ANNUAL REPORT

OF THE
COCOA RESEARCH INSTITUTE OF NIGERIA, IBADAN

2001

TABLE OF CONTENTS **PAGE**

PRINCIPAL ADMINISTRATION AND RESEARCH STAFF LIST
AS AT DECEMBER 2001

ADMINISTRATION

1.	Director/Chief Executive	-	Ayoola B. Fasina	-	B.Sc. Ph.D
2.	Asst. Director (CIM)	-	E.B. Esan	-	B.Sc. Ph.D
3.	Asst. Director (CPS)	-	O.L. Idowu	-	B.Sc.Ph.D, OIC
4.	Ag. Admin. Secretary	-	J.O. Babafemi	-	B.Sc. MPA, MNIM

RESEARCH

Plant Pathologists

1.	T.O. Adejumo	-	B.Sc. M.Sc. Ph.D
2.	S.O. Agbeniyi	-	B.Sc. M.Sc. M. Phil
3.	A.R. Adedeji	-	B.Sc. M.Sc.
4.	A.H. Otunoye	-	B.Sc.

Plant Breeders

1.	E.B. Esan	-	B.Sc. Ph.D
2.	K. Badaru	-	B.Sc. M. Phil
3.	S.S. Omolaja	-	B.Sc. M.Sc. M. Phil
4.	P.O. Adebola	-	B.Sc. M.Sc. M. Phil
5.	O.M. Aliyu	-	B.Sc. M.Sc.
6.	P.O.Aikpokpodion	-	B.Sc. M.Sc.
7.	C.J. Bright-Agidotan (Mrs.)	-	B.Sc. M.Sc.

Agronomists

1.	A.O. Famaye	-	B.Sc. M.Sc.
2.	E.A. Adeyemi (Mrs.)	-	B.Sc. M.Sc.
3.	E.A. Olaiya	-	B.Sc. M.Sc.
4.	L.A. Hammed	-	B.Sc. M.Sc
5.	A.O. Oloyede	-	B.Sc. M.Sc

Entomologists

1.	O.L. Idowu	-	B.Sc. Ph.D
2.	F.A. Okelana (Mrs.)	-	B.Sc. M. Phil
3.	T.C.N. Ndubuaku	-	OND B.Sc. M.Sc.
4.	K.T.M. Ojelade	-	B.Sc. M.Sc
5.	O.F. Adewola (Mrs.)	-	B.Sc. M.Sc
6.	E.U. Asogwa	-	B.Sc. M.Sc

Soils & Plant Nutrition Scientists

1.	E.A. Ayodele	-	B.Sc. M.Sc
2.	O.S. Ibiremo	-	B.Sc. M.Sc
3.	R.R. Ipinmoroti	-	B.Sc. M.Sc
4.	M.A. Daniel	-	B.Sc.

Crop Processing & Utilization Scientists

1.	O. Olubamiwa	-	B.Sc. M.Sc Ph.D
2.	T.O. Akinwale	-	B.Sc. M.Sc
3.	C.O. Jayeola (Mrs.)	-	B.Sc. M.Sc
4.	R.A. Hamzat	-	B.Sc. M.Sc
5.	L.E. Yahaya	-	B.Sc. M.Sc
6.	S.O. Aroyeun	-	B.Sc. M.Sc
7.	S.O. Ogunwolu	-	B.Sc. M.Sc
8.	A.A. Ajao	-	B.Sc. M.Sc

Econs & Statistics Scientists

1.	O.O. Oduwole	-	B.Sc. M.Sc
2.	T.R. Shittu	-	B.Sc. M.Sc
3.	R.A. Sanusi	-	B.Sc. M.Sc

Health Centre

1.	J.O. Coker	-	MBBS (Part-time Medical Officer)
2.	F.J. Oloyede	-	SPN S.C.M.

Officers-In-Charge Of Substations

Adeyemo G.O.	-	Ikom
Akintoye T.B.	-	Owena
R.A. Madehin	-	Mambilla
Adebayo O.	-	Ibeku
Ajani A.	-	Ochaja
J.A.O. Akinboboye	-	Uhonmora

