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WEATHER AND TEA YIELDS

By B.C. Cheserek

Weather during the period January to June, 2012 was varied and different from the long-term pattern (see summary in Table 3). Estimated potential soil water deficit of 420.9mm particularly in the months of January to March was recorded. The gaps in Table 3 were due to unavailability of grass minimum temperature data during the period. The period was generally drier (825mm) as compared to the long-term average of monthly cumulative rainfall (1132mm). The month of January recorded no rainfall. Cumulative soil water deficit for the period was 420.9mm; such number of deficit is detrimental to crop production. Additionally, a severe freak frost affected most tea growing areas during the period causing up to 30% crop loss for more than three months. Tea yields therefore, decreased in most growing areas with a mean negative variance of 11.4% compared to the same period last year (Table 1). All the districts east of Rift decreased their production except Nyeri and Kirinyaga. Infact, Kirinyaga district had the highest positive variance (8.1%), while Maragwa had the highest negative variance (-19.8%) during the year. Overall, Kericho district recorded the highest negative variance of -27.4%, while Trans-Nzoia district had the highest positive variance of 10.3%. Twenty-six hail incidences resulting in 485,114kg green leaf loss was reported from west of Rift. Similar incidences reported the previous year although, 167,310kg green leaf was lost in year 2011. A summary of area hit and accruing hail damage losses are presented in Table 2. Hail incidences were highest in April and June particularly in Nandi and Sotik areas. Sotik region recorded the highest number of hail incidences during the period.
TRFK SET TO RELEASE A NEW CLONE TRFK 371/8 FOR COMMERCIAL USE

By S.M. Kamunya, R.C. Muoki, T. Maritim and F.N. Wachira

ABSTRACT

The Tea Research Foundation of Kenya (TRFK) is set to release a new tea clone. The clone, TRFK 371/8 has been undergoing evaluation for the last 18 years in clonal field and adaptability trials alone since selection from progeny testing by the Tea Improving Programme. The clone’s performance in all evaluations across sites, seasons, years and harvesting techniques has consistently been above-average for all desirable and largely economic traits like yield, black tea quality parameters and sensory evaluations, total polyphenols, tolerance to abiotic and biotic stresses. Comparison of hand and machine harvesting technologies revealed clone TRFK 371/8 to be most superior both in yields and tea quality under the two plucking regimes. As the clone has moderate levels of catechins and polyphenols, as well as a slow fermenter it can suitably be exploited for processing of green tea as an additional product for commercial use. Results from various clonal and adaptability trials show that the clone is adaptable to a wide range of tea growing environments including root knot nematode hot spots.
PERFORMANCE AND GENETIC STABILITY FOR YIELD AND QUALITY OF IMPROVED TEA CLONES IN KENYA AND TANZANIA

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ABSTRACT

Tea is grown in areas which differ widely in elevation, climatic and edaphic factors. These differences have profound effect on growth, productivity and quality of tea. A collaborative study between the Tea Research Foundation of Kenya (TRFK) and Tea Research Institute of Tanzania (TRIT) was initiated in 2005 to evaluate the performance and genetic stability of thirty improved tea cultivars across eight tea growing sites in the two sister states. Yield data was collected between 2007 and 2009. Tea quality data entailing extraction and quantification of total polyphenols was generated for 45 clones being evaluated in three Kenyan sites only. Significant differences (P<0.0001) between clones, sites and years and their interactions were revealed. Clone TRFK 371/8 was the best clone in Timbilil and Kangaita, while TRFK 301/5 was best in Ngwazi, Ilenge-R and MTRS. Clone TRFK 31/8 was the best in Sotik. Considering yield means across all sites, clone TRFK 371/8 was, overall, the most outstanding and stable across sites and years. Yield variations attributable to sites showed that Ngwazi, Ilenge-R and Sotik were the most suitable tea growing sites in that order, while Nandi appeared to be the poorest. The %TP was also significantly different (P < 0.0001) among clones, sites and their interactions, implying genes, environment and their interactions have considerable impact on tea quality. As clones TRFK 301/4, TRFK 301/5, TRFK 301/6, TRFK 303/178, TRFK 303/259, TRFK 371/3, TRFK 371/8 had above-average genetic stability for yield, they are suited to good tea growing sites, while those clones with average to below average stability could be exploited in moderate to marginal sites. Clones TRFK 303/259, TRFK 371/3 and TRFK 371/8 had above-average genetic stability for yield and %TP meaning that these clones could be cultivated widely in high yielding environments without compromising yield and quality of black tea.
EFFECT OF VARYING RATIOS OF ENRICHED MANURES ON NUTRIENT UPTAKE, SOIL CHEMICAL PROPERTIES, YIELDS AND QUALITY OF CLONAL TEA

