Peanut as a dual purpose crop

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A characteristic of older types of peanut (Arachis hypogaea L.) is a low harvest index. (1). We presumed, from this, that there was a possibility that some of the "surplus" vegetative material could be removed as forage, which, being from a legume, should be high in nitrogen. The results presented here were gathered from field and pot experiments carried out at Camden, N.S.W. (34?S) over three years.

Given that confectionery grade kernels would remain as the primary product, we first determined what management system would maximize this. The crops were irrigated, well-fertilized and planted at an optimum time. We found that 75cm rows and a population of 4 x 105 plants ha-1 gave us best pod yields (3.8 t ha-1 of oven-dry nuts in shell).

Forage quality was determined primarily by the leaf/stem ratio, which declined steadily from 1.28 at 4 weeks to 0.40 at 23 weeks. N content of leaves and stems was approximately constant from 10 weeks on (2.5 and 1.1% respectively), but the changing L/S ratio reduced total shoot N content from 1.8% at 10 weeks to 1.3% at 23 weeks. The in vitro dry matter digestibility declined from 80% at week 10 to 60% at week 23.

Pod yield after cutting was reduced by less than 10% for cutting up to week 10 (pod formation), when yields of 2.1 and 2.4 t ha^{-1} of oven-dry nuts-inshell were obtained in two years. Cutting at week 12 reduced pod yield by approximately 40% and at week 14 by 50%. Forage yield increases as cutting is delayed, so an optimum time of cutting is 10 weeks, when forage yields of 1.4 and 3.2 t ha^{-1} were removed in the same two years as above. A pot experiment showed that cutting more than once in the season reduced both forage and pod yield.

Other experiments showed that the poor pod recovery after cutting later than 12 weeks was due, effectively, to the presence of rapidly filling pods on the plants which prevented adequate shoot regrowth and inhibited formation of later pods.

Physiologically, the experiments have given an insight into the mechanism of yield production. Yield improvement will follow from an increase in pod number m^{-2} (see (1)), but the asynchronous flowering pattern and surplus leaf production provide definite buffers against environmental hazards. Agronomically, we have shown the feasibility of removing forage at pod formation, but feel that the system is probably better suited to cut and carry systems with cheaper labour than Australia.

1. Duncan, W.G., McCloud, D.E., McGraw, R.L. and Boote, K.J. 1978. Crop Sci. 18:1015-1020.