Tobacco growers' problems

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NOW that the 1953 tobacco sales are over, it has been realised by all connected with the industry that the production of low quality leaf does not pay. In this article an attempt is made to discuss the causes of four of the main types of unsaleable and low-grade leaf.

Most of the low-grade leaf produced in Western Australia comes under the following categories:

1. Salty leaf.
2. Immature green leaf.
3. Leaf grown on new land.
4. Leaf grown on dry land.

SALTY LEAF

The problem of salty leaf is a difficult one, but the production of large quantities of this type of leaf can be avoided. Many growers find it difficult to believe that their leaf is salty so I will first try to describe this type of leaf, although its ready recognition comes only with experience. The expert can even estimate roughly the percentage of salt in a certain type of leaf, by handling and inspecting it.

Salty leaf usually has a slaty, greasy appearance with a large number of minute grey specks distributed over the surface. Such leaves take up moisture readily and feel soft to the touch; they will not burn even by the use of a blow-lamp. To describe salty leaf in the growers' own language I would say that they would be admirable for tie-leaves, but don't use them even for this purpose.

Salty leaves should be discarded entirely during grading, and growers should not try to get rid of them in the lower grades of the crop, as a few such leaves in a hand are likely to be the cause of the bale remaining unsold.

This salt problem is peculiar to this State in Australia, and as far as I can learn is not encountered in other tobacco-producing areas. The average sample of leaf though it may be fairly high in salt content (about 2.5% in comparison with 0.7 to 1% in other areas) is not really objectionable. The serious objections come when the leaves have a sodium chloride (common salt) content higher than 3 to 4%. Fortunately, such a high salt content is rarely found in leaves above the cutter position on the plant. Owing to the high moisture content of the soil in the early stages of growth, the lugs and cutters take up a higher proportion of sodium chloride than the leaves higher up the plant.

Lug leaves are particularly susceptible, but in most seasons these bottom leaves are lost through blue mould infection. Owing to the low incidence of mould this year, however, many of these leaves were harvested instead of being primed off. This incidentally substantiates the case for priming in any season.

The provision of drainage in affected areas will do much towards reducing the chloride intake of the tobacco plant. The ideal is to have underground box drains, approximately three feet deep, spaced over the very wet areas. The effect of these drains will be to take away any excessive water which lies there during the winter months. Care should be taken, however, not to over-drain and thus cause the soil to dry out excessively.

Even open furrow drains on these areas will do much to prevent waterlogging. If drainage cannot be carried out effectively it will be advisable to move up out of these salty, swampy areas on to higher land. In some cases, irrigation may be necessary and a number of growers in the Manjimup district are now attempting supplementary irrigation with results which to date have been very satisfactory.

Much discussion has taken place concerning the most suitable depth to plough. In this district I am of the opinion that seven to eight inches is ample depth. Sinking the plough too deeply, causes the sour sub-surface soil to be brought to the top and this factor tends to aggravate the salt problem, as the roots of young transplants feed on this sour soil in the early stages and are thus liable to take up a higher percentage of salt in the bottom leaves.

Once the plant commences to grow, the roots penetrate to the sweeter soil which has been turned under, with the result that the higher leaves on the plant are lower in sodium chloride content.

IMMATURE GREEN LEAF

Many bales of immature green leaf remained unsold on the sale floor this year. It is a well-known fact that a crop of good tobacco in the field can be ruined in harvesting and curing, and the harvesting of immature leaf is costing growers a lot of money.

Why is this fault more prevalent in this State than anywhere else in Australia? In general, I think that the grower is too anxious to remove his leaf from the paddock to the bulking shed. To begin with, the optimum period for planting is in November. Earlier plantings do not usually do well since growth is too slow owing to the cooler weather. Plantings after the end of November are risky, since the chances of an early rain following in March before the crop is completely harvested are always great.

