Pulses – A Complementary Crop for Rice

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In an integrated food and nutrition strategy there is an urgent need for the cultivation of rice and pulses as complementary rather than competitive crops. Pulses provide an inexpensive source of protein, and in combination with rice counteract deficiencies of lysine and methionine in the local diet.

Unfortunately agricultural policy has concentrated only on increasing the output of rice, while neglecting the pulses which were imported cheaply mainly from India and other countries. A recent government ban, however, on the import of green gram, black gram, groundnut and cowpeas, and a gradual restriction in the import quotas of lentils and pigeon peas have given the farmer the necessary incentive to produce these pulses locally.

Grow improved varieties

The first consideration in any pulse development programme would be the use of improved varieties, which have been bred for a higher harvest index in a shorter space of time. Such varieties are now available from the Department of Agriculture. The best known are MI-I, MI-4 and Type 59 green gram, MI-I and Type 9 black gram, MI-35 cowpea, PB-I Improved Pelican and Bragg soyabean and MI-I and SAA6 groundnut.

Three of these in particular, namely, MI–35 cowpea which is a popular substitute for the imported Masoor dhal, and MI-4 and Type 59 green gram may be harvested in 60–70 days, and yet their yields are superior to the indigenous varieties.

Apply phosphate Fertilizers

The benefit of the high genetic potential of these improved varieties, however, cannot be fully realised unless, the farmer is prepared to give them a higher standard of management than he has been accustomed to in the past.

The fact that pulse crops have been grown in marginal land does not necessarily mean that these crops are unresponsive to fertilizers. On the contrary, the improved varieties show a marked response to fertilizers, specially in soils of poor fertility where a starter dose of at least ½ cwt. of concentrated superphosphate and ½ cwt. of urea (per acre) are essential.

Unlike most crops, pulses do not require too much nitrogenous fertilizer because it discourages rhizobia formation — that is, the development of nitrogen-fixing bacteria in the root nodules — and this in turn results in poor growth. Phosphate however is very essential to promote rhizobia development.

Rotate pulses with rice

With the availability of improved varieties and a government scheme of subsidized fertilizers, the time is ripe for pulses to be included in an intensive cropping pattern with rice. The short - duration varieties in particular may be cultivated successfully in paddy fields as relay crops at the tail end of a rice crop, or as sandwich crops in between two seasonal crops of rice. The short age and small water requirement of these varieties makes this a feasible proposition.

In fact, this characteristic of low water requirement may be further exploited by using these pulses to replace rice in places where this staple cannot be cultivated owing to a shortage of water. In the dry zone, there are several thousands of acres of paddy fields which are allowed to lie fallow during the *yala* season for this reason. There are about 200,000 acres in the Anuradhapura and Kurunegala Districts alone. This is a disproportionately large extent of land which is allowed to lie idle when a considerable portion of it could be profitably cropped with pulses utilizing small amounts of " tank " or well water.

Crop diversification of this nature is very essential if we are to make maximum use of our limited land resources and also the best use of expensive fertilizers. The pulses derive the cumulative benefit of the phosphorous and potassium fertilizers given to the previous rice crop. Being legumes they also manufacture a certain amount of nitrogen with the assistance of nitrogen - fixing bacteria. Any excess is available to the following rice crop when the stubble of the pulse is ploughed in at the end of the season.

There are fringe benefits too. The rice crop benefits from the intensive weeding that is given the preceding pulse crop, in the sense that it has less weeds to bother it than had the fields been left fallow.

A word of warning though! The rice farmer who takes to cultivating pulses in his paddy fields is prone by force of habit to flood the fields. The water is let in and allowed to stand for long periods in the *liyaddas*. While this is alright for rice, it is detrimental to pulse production. Pulses, which are extremely sensitive to even temporary water - logging, receive a serious setback in growth. Or, in the case of MI-35 cowpea the plants often run to leaf at the expense of pod production. The ideal pattern of irrigation therefore would be several light irrigations every 10–14 days instead of flooding.

The rice farmer who takes to pulse production is also liable to be caught napping in the matter of weeding. Accustomed as he is to controlling weeds by flooding his fields, he tends to forget that when several light irrigations are given, weeds spring up much faster than usual. If these weeds are not eliminated during the first month the ultimate yields will be low.

Reap rich rewards

But is it worth it? Will the return from pulse production be profitable enough to induce the farmer to change his previous cropping pattern? All indications so far are positive. Take green gram for instance. Under irrigation we can expect an output of 800-1000 lb. of seed per acre. At a selling price of 3 rupees a pound this should bring in an income of Rs. 2,400 to Rs. 3,000 rupees.

The cost of production of such a crop, taking into account all extra inputs such as fertilizers, weedicides and insecticides, should not exceed Rs. 1,000 This leaves a clear profit of Rs. 1,400 to Rs. 2,000, which is just as good or better than the profit margin from rice.