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RESEARCH NEWS

MANAGEMENT OF YELLOWING IN RICE (*Oryza sativa*) GROWN IN COARSE TEXTURED SOILS

J.P. SUMANARATNE, I.K. ATAPATTU, M.R.D.L. KULATUNGA, H.M.C. HITINAYAKE, K.K.P. RATHNAYAKA, W.A.D.S.ABEYSEKARA and S.H.S.A. DE SILVA

Regional Agricultural Research and Development Center, Aralaganwila, Sri Lanka

Yellowing of rice (*Oryza sativa*) crop in particular at tillering and panicle initiation stages is more often raised as a question in different for such as Research-Extension Dialogue, Provincial Technical Working Group (PTWG) meetings, Crop Clinics and Field Days. Change in the color of whole plant or plant parts and the degree of discoloration depends on intensity or composition of different photosynthetic pigments. Although there are general explanations available over the situation, the magnitude of the problem is considerable. Therefore, the Regional Agricultural Research and Development Center at Aralaganwila, Sri Lanka launched a series of investigations on the issue starting from *maha* season 2008/2009. Special attention was given on the fertilizer application as the characteristics of sampled plants and soils of the affected fields had evidence of reduced fertilization. The treatments imposed were (1) Urea 313 kg/ha, Triple Super Phosphate - TSP 113 kg.ha, Muriate of Potash - MOP 113 kg/ha, rice straw 5 t/ha, cattle manure 5 t/ha, raw leaves of gliricedia 2.5 t/ha and charred paddy husks 0.625 t/ha as the Department of Agriculture (DOA) recommendation, (2) Urea 313 kg/ha, TSP 113 kg/ha and MOP 113 kg/ha, (3) rice straw 5 t/ha, cattle manure 5 t/ha, raw leaves of gliricedia 2.5 t/ha and charred paddy husks 0.625 t/ha, (4) Urea 235 kg/ha, TSP 85 kg/ha, MOP 85 kg/ha, rice straw 5 t/ha, cattle manure 5 t/ha, raw leaves of gliricedia 2.5 t/ha and charred paddy husks 0.625 t/ha, (5) Urea 235 kg/ha, TSP 85 kg/ha, MOP 85 kg/ha, (6) Urea 235 kg/ha, TSP 85 kg/ha, MOP 85 kg/ha and compost 10 t/ha, (7) DOA recommended chemical and organic basal fertilizers with MOP as top dressing, and Urea as top dressings based on leaf color chart, and (8) a control without fertilizer appliocation. The experiment was conducted with 3 replicates in plots at a size of 6 m x 3 m, using Bg 352 as the rice variety during m*aha* season 2008/2009, *yala* season 2009 and m*aha* season 2009/2010. The yellowing of crop particularly at tillering and panicle initiation stages and the green color of flag leaf at physiological maturity were the parameters measured.

Yellowing was not observed in treatments 1, 4, 6 and 7. The treatment 2, showed a considerable suppression of yellowing and suggests that proper application even with recommended inorganic fertilizer has positive results on managing yellowing in rice crop. The results hinted of the inadequacy of recommended potassium level by symptoms developed in the crop similar to potassium deficiency. This was further supported by soil analytical data on

available potassium content of 21 ppm (lower than the critical level < 70 ppm). Two to three days after an application of nitrogen fertilizer, the leaves turned back to green. This phenomenon was proven by the observations made in treatment 7, which included application of Urea as top dressings based on the readings of the leaf color chart.

The results indicate that addition of major and minor nutrient or improvement of chemical properties of soil by supplementing with organic fertilizer may have negatively influenced on the development of yellowing. However, this could be ruled out from the results of treatment 3. However, improvement of physical properties by organic fertilizer supplements may contribute significantly in retention of nitrogen and potassium for masking of yellowing. In addition, observations showed differences between *yala* and *maha* seasons. The relative contents of photosynthetic pigments of chlorophyll *b*, carrotenoids and xanthophylls accumulated preferentially over chlorophyll *a* under the situation of increased solar radiation as a measure of protecting young cells from increased temperature owing to cell respiration. The differences in climatic conditions between the two cropping seasons were phenomenal and could have led to different rates of plant growth and chlorophyll production during different growth stages of the crop. Yield data associated with different treatments showed a positive correlation with the management of yellowing symptoms.

The results revealed that the changes in the time of fertilizer application and type of fertilizer influences yellowing in rice.