

A METHOD TO PREVENT IRON TOXICITY
IN PADDY FIELDS.

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Introduction:

Symptoms of iron toxicity can be observed in rice plants growing in paddy fields at the bottom of hills in wet zone areas. Depending on its severity and several other factors, rice yield can be reduced drastically. In the Walpita Segment of Gampaha district, iron toxicity can be observed in an extent of about 300 hectares.

The extent of damage caused by iron toxicity depends on the period and amount of rainfall received during the season, the amount of water that seeps from the adjoining highland and the rice variety grown in the field.

An effort was made to drain away the excess water to reduce iron toxicity. Encouraging results were obtained during the two seasons, the trial was done.

Drainage of excess water:

The following steps were adopted.

1. To prevent seepage of water from the adjoining highland drains were constructed close to the outer most bund as shown in diagram I. When it was difficult to construct such drains, drains were constructed around the bunds within the liyadda, to enable excess water to slowly flow out of the liyadda.
2. To improve drainage within the liyadda parallel drains were constructed to have ridges 2 meters broad. This can be done very conveniently with the hand leveller at the time of final levelling. These drains help both drainage and also to enable the soil to dry up when even required. Such an efficient drainage system helps to reduce the amount of water soluble iron (ferrous iron) to the non soluble form (ferric iron).

3. Organic matter is known to increase solubility of iron. Therefore addition of organic matter to the soil during land preparation was reduced to a minimum.
4. Extra potassium was applied to the growing rice crop. In our experimental plots, extra potassium was applied before planting and then again at 4 and 8 weeks after planting rice. The total amount of potassium applied to the plots were 103 kg/ha.
5. Where irrigation water was readily available the soil was allowed to remain dry for about a month.

The rice varieties grown in the experimental plots were the most popular rice varieties grown in the district. They were : BG 400-1, BG 379-2, BG 573, BG 94-1, and BG 34-8.

6. The drainage channels within the liyaddes had to be de-silted to enable them to remain effective through out the season. This was achieved by using a locally fabricated tool. (More information about this appears on Page 18).

De-silting had to be done monthly.

Observations:

1. Observations were made and recorded on
 - growth of rice plants.
 - tillering
 - colour of rice leaves and roots
 - drainage conditions during the season.
2. In the experimental plots growth of rice plants was good. Tillering was normal. Except for the nitrogen deficiency symptoms that occurred sometimes leaf colour was normal. Rice roots were lighter in colour (light brown).

In the control plots, although rice plants appeared poor, tillering was observed. Leaf colour became yellowish brown. Varietal differences influenced the degree of leaf discoloration. Root growth and development was poor. Root colour was dark reddish brown.

3. Yields obtained:

Season	Rice variety.	Yield obtained kg/ha		Increased Yield
		Experimental Plot.	Control Plot.	
1985 Yala	BG 400-1	4150	2880	1270
	BG 379-2	3530	2370	1160
	BG 94-1	3370	2270	1100
	BG 34-8	3200	2350	850
85/86* Yala	BG 400-1	3350	2530	820
	BG 573	3520	2660	860
	BG 94-1	3200	2210	990

- * Unfavourable weather conditions during the flowering stage of rice caused reduced yields in both experimental and control plots.

Conclusions:

The work reported in this Paper was done in farmers fields. These farmers are convinced about the good results obtained.

It is likely that drainage of excess water from the rice fields affected by iron toxicity can increase rice yields. Perhaps this may enable the farmers to increase their profits as a reward for reducing the iron toxicity damage to their rice crops.

Children and world development

The physical and mental development of children is intimately related to the social and economic development of nations. Today's children must not be made to bear the burden of difficult economic times. Broadly applicable and low-cost methods of enabling parents to improve child health are now available. With present knowledge, and with international support, it is therefore possible to achieve, in the next few years, one of the greatest goals which mankind has ever set for itself - basic protection for the lives and normal development of all its children.