per acre owing to improved quality. The amount of potassium expressed as potash (K_2O) to use to obtain the needed potassium will vary from none on soils where it is known that the crop will not respond to treatment to 250 pounds

per acre on soils that test very low in potassium. The amounts of potash recommended for some typical soil test situations and the fertilizer materials from which these amounts may be obtained are given in Table 2.

Table 2.— Materials that may be used to supply the needed potassium* (expressed as pounds per acre)

Soil Test for Potassium	Pounds of Potash Needed	Potash to be Obtained from			
		Sulfate of Potash	Mixed Fertilizer		
		50% K_2O	5-10-10	5-10-15	6-6-18
Very low	250	500	2500**	1666	1400
Low	200	400	2000**	1333	1110
Medium	175	350	1750	1166	972
High	150	300	1500	1000	832
Very High	125	250	1250	833	700

* Where manure is used on tobacco land assume that 10 pounds of K_2O per ton is available to the tobacco crop.

** This amount would supply the needed potassium, but in many cases would over supply nitrogen. If the 5-10-10 were to be used on soils testing low to very low it would be better to apply smaller amounts of mixed fertilizer and the remainder of the potash as sulfate of potash.

Use of Muriate of Potash

Potassium chloride (muriate of potash) is not recommended for use on burley tobacco. However, where tobacco is grown in rotation with other row crops, or grass and legume sods, the potassium needs of these crops can be supplied from the less expensive muriate form.

Muriate of potash should not be used on land during the late summer or fall preceding the burley crop.

Burley tobacco that contains excessive amounts of chlorine is very difficult to dry once it has come into case and when used in manufacturing, tobacco high in chlorine produces a harsh smoke.

USE OF FERTILIZER ON LAND USED MORE THAN ONE YEAR FOR TOBACCO

When land is used for burley production for several years in succession the operator needs to modify the fertilizer practices that are used when tobacco is produced in rotation with sod crops.

Nitrogen

When burley tobacco is grown on the same ground year after year with a small grain cover crop, but with no manure or tobacco stalks, an application of 100 pounds of nitrogen per acre should be sufficient. If the cover crop is small grain and a winter legume

(vetch or crimson clover) the legume may contain 40 to 60 pounds of nitrogen per acre. The fertilizer nitrogen application can be reduced by this amount. For example:

Cover Crop	Pounds of Nitrogen Needed Per Acre	Nitrogen Could be Supplied from Approximately
Small grain	100	300 lb. ammonium nitrate or 10 tons of manure + 40 pounds of nitrogen from straight materials or 2000 lb. of either a 5-10-10 or 5-10-15 or 1700 lb. of a 6-6-18 fertilizer
Small grain and winter legume	50	150 lb. ammonium nitrate or 8 tons of manure or 1000 lb. of either a 5-10-10 or 5-10-15 or 850 lb. of a 6-6-18 fertilizer

If the land has been used for several years for burley and has been liberally supplied with manure, tobacco stalks and commercial fertilizer there has probably been an accumulation of easily nitrifiable material. Consequently, the amount of nitrogen applied in the future can be reduced. Since there is no satisfactory soil test that can be used in the early spring to determine the amount of nitrogen that will be available for the tobacco crop, each farmer must decide for himself the amount of nitrogen to use on the crop. The decision should be influenced by the past treatment of the soil, the appearance of the cover crop at the time of plowing-under, past response of the crop to nitrogen, and how the crop ripened the previous season. If the crop ripened quickly after topping and made good tan leaf, the nitrogen supply was at the proper level. If the crop ripened very slowly and was predominantly heavy red tobacco, there was probably too much nitrogen. Another indication of the amount of nitrogen carry-over can be obtained from observing the recovery of small grain after pasturing. If recovery after grazing is rapid and the new growth is dark green the soil nitrogen supply is high and only moderate amounts of nitrogen need be added for the burley crop. If recovery from pasturing is slow and the plants are yellow, even though weather and moisture supply are good, the nitrogen supply is probably low.[3] If, on fields that are not pastured, the growth of the cover is lush and a deep green, the land will need only moderate amounts (not over 50 pounds of nitrogen per acre).

[3] Insects, particularly aphids, will sometimes turn small grain yellow. An inspection of the field will quickly tell whether insects are numerous on the cover crop.

Nitrogen fertilizers should not be applied to the cover crop until just before turning it under. If nitrogen is applied early in the spring a heavy growth of small grain is produced, but some, if not most, of the nitrogen is tied up in the cover crop. This nitrogen will not become available to the tobacco crop until the small grain is decomposed. This may be late in the season, when a large supply of nitrogen is undesirable.