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If little rain falls during the early part of the growing period, and then heavy falls are received later on, a large quantity of the fertiliser again goes into solution and is taken up by the plants, causing the leaves to green up again, and harvesting is delayed. It is possible that this phenomenon did occur during the last season, causing a certain amount of the nitrogenous fertiliser to be leached out earlier leaving the phosphate and potash portions of the fertiliser in the soil. When heavy rains fell in February, this portion of the fertiliser was taken up by the plant and with insufficient nitrogen in the mature leaf, the cured leaf was inclined to be "boardy", and ripened falsely.

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Lug leaves do not develop the same degree of yellowing when ripe as those higher up on the plant and I think that, generally speaking, these leaves could be left a week longer before harvesting than is the case at present. After these pickings, and once the harvesting of the leaf commences, the grower should be more careful regarding the number of leaves he takes from each plant. Instead of say three leaves being picked, I think that two would be sufficient. As leaves higher up the plant are harvested, they should be allowed to develop a greater degree of ripeness than those towards the bottom of the plant. Whereas lug leaves are ripe when they still have a flat green appearance, top leaves and tips should be allowed to develop a distinct yellowish cast before they can be considered ripe. I still maintain that a ripe but sponged leaf will sell more readily than an immature green one.

Topping is practised very little in this State, but from trials which have been carried out over a number of years, results obtained have shown that it is beneficial to top the plant after the bottom leaves have been harvested. This operation certainly delays harvesting for up to a week, but ripening thereafter is quicker and more uniform.

Naturally a thick heavy crop should not be topped, but I feel that in the majority of cases it would be advantageous. Top suckers can always be allowed to grow if the crop is a little late in ripening. Even if this is done, the initial setback received by the plant after topping will help to develop the top leaves.

A number of growers over the past few years have grown tobacco on old pasture land which carried a heavy leguminous crop of clover or Giblett grass (Lotus minor). Leguminous plants develop root nodules which have the capacity of absorbing free nitrogen from the atmosphere, and over a period of years, the amount of nitrogen added to the soil by this means is considerable.

A crop of tobacco grown immediately after a heavy legume crop, and with normal application of standard fertiliser, naturally has too much nitrogen and the crop will not ripen properly. When harvested, the leaf is either green or papery, since the ratio of nitrogen to sugars is upset.

When this type of country is to be used, my advice is to first grow a crop of potatoes, which will remove a quantity of nitrogen. The fertiliser applied for the following tobacco crop should be made up by the farmer himself using these ingredients per acre:

<table>
<thead>
<tr>
<th>Fertiliser</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superphosphate</td>
<td>773 lb.</td>
</tr>
<tr>
<td>Sulphate of Potash</td>
<td>140 lb.</td>
</tr>
<tr>
<td>Nitrate of Soda</td>
<td>100 lb.</td>
</tr>
</tbody>
</table>

Sulphate of ammonia has been omitted from this mixture, since this ingredient does not have an effect on the plant until approximately three weeks after planting and is then available throughout the growing period. Nitrate of soda, on the other hand, is available immediately and gives the plant its initial start in growing. It is quickly leached out of the soil but the nitrogen already in the soil from the legumes then feeds the plant throughout the remainder of the growing period which is much better than having an excess of nitrogen supplied by the inclusion of sulphate of ammonia in the fertiliser.

**LEAF GROWN ON NEW LAND**

Growing tobacco on newly-cleared ground has always been a difficult problem in Western Australia. If the crop has to be grown on land which has been cleared during the previous season, it is advisable to work it well and to sow a green crop of peas or lupins in early April. However, the wisest policy to adopt is to first grow a crop of potatoes before tobacco is planted. This enables the soil to be thoroughly worked and aerated, and when followed by a winter green crop, the humus content of the soil is built up.

"New land" tobacco has typical characteristics in that the leaf produced is generally hard and close-grained, and in many cases has a slaty, grey appearance which however is distinct from that caused by salt.

This discolouration can be eliminated to a large extent by the application of No. 2 fertiliser, which contains copper and zinc. It has been shown that a deficiency of zinc can cause this grey colour in many crops.

The "boardiness", is not so readily dealt with. From my experience, this is caused by lack of aeration, and shortages of humus and nitrogen. When a soil has been covered by virgin forests for hundreds of years it stands to reason that free circulation of air through the soil structure has been limited.

