

A REQUIREMENT FOR CHILLING TO INDUCE FLOWERING IN *DOLICHOS LABLAB* cv RONGAI

G. D. HILL.*

ACCORDING to von Schaaffhausen flowering of *Dolichos lablab* is more dependent on photoperiod than on temperature. This was not found to be the case in extensive acreages of *Dolichos lablab* cv Rongai which were planted in the Morobe District of New Guinea during 1966.

Three hundred and fifty acres were sown in the Markham Valley between Munum and Kaia-pit (Latitude 6 degrees south) and fifty acres were planted at Sunshine near Bulolo (Latitude 7 degrees south) between December, 1965, and April, 1966. Differences in photoperiod between the two locations would not have exceeded two minutes per day. It could therefore be assumed that marked differences in time of flowering would be due to factors other than photoperiod.

Flowering was first observed at Sunshine (elevation 2,000 ft.) on the 29th April, and generalized flowering had commenced on this site by the end of May.

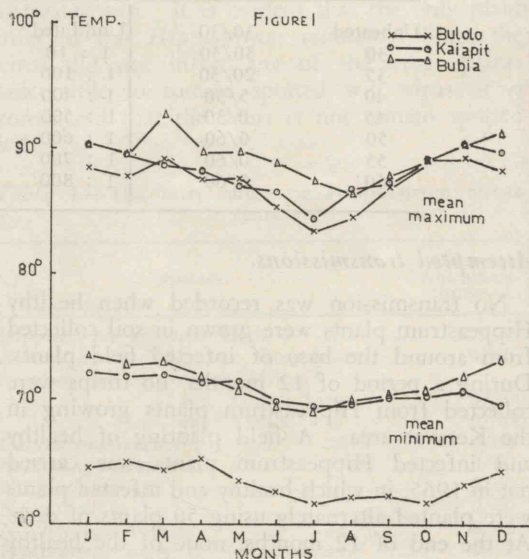
At all other locations no flowers were observed until the 6th June. Date of planting made little difference to commencement of flowering at any site.

At only three locations in the Markham Valley, which were very dry, was flowering at all extensive. At all other sites, the crop continued to make luxurious vegetative growth producing only occasional flowers in areas where it appeared the plants were water-stressed.

It would appear that as this particular strain of *Dolichos* was introduced from the Rongai district of Kenya, near the equator, for flowering in low tropical latitudes, one of the two following requirements must be fulfilled:—

1. Low night temperatures, allowing a certain amount of chilling. Mean maximum and minimum temperatures for Bulolo (similar to Sunshine) and two locations in the Markham Valley are shown in Figure 1.

* Agronomist, Department of Agriculture, Stock and Fisheries, Buba, Lae.



It will be seen that although there is little variation in the mean maximum temperatures at the three sites, the mean minimum temperature at the higher altitude is consistently from seven to nine degrees cooler than in the Markham Valley.

Britten has shown that in Hawaii non flowering clones of *Trifolium repens* could be induced to flower if grown in a similar temperature regime to that found at high altitudes. It would appear that a similar mechanism is in operation here.

2. In areas of the Markham Valley where the crop did flower there was a marked dry spell and plants became water-stressed. The setback was evidently sufficient to induce spasmodic flowering.

IMPLICATIONS.

It would appear that although this plant is an excellent forage legume at low altitudes in the Territory, if seed production is required planting

in areas which have mean minimum temperatures above 64 degrees F. could not be recommended. Successful seed production at low altitudes would depend on the occurrence of an extended dry period sufficient to prevent all vegetative growth.
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REFERENCES.

- ANON. (1964). New plants for northern pastures. *Rural Research in CSIRO*, No. 64 : 13-17.
- BRITTEN, E. J. (1960). Genetic and environmental control of flowering in *Trifolium repens* in the tropics. *Science*, 131 : 100-101.
- SCHAAFFHAUSEN, R. V. (1963). Economic methods for using the legume *Dolichos lablab* for soil improvement, food and feed. *Turrialba*, 13 (3) : 171-179.