YEAR 2001 FRESH APPOINTMENTS

S/N	NAME	POST	DEPLOYMENT	DATE OF ASSUMPTION OF DUTY
1.	Mr. I. Adewumi	Head Watchman HATISS 01	Security Unit	10/01/2001
2.	Mr. Adejumo, S.A.	Lab. Attendant HATISS 01	Agronomy	14/06/2001
3.	Mr, Augustine Mari	Asst. Agric. Supt. HATISS 05	Mambilla S/S	26/06/2001
4.	Mr. Kunuola, W.P.	Field Attd. Gd. II HATISS 01	Agronomy	13/06/2001
5.	Mr. Asimi, O.T.	Field Attd. Gd. II HATISS 01	Entomology	15/06/2001
6.	Mr. Oguntimehin, L.	Field Attd. Gd. II HATISS 01	P/Pathology	18/06/2001
7.	Mr. Lawal, L.	Field Attd. Gd. II HATISS 01	CPU	18/06/2001
8.	Olaleye, O.O.	Field Attd. Gd. II HATISS 01	Engineering Group	18/06/2001
9.	Olaleye, Oluseye	Field Attd. Gd. II HATISS 01	P/Pathology	18/06/2001
10.	Atanda, T.	Field Attd. Gd. II HATISS 01	GMESS	18/06/2001
11.	Odunewu, S.A.O.	Field Attd. Gd. II HATISS 01	Entomology	19/06/2001
12.	Kareem, S.	Field Attd. Gd. II HATISS 01	Engineering	18/06/2001
13.	Adeleke, O.A.	Field Attd. Gd. II HATISS 01	GMESS	15/06/2001
14.	Okere, M.J.	Field Attd. Gd. II HATISS 01	GMESS	15/06/2001
15.	Ajulo, M.O.	Asst. Craftsman HATISS 02	Engineering	15/05/2001
16.	Babafemi, S.	Asst. Craftsman HATISS 02	Engineering	12/06/2001
17.	Togun, B.O. (Mrs.)	Asst. Craftsman HATISS 02	Engineering	12/06/2001
18.	Ogunmuyiwa, J.M. (Miss)	Asst. Craftsman HATISS 02	Engineering	14/06/2001
19.	Oyeniran, S.	Asst. Craftsman HATISS 02	Engineering	13/06/2001
20.	Sodunke, S.O.	Asst. Craftsman HATISS 02	Engineering	13/06/2001
21.	Adewoyin, A.	Asst. Craftsman HATISS 02	Engineering	13/06/2001
22.	Salami, K.A.	Asst. Craftsman HATISS 02	Engineering	13/06/2001
23.	Yusuf, A.	Asst. Craftsman HATISS 02	Engineering	14/06/2001
24.	Adeogun, M.	Asst. Craftsman HATISS 02	Engineering	15/06/2001
25.	Okanlawon, T. (Mrs.)	Asst. Craftsman HATISS 02	Engineering	15/06/2001
26.	Oladiti, S.	Asst. Craftsman HATISS 02	Engineering	15/06/2001
27.	Oduntan, S.	Asst. Craftsman HATISS 02	Engineering	18/06/2001
28.	Muritala, M.	Asst. Craftsman HATISS 02	Engineering	18/06/2001
29.	Salami, Y.	Asst. Craftsman HATISS 02	Engineering	18/06/2001
30.	Ironua, S.	Asst. Craftsman HATISS 02	Engineering	19/06/2001
31.	Uwaifo, A.I.	Asst. Craftsman HATISS 02	Engineering	19/06/2001
32.	Fayinka, O.S.	Asst. Craftsman HATISS 02	Engineering	19/06/2001
33.	Ibiyemi, A.O.	Asst. Craftsman HATISS 02	Engineering	21/06/2001
34.	Akinbinu, A.	Motor Driver/Mech HATISS 03	Owena S/S	15/01/2001
35.	Grema Mohammed	Motor Driver HATISS 02	Ochaja S/S	16/07/2001
36.	Asuquo John	Motor Driver HATISS 02	Ajassor S/S	27/08/2001
37.	Emeng Eno John	Motor Driver HATISS 02	Ajassor S/S	27/08/2001
38.	Igbmadolor, R.O.	Res. Officer II HATISS 07	Econs & Statistics	06/12/2001
39.	Uwagboe, E.O.	Res. Officer II HATISS 07	P/Pathology	11/12/2001
40.	Mari, A.	Asst. Agric. Supt. HATISS 05	Mambilla S/S	26/06/2001
41.	Imade, C.O.	Asst. Agric. Supt. HATISS 05	Uhonmora S/S	06/12/2001
42.	Mrs. Adejumo, M.	Res. Officer II HATISS 07	Econs & Statistics	18/12/2001
43.	Mrs. Umogbai, E.I.	Higher Exec. Officer HATISS 7	Fin. & Accounts	02/12/2001