It is well known that the tobacco plant requires a friable well-aerated soil for optimum growth. In most new land the distribution of humus through the top 12 in. of the soil is not great. There is generally a layer of organic matter on the surface and the initial ploughing does not distribute this evenly throughout the soil. Humus in the soil greatly assists in both aeration and moisture holding capacity. When we plough in a winter green crop, it is well distributed through the soil to the depth of ploughing and thus improves soil structure. As mentioned previously I think that ploughing to a depth of seven to eight inches is ample before planting, otherwise the sour sub-soil may be brought to the surface. Tobacco is a surface
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feeder and the numerous fibrous roots only penetrate to a depth of about six inches so there is no sound reason for deep ploughing to a depth of 12in. to 14in.

The purpose of sowing a legume as a green manure crop is to enrich the soil with nitrogen. As mentioned previously tobacco grown on clover land carrying a lot of nitrogen cures out "papery". The reverse appears to be the case where new land is concerned and observations suggest that increasing the nitrogen content of new land will decrease the amount of boardy leaf generally harvested. Trials will be conducted this year to prove this point.

LEAF GROWN ON DRY LAND

The ready recognition of soil which is too dry to grow a tobacco crop comes only with experience. One redeeming feature of growing on land which is too dry is that the salt content of the leaf is lower. Where irrigation is possible on such land, the appearance, smoking and burning qualities of the leaf produced are excellent.

When soil tends to dry out after the commencement of harvest, it has been found that it is an advantage if the crop is topped rather high and kept suckered. This improves the quality of the leaf.

This practice does however tend to cause leaves towards the top of the plant to fire, and it is not advisable to pick this leaf. Keeping the crop free of weeds and well cultivated in the early stages of growth will help to conserve the moisture present in the soil.

I would welcome any discussion on the foregoing points and would like to hear of growers' own experiences in this field.

ADVICE BY AIR

By J. R. M. WOLFE, B.Sc. Agric., Agricultural Adviser, North-West Branch

HERE in the north, it is a long way from station to station. Roads, for the most part, are poor and rough, and very often the road mileage is very much greater than the distance as the crow flies. Light aircraft are able to save an enormous amount of time under these conditions. For advisory work in the spinifex area, a Tiger Moth aircraft was purchased and helped to solve the transport problem. Today, instead of being a dirty and uncomfortable necessity, travelling has become a pleasant recreation.

Aircraft have many other uses besides straight-out travel from point to point in these parts. When dingoes are troublesome, particularly in a dry season such as the present one, a knowledge of the local natural waters is of great help to station managers on their dingo-destruction campaigns. Very often station men are unable to cover their hilly country to search for water-holes which dingoes may be using and it is here that a quick trip in the Moth has often had considerable value. On one station, eight water-holes, previously unknown, were found in this way.

On large stations, especially under drought conditions, the rapid pin-pointing of areas in which rain has fallen from thunderstorms is obviously desirable so that weak sheep can be moved to a better pasture. Half an hours' flying can often give this information accurately.

Spotting sheep for mustering is another service which a light aircraft can render satisfactorily. This is a fairly common practice in the Murchison but has not been tried to any great extent in this area. Sheep can be very easily seen from a height of 500 feet and can be started moving in the required direction by the sound of the aircraft.

Visiting departmental officers can be taken to more stations in the limited time at their disposal, and can travel in much greater comfort. Where extension services are almost non-existent, largely due to the widely-scattered stations, it is felt that the use of aircraft can provide a means of overcoming many of the problems which arise in establishing a pastoral advisory service.

In addition the author has carried out a few flights as emergency pilot in the aircraft maintained by the Flying Doctor Service and a complete compass of the zone has been made in the 15 hours spent piloting this machine.

The writer of this article, is an Agricultural Adviser with the North-West Branch, and purchased his own Tiger Moth aircraft in September, 1952. A qualified pilot, he preferred flying to road travel, and the Department of Agriculture agreed to co-operate by paying mileage allowance for departmental flights in the same manner as for officers using road vehicles.
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