

TEA RESEARCH INSTITUTE



ANNUAL TECHNICAL REPORT FOR THE YEAR 2015

INSTITUTE HEAD OFFICE AND CENTRAL RESEARCH UNIT

Timbilil Estate, P.O. Box 820 - 20200, Kericho, Kenya

Telephone: Kericho +254-052-20598 & 20599

Fax: +254-052-20575

E-mail: director.tri@kalro.org, info@tearesearch.or.ke

Website: www.kalro.org, www.tearesearch.or.ke

CENTRE

Kangaita Centre, P.O. Box 987 - 10300, Kerugoya, Kenya.

E-mail: trfkkgaita@tearesearch.or.ke; trfkkgaita@gmail.com

©Tea Research Institute

COVER PAGE PHOTO DESCRIPTION

Effects of shade trees in ameliorating frost damage

TABLE OF CONTENTS

KALRO -TEA RESEARCH INSTITUTE.....	vi
MANAGEMENT STAFF.....	vii
DIRECTORATE AND ADMINISTRATION:.....	i
INSTITUTES DIRECTORS REPORT.....	i
<i>Tea Breeding and Genetic Improvement Investigations</i>	i
<i>Environmental Investigations</i>	iii
STAFF TRAINING / WORKSHOPS.....	v
LIST OF PUBLICATIONS.....	vi
VISITORS TO TEA RESEARCH INSTITUTE DURING THE YEAR 2015.....	viii
CROP IMPROVEMENT AND MANAGEMENT PROGRAMME.....	11
TEA BREEDING AND GENETIC IMPROVEMENT (TBGI) DIVISION.....	11
TEA IMPROVEMENT INVESTIGATIONS.....	11
<i>Breeding experiments</i>	12
TRI/CIM/TBGI/BREED/1d: <i>Breeding for tolerance to environmental stress</i>	14
TRI/CIM/TBGI/BREED/1e: <i>Breeding for green tea varieties</i>	14
<i>Clonal Field Trials</i>	18
<i>Clonal Adaptability Trials (Participatory Clonal Field Trials)</i>	30
GENETIC INVESTIGATIONS.....	39
TRI/CIM/TBGI/GENET 3b: <i>Genetic relationships and breeding patterns among African teas</i>	40
<i>Genetic relationships and germplasm exchange of tea accessions within Africa</i>	40
<i>Biochemical diversity of Kenyan tea cultivars</i>	55
<i>Anthocyanins</i>	58
TRI/CIM/TBGI/GENET 7: <i>Diallel crosses in tea</i>	60
TRI/CIM/TBGI/GENET 7f/2000.....	60
TRI/CIM/TBGI/GENET 3d (i): <i>Influence of environmental cues on the regulation of anthocyanin content in tea</i>	64
INTEGRATED PESTS AND DISEASE MANAGEMENT.....	68
ENTOMOLOGICAL INVESTIGATIONS.....	69
<i>Screening of clones for susceptibility/resistance to mite infestation</i>	69
PATHOLOGICAL INVESTIGATIONS.....	77
TRI/CIM/IPDM/PATH/18(e): <i>Integrated management of Armillaria root rot at Gicheha Farm Ltd, Gakoe Tea Estate</i>	77
<i>Effect of Shubhodaya Biofertilizer on Mycorrhizal Hyphae in the nursery</i>	83
SUSTAINABLE ECOSYSTEM MANAGEMENT & CONSERVATION (SEMC) PROGRAMME.....	87
SOIL FERTILITY AND PLANT NUTRITION INVESTIGATIONS.....	87
TRI/SEMC/CHEM 7F: <i>Long-term response of seedling tea to high rates of NPKS fertilizer, Timbilil Estate, Kericho</i>	88
<i>Effects of rates of NPK 25:5:5 fertilizer application on the yields</i>	88
TRI/SEMC/CHEM 36F: <i>Effects of long intervals of nitrogen fertilizer application and prunings mulch on the yields, nutritional status and quality at two sites</i>	89
TRI/SEMC/CHEM 12F: <i>Comparison of response to rates of nitrogen fertilizer by four different clonal teas, Timbilil Estate, Kericho</i>	90
<i>Effects of nitrogen fertilizer rates on the yields of clonal teas</i>	90
TRI/SEMC/CHEM 21F: <i>Effect of plant population and nitrogen fertilizer rates on clone AHP S15/10 tea, Timbilil Estate Kericho</i>	91
<i>Effects of plant population and nitrogen fertilizer rates on yields</i>	91

TRI/SEMC/CHEM 11F: <i>Root studies and nutrient contents of clonal tea plants at Timbilil Estate</i>	93
<i>Effects of the micronutrients and clones on the yields of tea on replanted on uprooted area</i>	94
<i>Effects of the micronutrients combinations on soil pH</i>	95
<i>Effects of the micronutrients combinations on leave trace elements</i>	96
<i>Effects of supplementing NPK 26:5:5 with micronutrients on the yields of clone AHP S15/10</i>	98
TRI/SEMC/CHEM 45F: <i>Effects of soil applied molybdenum on clonal tea yields, Sotik Tea Co. Ltd., Sotik</i>	98
<i>Effects of the fertilizer treatments on tea yields (sorted leaf)</i>	98
HORTICULTURAL STUDIES	116
TRI/SEMC/CED 13: <i>Effect of plucking frequency and nitrogen rates on the components of yield of clones EP/TN 14-3 and TRFK 56/89</i>	116
TRI/SEMC/CED 17: <i>Effects of shade trees and shelter on tea yields, Sotik Tea Company, Sotik</i>	117
TRI/SEMC/CED 18: <i>Effects of shade tree species on yield and yield attributes of tea in Timbilil Estate.</i>	118
PHYSIOLOGICAL INVESTIGATIONS	119
TRI/SEMC//KENSALT/1 2012: <i>Effects of irrigation and plant population on tea establishment, growth and yield in a low altitude area of Kenya</i>	126
ENVIRONMENTAL INVESTIGATIONS	130
TRI/SEMC/CED 24: <i>Development, implementation and monitoring of the TRI Environmental policy to ensure conformity to EMCA, 1999</i>	130
TRI/SEMC/CED 52/WEATHER/11: <i>Assessment of hail and frost damage on tea: Effects of hail damage on tea physiology</i>	131
APPENDICES.....	171
TEA PROCESSING AND VALUE ADDITION (TPVA) PROGRAMME	143
PRODUCT DEVELOPMENT AND VALUE ADDITION INVESTIGATIONS.....	143
TRI/TPVA/FS1: <i>Tea alcoholic beverage</i>	143
TRI/TPVA/FS/9: <i>Testing tea fortified yoghurts and alcoholic beverages on animal models</i>	149
ECONOMICS, FIELD ADVISORY AND CORPORATE COMMUNICATIONS (EFACC) PROGRAMME.....	156
FIELD ADVISORY	156
TRI/EFACC/FA/1: <i>Visits and visitors</i>	157
TRI/EFACC/FA/2: <i>Field/Open days/Shows</i>	160
<i>FFS Methodology Follow-up</i>	161
TRI/EFACC/FA/4: <i>Demonstrations</i>	163
SOCIO-ECONOMICS	164
TRI/EFACC/SOCO 01: <i>Tea Market Intelligence Exit Survey Report 2015</i>	164