2001 PROMOTION

NO.	NAME	PROMOTION FROM THE POST OF	PROMOTED TO THE POST OF	EFFECTIVE DATE
1 .	Mrs. F.A. Okelana	Asst. Chief Res. Officer HATISS 12	Chief Res. Officer HATISS 13	01/10/2000
2.	T.C.N. Ndubuaku	Prin. Res. Officer HATISS 11	Asst. Chief Res. Officer HATISS 12	01/10/2000
3.	O.O. Oduwole	Prin. Res. Officer HATISS 11	Asst. Chief Res. Officer HATISS 12	01/10/2000
4.	A.O. Famaye	Snr. Res. Officer HATISS 09	Prin. Res. Officer HATISS 11	01/10/2000
5.	S.O. Aroyeun	Research Officer Gd. II HATISS 07	Research Officer Gd. I HATISS 08	23/12/1999
6.	S.O. Ogunwolu	Res. Officer Gd. I HATISS 08	Snr. Lab. Tech. HATISS 09	28/09/2000
7.	E.A. Onigbinde	Asst. Chief Lab. Tech. HATISS 12	Chief Lab. Tech. HATISS 13	01/10/2000
8.	F.A. Sobowale	Asst. Chief Lab. Tech. HATISS 12	Chief Lab. Tech HATISS 13	01/10/2000
9.	Mrs. S. Adesiyan	Prin. Supt. I HATISS 11	Asst. Chief Agric Supt. HATISS 12	01/10/2000
10.	A. Ajayi	Prin. Agric Supt. II HATISS 09	Prin. Agric Supt. I HATISS 11	01/10/2000
11.	O. Olutade	"	"	"
12.	A. Ajani	"	"	"
13.	E.A. Odeboju	"	"	"
14.	J.A.O. Akinboboye	"	"	"
15.	O.R. Lawal	"	"	"
16.	R.A. Adeleke	"	"	"
17.	Mrs. C.O. Ogundipe	"	"	"
18.	O. Adebayo	"	"	"
19.	R.F. Biiya (Miss)	Snr. Agric. F/Overs. HATISS 06	Higher Agric. Supt. HATISS 07	01/08/99
20.	B.M. Ogunleye	Agric. Supt. HATISS 06	Higher Agric. Supt HATISS 07	01/01/2000
21.	D.K. Kuforiji	Agric. Supt. HATISS 06	Higher Agric. Supt HATISS 07	01/01/2000
22.	S.O.A. Arowobusoye	Prin. Graphic Arts Offucer II, HATISS 09	Prin. Graphic Arts Officer I, HATISS 11	01/10/2000
23.	S.K. Ale	Snr. Photographer HATISS 08	Prin. Photographer HATISS 09	01/10/2000
24.	J.O. Babafemi	Prin. Admin Officer HATISS 11	Asst. Chief Admin Officer HATISS 12	01/10/2000
25.	S.E. Ebohon	"	"	"
26.	O.S. Adefaka	Prin. Accountant HATISS 11	Asst. Chief Accountant HATISS 12	01/10/2000
27.	J.O. Ogunbayo	Asst. Chief Exec. HATISS 12	Chief Executive Officer HATISS 13	01/10/2000
28.	E.A. Deji	Prin. Exec. Officer II HATISS 09	Prin. Exec. Officer I HATISS 11	01/10/2000
29.	A.S.B. Akanni	"	"	"
30.	K.M. Fabowale	Snr. Exec. Officer	Prin. Exec. Officer II	