By V.M. Kekana, D.M. Kamau, I.M. Tabu, K.W. Nyabundi and J.K. Wanyoko

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ABSTRACT

Inorganic fertilizer NPK(S) 25:5:5 is generally recommended for optimum yield and quality of tea (Camellia sinensis). Its non-judicious use however poses a threat to sustainability of tea production. Integrated soil fertility management (ISFM) which involves the combined use of organic and inorganic fertilizer is currently being recommended for improved crop yield and soil health. A trial was conducted to determine the effect of enriching cattle manures with different ratios of inorganic fertilizers at varying rates on the nutrient content of the mature leaf, soil chemical properties yield and quality of clonal tea in the east of Rift Valley, Kenya. Enriching inorganic fertilizer up to a rate of 150kg N/ha increased significantly \( p < 0.05 \) the level of P in mature leaf. Higher N and K levels in the mature leaf were also observed when NPKS fertilizer was applied at higher rates. Increasing fertilizer rate up to 150kg N/ha resulted in higher soil pH and K concentration where organic manure and enriched manures were applied while mineral NPKS treatments resulted in higher P content throughout the soil depths. Tea quality parameters, Theaflavins (TF) and Thearubigins (TR) decreased with increase in fertilizer rate regardless of the type and lower levels were observed with increasing amount of NPKS fertilizer. The Caffeine content increased with increase in fertilizer rate especially with NPKS. Enriching organic manures with inorganic fertilizers increased yield significantly. The study demonstrates a beneficial effect of enriched manures in tea production.

Keywords: enriched cattle manure, NPKS, Camellia sinensis, soil nutrient, nutrient uptake
THE INFLUENCE OF FERTILIZER TYPE AND APPLICATION RATES IN TEA CULTIVATION ON NITROGEN AND POTASSIUM DYNAMICS

By Kibet Sitienei, P. G. Home¹, D. M. Kamau, J. K. Wanyoko

¹ Biomechanical and Environmental Engineering Department of Jomo Kenyatta University of Agriculture and Technology, Nairobi, Kenya

ABSTRACT

Most important cultural practices for tea production like single effects of nitrogen (N) and potassium (K) fertilization on yield are well documented but their dynamics are poorly understood. A comprehensive field investigation was conducted in strongly acidic soils tea plots at TRFK, Kangaita station in Kerugoya planted with clone TRFK 11-4 in a 3x3, N x K factorial RCB design to assess the dynamics of nitrogen and potassium in tea cultivation. Treatments were nitrogen (0, 100 and 200 Kg N. ha⁻¹ yr⁻¹) as urea and potassium (0, 40 and 80 Kg K₂O ha⁻¹ yr⁻¹) as Muriate of potash (MoP) replicated thrice. A uniform single dose of phosphorus (40 Kg P₂O₅ ha⁻¹ yr⁻¹) was applied to meet the tea NPK requirements. Tea yield, plant biomass and plant nutrient concentrations were measured for calculation of plant nutrient uptake. Nutrients accumulated in the plants and removed from harvest were considered as nutrient loss, while fertilizer was considered as nutrient inputs gain to soil. In the interaction, there was no significance difference between N-K treatments and crop N removal except mature and maintenance leaves, but there was a positive linear relationship between N applied and the yield of made tea and negative linear relationship between K applied and yield of made tea. Fertilizer inputs generally surpassed the crop nutrient loss from harvesting clone TRFK 11-4 in the region. This implies that for the clone N and K nutrient requirements were less than 100 Kg N. ha⁻¹ yr⁻¹ and 40 Kg K₂O ha⁻¹ yr⁻¹ and the same could be recommended.
EFFECTS OF METHODS OF BRINGING TEA INTO BEARING ON CLONAL TEA YIELDS AND GROWTH: PRELIMINARY FINDINGS

By K. W. Nyabundi and J. K. Bore

ABSTRACT

“Bringing tea into bearing” is any operation designed to form a permanent branch system, from the time the plants are in the nursery to the time they are tipped-in to form a plucking table in the field. Trials were set up at the Tea Research Foundation of Kenya (TRFK) to assess effects of methods of bringing tea into bearing on yield and growth of four different clones at two sites namely; Kirinyaga and Bomet in the East and West of Rift Valley, respectively. Results in the third year indicated that free growth in Bomet gave significantly ($P \leq 0.05$) the lowest yields while nipping gave significantly the highest yields in Kirinyaga. Yield response to treatment was clone and site dependent. The treatments and site did not significantly ($P > 0.05$) affect rate of canopy development. Rate of canopy expansion however, significantly ($P < 0.05$) differed between clones. Analysis of dry matter showed variations in partitioning between clones and treatments. The free growth method was not beneficial to root development as anticipated.
ABSTRACT

Although small holder tea farms are considered younger, management practices may render them moribund much earlier than normal as compared to well managed estates’ tea. Herein we review the effect of age on tea productivity and the possible remedial measures. Tea stands aged over 50 years and having more than 25 per cent vacancies are usually moribund and therefore require drastic action to bring them back to full production. Moribundcy can be caused by a variety of factors. However, fields can be rehabilitated to bring them back to full production. Tea yields reach a peak in 21-30 years after which yields declined. Proper rehabilitation of the uprooted soil is a pre-condition for the success of any replanted operation. In Kenya, uprooting and replanting of tea in the estates has been ongoing on the recent past. However, information on the procedure and costs involved are lacking, though the costs per hectare are estimated to be between KShs 582,641 and KShs 903,023. Use of heavy equipment is impracticable and unaffordable to majority of the small holder farmers. Uprooting tea by bulldozer causes the highest soil compaction giving mechanical impedance to penetration, heavy destruction of soil structure and significantly reducing water infiltration rate as compared to winching and hand uprooting. The traditional method of replanting tea by the manual uprooting of old tea bushes is also expensive and promotes soil erosion. Variants of a system of replanting tea with minimum cultivation have been described as an alternative.

A DS model demonstrates that farmers’ income can be doubled by replanting, hence exercise vital if productivity in the ageing tea plantations is to be improved.