

Editorial IJTS 7(1&2)

The international Journal of Tea Science suffered “Sudden Death Syndrome” (SDS), early in 2008. Google describes SDS as “an abrupt loss of life believed to be caused byan extremely stressful and unexpected event producing feelings of extreme helplessness ... that force an individual to make changes in life”. As mentioned in the next article "ISTS 200-2008", your editor's long illness was the cause of now identified SDS which delayed the IJTS 6(4) special issue on OCHA 2007 ABSTRACTS, by six months. The search for a worthy successor to this publication and the ISTS Society finally zeroed on to a group of volunteers comprising of the tallest names in tea research and industry. These worthy scientists were Yukihiro Hara, Ryoso Saijo from Japan and Zeno Apostolides from South Africa. Transfer formalities involved in this “Change of Guards” have taken a long time and are still to be completed. In this process, the publication of the next issue of the Journal was inordinately delayed till your still-ailing editor took up work on publication of this issue IJTS 7(1&2) and arrange to handover the journal midterm to the new team for publication of the next issue of volume 7.

This issue IJTS 7(1&2) is an important land mark not only because it is the last issue published by its Founders and a harbinger of a fresh-look Informative Journal with a new team on the helm of affairs. But this publication is also important because it publishes four papers on the problems under foremost attention of tea scientists and tea industry.

Chapter 1 by Joshi & Ganguli. Is a review of information available on the health effects of black tea on humans as impacted by quantity of milk added to black tea. The importance of this subject is evident from the fact that black tea production and consumption in the world is double that of green tea. Green tea researches have gathered a fund of information on the health effects of green tea while the researches on health effects of black tea are fewer. Further, black tea consumers add milk to black tea liquor, unlike the green tea drinkers. Earlier the authorities suggested that addition of milk beyond 2% might affect the health properties of tea. The experience of tea marketers in Indian states of Gujarat and Punjab is that tea is prepared even by boiling tea leaves in pure milk. The question whether such a large quantity of milk will destroy the health giving properties of black tea has assumed a very high significance of the public health groups. Joshi & Ganguly have examined in this chapter all the clinical studies available on the subject. Bulk of the data shows that addition of milk up to 25% in black tea is not deleterious to human health, which is good news for the consumers, marketers and public health authorities. However, a strong case is made out for conducting further clinical controlled studies with human subjects on the desirable quantum of milk, added to black tea without impacting the health effects of black tea.

Chapter 2 by Owuor has summarised the yield response of nitrogen for two decades on clone S15/10, which reached 10,000 kg made tea per hectare -- the highest ever yield recorded. Reports of such long term experiments on a perennial crop like tea are few and far between. They hold very important lessons for the industry which is in for a long innings. The editor is familiar with the long-term fertiliser trial started on tea in Tocklai in India soon after statistical designs were discovered. Another long term fertility trial was laid out in the thirties at St Coombs Srilanka. In arable crops, Marrow plots at University of Illinois in the US hold a mirror to such long-term studies of continuous manuring on the crop and soil. However, when the three aforementioned trials, were started the techniques of statistical design were not well developed. This experiment at TRF Kenya has the advantage of a well planned statistical design and analyses, handled by an accomplished tea scientist.

Chapter 3 by Sharma and Chandramouli discuss the role of rejuvenation pruning in South India. Replanting to replace the aging tea is a costly proposition. Unproductive seedling tea in large tracts

of North and South India and even in Srilanka and Kenya is not replaced after what is considered as The economic life of the tea bushes. Old tea in South India made a remarkable recovery in two decades of 1960s and 1970s by doubling the production through heavy pruning and rejuvenation without switching over to clonal tea or planting with new varieties. The editor recalls his own experience with small growers of Himachal Pradesh during the 1980s. Rejuvenation pruning and improved management of 125 year old dilapidated chinery bushes increased tea productivity on farmers' fields from 4 to 10 times within a period of 6 years. Combined with infilling or consolidation and part replanting under intensive supervision, increased the productivity of abandoned tea 43 times on a 30 acre experimental farm. Chapter 4 by Bhuiyan *et al.* presents data on withering and fermentation aspects of environmentally controlled black tea processing for quality. The study has brought out the variable processing requirements of different tea clones for optimising quality manufacture. Application of the new findings in tea processing technology will have a far reaching impact on the quality of black tea and will revolutionise the tea processing factories at least in North India. Summarised below are the abstracts of the four papers presented in this issue.

Chapter 1: Modulation of Health Effects of Black Tea by Milk, by Joshi and Ganguli: The addition of milk may have significant implications in bioavailability and health effects of tea flavonoids in south Asia where tea infusion is mostly prepared by boiling (as against brewing) tea leaves in presence of milk for time ranging from few to several minutes. In the absence of any significant epidemiology or clinical study from the region, the supporting evidence for public health contribution of tea flavonoids relies on the evidence derived mainly from western countries for black tea and Japan and China for green tea. In this article, we review the relevant literature available on influence of milk on the health effects of tea. The available literature indicates that amount of milk in tea, if kept below 25%, does not significantly affect bioavailability of catechins in blood plasma. Though milk may delay the time taken to raise plasma antioxidant potential, the levels still reach significantly higher level. There is a need, particularly in South Asia, to initiate further studies on human subjects to generate data, which at this time seem insufficient for any evidence based nutritional recommendation on addition of milk to tea especially when the amount of added milk is high.

