Tobacco seed-bed management

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SEED-BED MANAGEMENT

by A. E. BAKER, Tobacco Adviser

A SUCCESSFUL tobacco crop depends initially on an ample supply of well-grown, disease-free seedlings available early in the planting season. If planting is held up due to a poor supply of seedlings, the resulting crop will not be grown in the most favourable part of the season. Late-grown crops nearly always give low returns.

In determining the site for seed-beds, the availability of water should be considered. A good supply of water which can be used from a hose is essential for the production of tobacco seedlings.

Seed-beds should face approximately north-east so as to benefit from the greatest amount of sunshine. Protection from prevailing southerly and westerly winds is also an advantage in keeping the soil warm.

The desirable soil for seed-beds is a friable sandy loam; most tobacco soils are suitable for this purpose.

Most seed-beds are constructed with timber frames about 16 ft. in length and 3½ ft. in width. Larger sized beds may be used though anything over 4 ft. in width is inconvenient to reach over when applying benzol and handling the plants.

Unbleached calico covers fitted to wooden or pipe rollers are used to confine the benzol vapour and to protect the seedlings from frost or heavy rain.

SOIL PREPARATION

It is an advantage to treat the soil for the control of weeds, nematodes and diseases prior to sowing. One of the most effective agents for controlling weeds, nematodes and diseases is the gas, methyl bromide. This chemical can be purchased in 1 lb. tins and is used at the rate of 1 lb. per 100 square feet of seed-bed area. Thus two 16 ft. x 3 ft. beds could be treated with one pound of methyl bromide. To apply this gas to the soil a plastic sheet is laid over the seed-bed frame and the edges of the sheet are covered with soil in order to make a gas-tight seal. By
means of a rubber tube which is passed under the plastic sheet and an adaptor which fits onto the can of methyl bromide, the gas is released under the cover.

The plastic cover, which holds the gas in contact with the soil, is left in place for 24 hours if the weather is fine and the soil is not too wet, or for 48 hours if the weather is cold and the soil is over-moist. At the end of this period, the sheet is removed and the bed can be planted after 48 hours exposure to the air. The one plastic cover may be used in rotation for treating all the beds.

Higher rates than 1 lb. of methyl bromide per 100 square ft. of bed may be used if the beds sizes and plastic sheet sizes do not work out evenly. The range between 1 lb. of methyl bromide per 100 square ft. and 1 lb. per 50 square ft. is satisfactory except that the higher rates are more expensive.

If care is taken to see that there are no sharp corners or nails on the seed-bed frames which would puncture the plastic sheet, such a sheet should last for several seasons.

Warning.—Methyl bromide is a poisonous gas and should be handled carefully. Do not breathe the vapours. Each can of methyl bromide contains tear gas which causes the eyes to burn, and this serves to warn of gas leakage during storing or handling. Be sure to read directions on the can before applying methyl bromide.

Other seed-bed treatments which are sometimes used are formalin and allyl alcohol. Formalin is useful for the control of soil-borne diseases but controls weeds and nematodes only to a limited extent. Allyl alcohol is only useful for the control of weeds.

FERTILISER

Many growers in the past have used far too much fertiliser on seed-beds and this has caused widespread seedling injury.

Before planting the beds, a dressing of 1 lb. of low potash (5.7 per cent.) tobacco fertiliser or potato manure “B” should be applied per square yard of soil. The correct quantity of fertiliser per bed should be weighed out so as to ensure that the right amount is applied. Thus a 16 ft. x 3½ ft. bed having an approximate area of six square yards will require 9 lb. of fertiliser.

The fertiliser is spread evenly over the surface of the bed and mixed into the top two or three inches of the soil. Deep digging in of this fertiliser should be avoided otherwise the seedling roots may not reach the fertiliser and the resulting growth will be poor.

SEEDING

As a result of poor germinations in the past, growers continue to plant tobacco seed at very heavy rates in order to overcome this trouble. Poor germination has usually been caused by the use of too much fertiliser or by dry soil conditions or a combination of both these factors.