If manure is used as the source of nitrogen it is best to apply the manure just ahead of plowing; however, this is not always possible as it may be necessary to make applications several times during the winter. If so, it would be better to make a light application over the entire field each time rather than heavy applications over a portion of the field. The latter practice could result in a very uneven growth of the small grain and a part of the cover crop being ready to turn under before other parts are ready.

Where a winter legume is used, the early application of nitrogen to the cover crop is quite likely to stimulate the growth of the small grain to the extent of smothering out the legume; also, the rank growth of the small grain may set up ideal conditions for the development of diseases which destroy the legumes. Then, too, the amount of nitrogen fixed by the cover crop from the atmosphere will be reduced. The time of application of phosphorus and potassium is not so critical, but the best time is probably just before turning under the cover crop.

Phosphorus

For the first crop, phosphorus additions would be in accordance to recommendations based on a soil test and the past cropping and fertilizing history. If the soil during the first year of burley production, tests very low in phosphorus the application should be 160 pounds of P_2O_5 per acre. The second year an application of 100 pounds P_2O_5 per acre should be adequate. Each year thereafter the application should be about 100 pounds P_2O_5 per acre until the soil tests high and 60-80 pounds thereafter until the soil tests very high. On soil that tests medium, an application of 80-100 pounds P_2O_5 should be made for the first crop. An application of 60-80 pounds P_2O_5 per acre should be made the second year and each year thereafter until the soil tests very high.

Potassium

The first application of potash should be on the same basis as for the treatment of land in a rotation, i.e., if the soil tests very low 200-250 pounds of potash (K_2O) per acre, if medium 150-175 pounds, if very high 100-125 pounds. The second year of burley the treatment should be at about the same rate, or possibly more, depending on the original level of potassium and the growth of the crop the previous season. In order to determine the available potassium supply, the soil should be tested at least every other year. As available potash accumulates in the soil the amount supplied by commercial fertilizers and manure can be reduced.

EFFECT OF NITROGEN FERTILIZATION ON CULTURAL PRACTICES

The handling of burley from topping through the curing of the crop is not, strictly speaking, a part of fertilization; however, the burley tobacco fertilization program on the farm sets up the details of the cultural practices that should be followed. When excessive nitrogen has been applied the crop must remain in the field an additional length of time to allow it to ripen. To cut such tobacco green to save the bottom leaves will produce a few good leaves on the bottom of the plant, but the remainder of the leaves will be immature and of highly questionable value to the manufacturer. Where excessive nitrogen has been used it may be necessary to prime the lower leaves if they begin to "lose." If the bottom leaves continue to waste while the upper part of the plant is still green, a second priming may be necessary. A good supply of nitrogen aids in retaining the bottom leaves. An excess, however, may delay maturity in the upper portion of the plant until the lower leaves have completely matured, and unless primed these leaves will be lost. Priming is the one means of being able to save the lower leaves while the remainder of the plant ripens. When burley has been over fertilized with nitrogen the grower must put extra thought and labor into his crop if he is to produce good tobacco.

The burley grower should keep in mind that **ripe tobacco is a necessity if a thriving burley industry is to be maintained.** Burley tobacco should not be harvested until it is ripe. The ripeness of the crop should determine the proper cutting date. The cutting date for too many burley crops is determined by

how long it has been in the field, or whether one's neighbors are cutting; these are poor methods of determining the harvest time of a crop as important as burley. Under any fertilization system, burley tobacco should not be topped until at least three-fourths of the plants are in bloom. Then top all the plants at one time. By topping all the plants at this time a more uniform ripening of the crop is obtained. There is also a saving of labor since only one trip over the field is required for topping the crop. After topping, suckering should be held to a minimum. Whenever it becomes necessary to sucker to prevent damage, the top sucker or two top suckers should be left on, thus retarding nicotine production.

USE OF MIXED FERTILIZERS

Where nitrogen, phosphorus, and potassium are needed, a mixed fertilizer may be used which contains all three. In determining the amount to use, estimate how much of each of these three plant nutrients is needed; then from the grades available select a fertilizer and a rate of application that will most nearly provide the nitrogen, phosphate and potash desired.

For example, consider that requirements are for 60 pounds nitrogen (N), 80 pounds phosphoric acid (P_2O_5) and 150 pounds of potash (K_2O) per acre, with the 5-10-10, the 5-10-15, and the 6-6-18 mixed fertilizers available. Twelve hundred pounds of the 5-10-10 would supply the nitrogen (5% N$\times$1200 lb.=60 lb. N); over-supply the phosphate, (10% $P_2O_5\times$1200 lb.=120 lb. P_2O_5) and under-supply the potash (10% $K_2O\times$1200 lb.=120 lb. K_2O). Similarly, 1200 pounds of 5-10-15 would supply the nitrogen, but over-supply the phosphate 40 pounds and the potash 30 pounds. A thousand pounds of the 6-6-18 would provide the necessary nitrogen but would under-supply the phosphate by 20 pounds and over-supply the potash 30 pounds. In this case the 5-10-15 would best suit the needs. The excess of phosphate and potash in the 5-10-15 ratio is not harmful to the crop and is not objectionable except for the increased cost. In other situations one of the other two might be better.