Chapter 2: Long Term Fertilizer use on High Yielding Clone S15/10 by Owuor *et al.*: High production of young tender shoots of tea leads to soil nutrients depletion through harvested crop and leaching. The production can be sustained by replenishing the lost nutrients through regular addition of fertilizers and/or organic manures. In Kenya, NPKS 25.5.5.5 or NPK 20.10.10 are the recommended fertilizers for tea. Clone S15/10 is a high yielding tea and has given yields of over 10,000 kg made tea (mt) per hectare per year in a year with good cropping weather. Long term (18 years) experimentation on the amounts of fertilizers needed to sustain the yields demonstrated that application of nitrogenous fertilizer resulted in significant yield responses. The application of high rates of fertilizer produced quadratic yield response with a maximum at about 300 kg N ha⁻¹ year⁻¹. Quantities between 200 and 250 kg N ha⁻¹ year⁻¹ were considered optimal. There were no significant differences in the yields responses due to use of NPKS 25:5:5:5 and NPK 20:10:10. The NPK formulation to use on tea in Kenya should therefore be decided based on other factors like availability, cost, ease of handling, etc. Despite the control plot not receiving fertilizer for the 18 years of experimentation, it continued to produce yields higher than most seedling tea receiving adequate nutrition. In a subsequent trial to assess splitting the annual fertilizer application could improve yields, applying fertilizer at half rate annual rate every six months or one third rate at four months intervals did not cause any significant changes in yields at all rates tested for six years. The splitting annual fertilizer applications may therefore be practised for other reasons like uniform distribution of the fertilizer in the tea plantations, cash flow and storage considerations, ease of handling, etc. In a trial to establish the effect of plucking rounds on yields, there were significantly higher yields when

harvesting interval was 7 days compared to 14 or 21 days intervals in the eight out of ten years of experimentation. In most years the 14 day plucking interval produced the lowest yields. These results demonstrate that shorter plucking intervals are beneficial to high tea production in the Kenya highlands

Chapter 3: Rejuvenation Pruning for Rehabilitation of Tea in South India, by Sharma & Chandramouli: The technology of “Rejuvenation pruning” of debilitated tea was conceptualized and developed in south India during the late 1960s and early 1970s. Rejuvenation pruning stimulates the development and growth of a new, strong and healthy primary frame, supporting good secondary branch systems and higher productivity for a prolonged period. Wide acceptability and success of this concept obviated the need for uprooting and replanting of old tea in south India, to a great extent. Rejuvenation pruning facilitates infilling the vacant patches that arose due to the death of old bushes owing to various causes over the decades; it also makes possible putting out a new plant between the old bushes existing at the original wide spacing, leading to a doubling of the population.

The benefit by way of increased yield due to rejuvenation ensues from the third year from pruning and that due to infilling and interplanting from the fourth year from planting. The break-even of the expenses and crop loss could be achieved by about six years.

Chapter 4: Chemical withering Parameters on Quality of Tea. By Bhuiyan *et al.* A series of withering and fermentation experiments in black tea processing were conducted in Environmentally Controlled Manufacturing (ECM) system. Three different hygrometric conditions (i.e 2, 1 and 0° WBD) during withering and five different fermenting times during fermentation were maintained to assess the variation in quality components of black tea. Fresh tea leaves of clones TV1 and TV26 were collected were analysed for five major catechins i.e. EGC, +C, EC, EGCG and ECG in fresh (F) as well as in withered (W) leaf and theaflavins (TF), thearubigin (TR) and its fractions, total color (TC), brightness (B) and volatile flavor components (VFC) in black tea. In this set of experiment total withering time was maintained 12hrs, where the moisture loss in the initial hours was restricted by manipulating the wet bulb depression (WBD). Under the least WBD (0°) the chemical change during chemical withering was most favorable for quality. Fermentation time of 50min was better for brighter tea in TV1 whereas for TV26 it was 70min. Flavour index (F.I) in clone TV1 was higher with 5hours wither with 0° wet bulb depression while for clone TV26 flavor index was higher when WBD was maintained at 2° WBD.

The Abstract section was thoroughly scrutinised to eliminate duplicates of those published earlier. We hope you will make addition to your knowledge in the areas of your interest. Following this editorial is Swan song description of the founder team of the IJTS and ISTS bidding adieu to its readers with whom it had the pleasure of working for the last eight years.

We are sad at this parting of company but glad that the Journal will be in good hands of those who can tap far more vast treasures of information from tea researches published in Chinese and Japanese languages that is normally denied to the readers of the English Language. We look forward to this journal becoming an accredited journal in not too distant a future.

HAPPY READING.

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