If seed-beds are managed properly, a good stand of plants may be obtained by sowing not more than 1 oz. of tobacco seed per 100 square yards. With a bed 16 ft. x 3½ ft. having an area of 6 square yards, a level teaspoon of seed is sufficient. This seed is mixed with clean sand or fine wood ash and sprinkled evenly over the whole bed. The back of a rake may be used to press the seed into the soil and to firm down the top of the soil.

It is an advantage to spread a thin layer—no more than ¼ in. thick—of clean coarse creek-bed sand over the surface of the bed to cover the seed. This coarse sand protects the germinating seed from drying out and also prevents it from being washed out by heavy watering. It is worth remembering that sand which is used to mix with the seed for sowing and sand used for covering the seed should be treated with methyl bromide, otherwise weeds and disease organisms may be introduced into the clean beds. A small heap of sand for this purpose may be placed next to one of the beds and treated with methyl bromide at the same time as the bed is treated.

CARE OF SEED-BEDS

Watering.

Probably the most common cause of failure with tobacco seed-beds is in not keeping the soil surface sufficiently moist during the germination period.

As it takes approximately three weeks for tobacco seed to germinate in July at Manjimup, the soil surface must be kept moist during the whole of that period. In fine windy weather, frequent light waterings by hand hose will be necessary.
**Benzol.**

In the Manjimup district, blue mould seldom attacks seedlings earlier than three weeks after germinating. When the seedling plants are about the size of a threepenny piece, benzol should be used in the beds every night.

The evaporating tins used to hold the benzol should not be deeper than one inch and about 3 to 4 in. wide. The full treatment should consist of one square inch of benzol surface to every 100 square inches of seed bed area. Thus a 16 ft. x 3½ ft. bed will have an area of 8,064 square inches. Divided by 100, this equals 80 square inches of benzol surface required.

If three-inch diameter round tins are used, each will have an area of seven square inches. Then 80 divided by 7 indicates that 11 tins are required for each seed-bed.

In the early stages, when the seedlings are young, they should not be subjected to the full benzol treatment otherwise injury will occur. Begin with half the number of tins per bed, and gradually increase the number as the seedlings grow. Benzol in the liquid state is fatal to seedlings and the greatest care should be exercised to prevent spilling or splashing when the tins are being filled.

**Diseases.**

In addition to blue mould, the next most common disease occurring in seed-beds is damping-off. This fungal disease attacks the seedlings at ground level and may also be associated with various root-rotting organisms. One of the most common causes of this disease is overcrowding of seedlings due to too much seed being planted. By fumigating the soil prior to planting; by not sowing the seed too heavily, and by allowing the beds to remain open to the sun and air during the growth of the seedlings, much of the risk of damping-off disease will be overcome.

A further operation in the prevention of damping-off or in the control of the disease if it does occur, is the use of Cheshunt mixture. One ounce of Cheshunt mixture is dissolved in two gallons of water and this solution is watered onto the beds. This solution should be washed off the leaves with clean water in order to prevent burning. Cheshunt mixture may be used twice weekly if damping-off is prevalent in the seed-beds.

As Cheshunt solution attacks galvanised watering cans, it is advisable to use a copper or plastic watering can for the application of this chemical.

Mosaic disease is frequently present in manufactured tobacco so that people who smoke often infect seedlings with their hands. Before any seedlings are handled or pulled, the hands should be thoroughly washed with soap and water. Do not smoke whilst handling or pulling seedlings.

**GROWTH OF SEEDLINGS**

If seedlings are backward in growth or inclined to be yellow, they may be helped with some liquid manure. For this purpose a small handful of nitrate of soda or sulphate of ammonia mixed in four gallons of water may be watered on to the beds. Immediately after this treatment, the beds should be watered with plain water so as to wash the fertiliser off the leaves. Urea may be used instead of nitrate of soda or sulphate of ammonia, to stimulate growth of the seedlings. As urea has twice the quantity of nitrogen as these other fertilisers, only half the quantity should be used at a time. A heaped tablespoon of urea in four gallons of water should be sufficient.

Seedlings should be hardened off by reducing the watering during the week or so before planting out in the field. By allowing the seedlings to wilt a little in the beds at this stage, they will be toughened up and then will be more able to withstand the shock of transplanting in the field.

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