Mixed fertilizer high in phosphate and low in nitrogen and potash should not be used on medium-to-high phosphate soils because crop response on such soils will come almost entirely from nitrogen and potassium.

When using mixed fertilizers it is not always possible to obtain a mixture that will exactly fit the soil situation in regards to nitrogen, phosphorus and potassium needs. In making the final selection, remember that if the soil is deficient in phosphorus or potassium a rapidly growing crop of high quality cannot be produced. If nitrogen is deficient, the yield will be reduced while an over-supply may be injurious to quality.

When the proper amount of fertilizer to give the needed nitrogen has been determined and this amount of fertilizer does not provide the necessary phosphate or potash, the shortage can be supplied by the use of superphosphate or sulfate of potash. On the other hand, when the proper amount of fertilizer necessary to supply the nitrogen has been calculated and more phosphate or potash than was figured as necessary is included the excess will not be harmful to the crop. In like manner, if the fertilizer is calculated to give the proper phosphate and potash but does not give sufficient nitrogen, the additional nitrogen can be obtained from straight materials or from manure.

APPLYING FERTILIZERS

The two general methods of applying fertilizer are row and broadcast application. Each has a place in the fertilization of burley tobacco. The fertilizer by either method should be placed deep enough so that it will be in moist soil during dry periods and, hence, available to the plants. When applied along the row it should be close enough to the plants so that it will not be disturbed by later cultivation, yet not be directly in contact with the newly set plants.

Row Application

On productive land where small-to-moderate applications of fertilizers are used (less than 500 pounds per acre of mixed fertilizer) all may be applied along the row at, or near, the time the plants are set. On less productive land when larger amounts of fertilizer are used it may pay to apply up to 500 pounds per acre along the row and the remainder broadcast. On soils of low productivity this amount of fertilizer along the row may aid materially in promoting rapid early growth of the plant, however, on such soils this amount should not be expected to furnish the crop with sufficient nutrients during the later part of the growing season. Plant nutrients, particularly phosphorus, will be more

effective on the immediate crop when applied at the row than if applied broadcast.

Broadcast Application

When more than 500 pounds of commercial fertilizer is applied per acre (see row application above) all or part should be applied broadcast, particularly for a more even effect on succeeding crops. On highly productive land all the fertilizer may be applied broadcast. Fertilizer applied broadcast may be plowed under with the sod if the plowing is done after the first of April, or it may be disked or drilled in deep after plowing. However, even when carefully done, disking does not cut fertilizer into the soil to a depth of more than 3 inches. In dry years, this may not be deep enough for the plants to obtain full benefit from the fertilizer. When used alone, nitrogen is probably best applied broadcast and plowed under if the plowing is done after the first of April.

Side-dressing with Fertilizer

If nitrogen or potassium deficiency symptoms appear early in the growing plants, side-dressing with nitrogen or potash fertilizer gives good results. However, it is much more desirable to fertilize properly before setting since considerable care must be taken to keep the fertilizer off the plants. When the plants are not too large the fertilizer may be drilled on both sides of the row.

In side-dressing with nitrogen the more common practice is to broadcast the fertilizer between the rows and work it into the soil by cultivation. Nitrogen is very effective when applied in this way. When side-dressing with nitrogen, however, be careful not to apply too much, particularly when applied after the plants have made half their growth. **Additional nitrogen should not be applied until there is evidence of nitrogen deficiency.** Even though the crop starts off slowly, it is not advisable to apply nitrogen as a side-dressing unless the tobacco shows nitrogen starvation. Slow growth, particularly early in the season, often is due to causes other than lack of nitrogen.

Potassium is so important to the quality of the burley tobacco crop that it also may be profitably applied to potassium-starved tobacco. Potash may be applied at any time from the time of setting until the crop is too large for cultivation. However, potash is much more effective when applied before or at setting.

When side-dressing with potash the application should be larger than normal (probably about double the normal rate), because it cannot be applied at the depth desired nor as thoroughly mixed with the soil as would have been possible prior to setting. To attempt deep placement and good mixing after the plants are 12 inches or more in height would cause considerable root injury and further retard the growth of the plant.

Side-dressing with phosphate for burley ordinarily is not effective enough to be practical.

