Annex F.3

Mycological Training Workshop, April 2nd to 12th 2002 Coffee Research Foundation, Kenya

1.1 Programme

Tuesday 2nd April	Arrival, welcome to CRF and overview of the Kenyan coffee sector (Dr. Gathaara, acting director of CRF); orientation
Wednesday 3rd April	Depart for Kirinyaga by 10:00; rendezvous with liaison officer in Kerugoya and start field work
Thursday 4th April	Continue field work, visit co-operative factory
Friday 5th April	Conclude field work by 16:00 and return to CRF
Saturday 6th April	06:30 Visit Nairobi game park 17:00 Discussion on field methodology,
Sunday 7th April	Free
Monday 8th April	10:00 Mycological analysis of samples 14:30 Completion of analysis; rationale of the analysis and first phase sampling
Tuesday 9th April	10:00 Enumeration of demonstration samples, recording data; sub-culturing; record keeping 14:30 Library session 16:00 Interpretation of viable counting; reporting results; moisture content, measurement, influence on mould growth; major field problems in Kenya (Mr. Gichuru)
Wednesday 10th April	09:00 Visits to large estate and its factory 14:00 Visit to coffee mill, KPCU Nairobi; free time in Nairobi
Thursday 11th April	09:00 Examination of known cultures, use of characterization questionnaire 14:30 Continue examination of cultures; HAACP and mycological experimentation; GPS data handling; use of MS Excel 19:30 Workshop dinner
Friday 12th April	09:00 Second phase sampling; question and answer / discussion period – finish by lunch

1.2 Outline of lectures

Tuesday 2nd April **Orientation**	▪ Conduct and schedule of the workshop ▪ Salient points of the project - Role of mycological activities in overall project - OTA vs. fungal mediated quality loss - Importance of uniformity of methodology - Long-term objectives of improving research capacity in mycology ▪ Objectives of the workshop - Multi-party discussion of approach and methodology - Exchange experiences and information - Foster collaboration - Confidence building
Saturday 6th April **Field activities: de-briefing and sampling appropriate to other production systems**	▪ Discussion of conduct of farm visits ▪ Sampling appropriate to other stages of the coffee calendar / production systems - Swabs / vegetative tissue - Storage of coffee; A_w, m.c., test weight - Handling samples for moisture status; relation to intended m.c. - Drying yard size ▪ Questions and sampling of small middlemen - Who does he buy and sell from and to? - How long is coffee is held? - Criteria employed to negotiate buying price - Any redrying? Any refusals? Come across mouldy smelling coffee? If so, its fate… - Traceability and interpretation of analytical results

Monday 8th April **Explanation of project methodology and rationale of first phase sampling**	▪ Dilution fluids - Arguments for the use of peptone water and alternatives ▪ Sterilization methodology - Stability of hypochlorite during storage and in light - Reaction with organic matter - Efficacy related to wetting ▪ 3-part analysis - Significance of differences between tissues and changes during drying - Concepts of adaptation to niches mutualism and competition - Application in studies to determine bean infection route ▪ Air sampling - Proportional / absolute counts - Qualitative / quantitative methods and precision ▪ Media performance - Selective media vs elective media vs 'non-selective' media for enumeration - Properties and uses of DG18 and DC03 - Rationale and practice of the use of diagnostic media
Rationale of, and extension of, first phase sampling	▪ The idea of non-random sampling at random sites - Phase two sampling site location - Development of familiarity with coffee associated fungal communities ▪ Processing experiments - Initial conditions – process – outcome form processing experiments - Time-course format experiments - Evaluation of processing parameters with respect to fungal development ▪ Directed sampling - Expectation, observation and one-off samples - Examples: fallen cherries, processing procedure failures, insects, impact of plant disease, tree-dried cherry, processing plant cleaning

Tuesday 9th April **Enumeration interpretation and reporting of viable counts**	▪ Methods of enumeration of moulds - Viable counts: interpretation of colony forming units - Chemical / immunological methods ▪ Sensitivity of enumeration results to methods employed ▪ Measurement concepts - Biomass versus sporulation - Differentiation as distinct from - Growth versus infection ▪ Interpreting viable counts in context of project objectives - Dilution plate and air sampling methods - Direct plating methods - Interpretation of changes in processing experimants ▪ Reporting conventions for the project and their rationale - Bean infection rates versus fungal community characterization - Expressions of speciation and species dominance - Practical notation for linking isolates to samples and procedures - Principles of use of isolates to characterize communities
Water in coffee, physical principles, measurement and relation to mould growth	▪ Definitions: A_w, equilibrium water activity and moisture content ▪ Strengths and weaknesses of measurement technologies - Equilibration period errors relating to sample type (disequilibrium) - Temperature of measurement errors ▪ Distribution of water in the cherry and bean ▪ Characterization of cherry drying - Impact of differential hygroscopicity on drying rates - Impact of skin disruption and bean shrinkage on drying rates ▪ Mould activity and A_w - Growth, mycotoxin production and A_w - Xerophilicity and adaptation in communities ▪ Development of farm-practical drying monitoring - Possible role of drying monitoring in CCP process parameters - Progress toward a gravimetric m.c. method ▪ Specific queries for answering required to verify a measurement method
Major problems of the Kenyan coffee sector	▪ Discission led by E.K. Gichuru, CRF, Kenya

Thursday 11th April **Orientation: experimental design and the application of mycological data in HACCP development**	▪ Relation of processing characterization and experimental design - Interpreting physical measurements in respect of mould physiology - Use of local processing variations in developing process control proposals - Co-ordination and interrelation of national and international activities ▪ Verification of process control proposals ▪ Socio-economic data and practicality
Handling GPS data	▪ Latitude and longitude ▪ Converting degrees and minutes to Km and metres ▪ Positive and negative values relating to compass direction

1.3 Participant list

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