

LOWLANDS COVER CROPS

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A cover crop is a crop that is planted to keep out unwanted plants, especially grasses, or to cover the ground so the soil is protected from the rain and sun. In Papua New Guinea we are usually more worried about keeping out unwanted plants because some plants will always grow to protect the soil. Perennial grasses such as kunai can use a lot of food in the soil. If they are growing with a plantation crop, they can stop the plantation crop growing properly. Grasses are difficult to remove when land is needed for gardens and can ruin a garden if they are not removed properly.

Cover crops are not a new idea in Papua New Guinea. The best cover of all is a forest of large trees, and this is what gardeners traditionally use. A forest cover keeps out grasses and other weeds; it keeps the soil cool; it helps stop rain washing the soil away or sliding downhill in a landslide; and it gives plant food back to the soil, especially when the forest is burnt to plant a garden or a plantation. These are all the things we want a cover crop to do.

However there are many places where a farmer cannot use a forest cover or fallow. Some of these are:

1. For a fallow where machinery is being used to cultivate the soil. The stumps and roots of a forest fallow make it very difficult to dig the soil with a plough.
2. In between the trees of a plantation. Nobody wants bush growing between his coconuts or coffee!
3. In between crops in a rotation. For example in a school garden over the Christmas holidays if there are no crops being grown.
4. After the forest or grass fallow is cleared but before a crop is planted.

Cover crops are widely used in agriculture in cool climate countries, but they have more disadvantages in the wet tropical places like PNG. Some of the disadvantages are: It takes work and time to plant them and to keep the cover crop from being covered by fast growing weeds. The farmer usually is not getting anything to eat, use or sell from his work. It is also hard work to remove a cover crop when necessary.

Instead of a cover crop, farmers can sometimes plant a useful crop. Remember food crops can be planted between plantation

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crops before the plantation crop shades out the soil and sometimes after they shade out the soil. A useful crop, such as sweet potato or pumpkins, might do the job as well as one that gives no food, such as puero.

Which cover crop should a farmer use for the times when one is really needed, such as in a large plantation or when the ground is under fallow and machinery is used for cultivation? Legumes that creep along the ground are the ones usually used, but other crops can also be used. Tolai farmers sometimes plant sweet potato as a cover to keep kunai out of young cocoa plantations. Legumes are used because they get their nitrogen (an important plant food) from the air, not the soil. So they don't use up the soil's nitrogen and they put some nitrogen into the soil from the air. Between 1970 and 1974 a study was done at the Lowlands Agricultural Experiment Station to find out the best legume cover crops for the PNG lowlands. These were the results:

Puero was the best legume that creeps along the ground and calopo was also good. Puero lasts many years. It is often planted in large plantations between the tree crops. Calopo does not last as long but it covers the soil faster than puero. Where a cover is only needed for a few months, it is better to use a crop that grows quickly and covers the ground in a few weeks. The crops that do this do not live as long as puero or calopo. The best ones are cowpea and velvet bean. Where a cover is needed that grows into small bush, Schofield stylo is the best one to grow.

Sometimes a tree cover is needed to really keep down the weeds. The best ones are flemingia and *Tephrosia candida*, but they live so long it is difficult to remove them. Pigeon pea and *Crotalaria goreensis* do not cover the soil as well as flemingia and *Tephrosia candida* but they are quick growing, short lived and easier to remove. The seeds of cowpea and pigeon pea can be eaten so these two crops can be providing food at the same time as they cover the soil.

How does the farmer get rid of the cover crop when he wants to plant something else? Sometimes books say it's best to dig it into the soil. That's all right if you have a large tractor and plough or 50 labourers and if your cover crop did not grow really well. But for most PNG farmers, the easiest way is to cut it and burn it when it has dried. If the farmer cannot burn it because the cover crop is planted in with a plantation crop, then he must dig it in if he can or else carry it to another area.

Small amounts of seed of flemingia, *Tephrosia candida*, and pigeon pea can be obtained from LAES, Keravat; velvet bean is available from D.P.I., Laloki; and the Faculty of Agriculture, UPNG has seed available of a good variety of cowpea; and Schofield stylo must be purchased from an agricultural supplier such as New Guinea Pastoral Supplies in Lae or Elvee Training Company in Rabaul.

FURTHER READING

Bourke, R.M. (1975). Evaluation of Leguminous Cover Crops at Keravat, New Britain. *Papua New Guin. agric. J.*, 26(1);1-9.