DON'T OVER-LIME

Excessive liming will reduce the availability of both phosphorus and potassium and most of the trace elements. High-quality tobacco grown on heavily limed soils is rare. Tobacco produced on such soil cures with the general characteristics of potassium-starved leaf though it may not have shown bronzing of the leaves in the field. Potash additions, adequate for normal liming, would be inadequate on overlimed soil.

Heavy liming may reduce soil acidity to a point where the minor nutrients that otherwise would be in good supply are changed to forms that cannot be used by the tobacco plant. Land where tobacco is grown in rotation should receive only the amount of lime necessary for the legumes in the rotation, usually ½ ton to 1 ton per acre every 3 to 4 years, and this should follow the tobacco.

On soils that are moderately-to-strongly acid it may be necessary to apply 2 tons of agricultural limestone per acre in order to establish a good stand of grass and legumes to build the land for tobacco. Once the proper initial liming has been made and the rotation established, liming as indicated in the paragraph above should be sufficient.

Land in continuous tobacco culture should be moderately acid and should be limed as necessary to keep it from becoming strongly acid. Usually a fall application of 1 ton every 4 to 5 years should do this. Not only is liming necessary for satisfactory growth of the cover crops, but tobacco may be severely injured by large amounts of soluble manganese and perhaps aluminum in strongly acid soils.

Manganese toxicity appears first as a light green or yellowish coloring between the larger veins of the leaf with, in some cases,

a gradual development of numerous dead spots. The symptoms usually appear first in the growing points of young tobacco leaves. In many cases of manganese toxicity the plants lose their toxic symptoms with good growing weather and appear normal. Quality, however, has been lowered and the plants contain abnormal amounts of manganese. Applying lime around the plants when the toxicity first appears has been ineffective. Liming with agricultural limestone at the rate of 1 ton per acre after the tobacco crop usually prevents recurrence of the toxicity the following year.

The development of soluble manganese in toxic amounts in the soil is usually due to an increase in soil acidity to the point that the soil tests strongly acid and to poor soil structure. If manganese toxicity has become a problem, it would be better to lime the land properly following the tobacco crop and seed it down for a few years rather than to attempt to crop it to burley tobacco continuously. Liming will reduce the available manganese, and the sod crops will improve soil structure so that within a few years the soil will be in better shape to produce good burley.

Follow Tobacco with a Cover Crop

Considerable soluble nitrogen (50 to 100 pounds per acre) forms in the soil in the fall after tobacco is harvested. Soluble nitrogen does not leach from most Kentucky soils during the summer but does leach out in most winters. Therefore, tobacco should be followed by a cover crop to prevent this leaching and to reduce soil erosion.

A cover crop of small grain or of small grain and winter legume should be used. On rolling-to-hilly land, to prevent soil erosion it is very important that a small grain be used and that it be seeded rather heavily. The greater the slope the heavier the seeding of small grain should be. When the small grain is seeded heavily in order to control erosion, a winter legume may be used with it but may not make enough growth to be profitable.

The kind of small grain used will depend on which one best suits the over-all farm plan for the crop—i.e., whether it is to be pastured and then turned under for green manure, or to be turned under without pasturing, or to be harvested for grain. Balboa rye is probably the most dependable small grain cover crop. Wheat and barley are good. However, barley requires a more fertile soil and an earlier planting date than rye or wheat

and is subject to severe winter damage in some years.[4] Regardless of which small grain is used and whether pastured or not, the crop, if it is to be plowed under for tobacco, should be turned under by the time the small grain is 18 to 20 inches high. At this height the small grain has its highest concentration of nitrogen, further growth merely adds strawy material which rots slowly. The rotting of such strawy material ties up much more soil nitrogen than does the rotting of material turned at 18-20 inches, and the amount of nitrogen available for the burley crop is reduced. Additional nitrogen which might be gained by longer growth of a winter legume would not provide enough additional nitrogen to compensate for the increased growth of the small grain.

BUILD SOILS FOR BURLEY

Soils of low-to-medium fertility should be built up for burley through the use of crop residues, farm manure, phosphate and potash fertilizers, liming, and growing grasses and legumes. Good crops of burley are more certain on land so improved, and only moderate amounts of fertilizer are required for burley on such land. On much tobacco land not only has it been necessary to add the fertilizers normally needed, but also enough additional plant nutrients to make up for the soil depletion by other crops grown in the rotation. A better plan in any soil-building program would be to apply enough fertilizers to the pasture, hay and grain crops so that they would not deplete the soil but rather would improve it and leave it in such condition that when tobacco follows in the rotation only moderate fertilization is needed.

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[4] For a more detailed discussion of small grains see Kentucky Extension Circular C-476, "Small Grain Production in Kentucky."

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