		HATISS 08	HATISS 09	01/10/2000
31.	E.O. Kuforiji	Asst. Exec. Officer	Higher Exec. Officer	
		HATISS 05	HATISS 07	29/06/2001
32.	Mrs. J.U. Njoku	Snr. Typist Gd. I	Chief Typist	
		HATISS 07	HATISS 08	01/10/2000
33.	Mrs. K.T. Bamidele	Snr. Typist Gd. II	Snr. Typist Gd. I	
		HATISS 06	HATISS 07	01/10/2000
34.	Mrs. F.J. Oloyede	Asst. Chief Nur. Offier	Chief Nursing Officer	
		HATISS 12	HATISS 13	01/10/2000
35.	Mrs. M.A. Olugbesan	Prin. Nur. Officer	Asst. Chief Nur. Offr.	
		HATISS 11	HATISS 12	01/10/2000
36.	Mrs. G.A. Ogunbode	"	"	"
37.	Mrs. A. M. Idowu	"	"	"
38.	S.A. Busari	Snr. Nur. Officer	Prin. Nur. Officer	
		HATISS 09	HATISS 11	"
39.	Mrs. F.A. Abe	"	"	"
40.	J.B. Adebayo	Asst. Tech Officer	Higher Tech. Officer	
		HATISS 05	HATISS 07	01/08/98
41.	F. Akintorinwa	Foreman, HATISS 05	Snr Foreman HATISS 06	01/10/2000
42.	Y. Aribido	Foreman, HATISS 05	Snr Foreman HATISS 06	01/10/2000
43.	L. Nwagala	"	"	"
44.	C. Nwajei	Asst. Chief Draughtsman	Chief Draughtsman	
		HATISS 05	HATISS 06	01/10/2000
45.	A. Ayinde	Snr. Motor Driver/	Chief Driver Motor/	
		Mech I, HATISS 05	Mech. HATISS 06	01/10/2000
46.	G. Anifowose	"	"	"
47.	Miss A.M. Adeniyi	Typist Gd. II,	Typist Gd. I,	
		HATISS 04	HATISS 05	25/08/99
48.	Mrs. G.B. Ogunsola	Typist Gd. III	Typist Gd. I	
		HATISS 03	HATISS 05	01/12/98
49.	Mrs. M.O. Ogbechie	"	"	01/06/98
50.	Mrs. R.A. Morakinyo	"	"	01/12/96
51.	Mrs. S.O. Ojewuyi	Snr. Catering Asst. II,	Snr. Catering Asst. I	
		HATISS 04	HATISS 05	01/10/2000
52.	Oduntan, D.	Head Watchman,	Security Guard	
		HATISS 01	HATISS 02	01/10/2000
53.	Ojo, L.I.	"	"	"
54.	Ojo, A.	"	"	"
55.	Idakpo, S.	"	"	"
56.	Nwaebili, I	"	"	"
57.	Ezechei, A.	"	"	"
58.	Inyang, B.	"	"	"
59.	Okpo, O.	"	"	"
60.	Andrew, N.	"	"	"
61.	Wabbi, Y.	"	"	"
62.	Ilori, O.	Snr. Craftsman,	Foreman	
		HATISS 04	HATISS 05	"
63.	Ehidiamen, G.	"	"	"
64.	Ejitade, D.	"	"	"
65.	Balogun, S.O.	Craftsman,	Snr. Craftsman	
		HATISS O3	HATISS 04	01/10/2000
66.	Akinyomide, N.	"	"	"

67.	Matthews, D.F.	“	“	“
68.	Ogbechie, C.	“	“	“
69.	Ogunsola, O.O.	“	“	“
70.	Salami, I.	Asst. Craftsman, HATISS 02	Craftsman, HATISS 03	01/10/2000
71.	Balogun, R.O.	“	“	“
72.	Olagoke, S.B.	Asst. Craftsman, HATISS 02	Craftsman, HATISS 03	01/10/2000
73.	Adio, E.O.	“	“	“
74.	Ikoro, I.	Snr. Motor D/Mech II HATISS 04	Snr. Motor D/Mech. I HATISS 05	“
75.	Oguntade, B.	“	“	“
76.	Sowumi, E.I.	“	“	“
77.	Adiatu, S.	Lab. Technician HATISS 04	Snr. Lab. Technician HATISS 05	“
78.	Akpata, D.	Snr. Agric. Field Overs. HATISS 04	Asst. Chief Agric Field/ Overs, HATISS O5	“
79.	Ntui, C.N.	“	“	“
80.	Sanni, J.	“	“	“
81.	Rabiu, R.	“	“	“
82.	Adeleke, M.	“	“	“
83.	Obanisola, O.	“	“	“
84.	Emiola, K.	“	“	“
85.	Akano, S.A.	“	“	“
86.	Ajao, B.	“	“	“
87.	Eworo, E.	“	“	“
88.	Otobo, P.	Agric. Field Attd. II HATISS 01	Agric. Field Attd. I HATISS 02	01/10/2000
89.	Ojo, D.	“	“	“
90.	Akinola, P.	“	“	“
91.	Olasupo, E.	“	“	“
92.	Oguntade, K.	“	“	“
93.	Adebimpe, T.	“	“	“
94.	Ogunleye, O.	“	“	“
95.	Ugwu, G.	“	“	“
96.	Osodi, P.	“	“	“
97.	Magaji, J.D.	Clerical Officer I, HATISS 04	Snr. Clerical Officer HATISS 05	“
98.	Ojua, E.O.	Clerical Officer II, HATISS 03	Clerical Officer I, HATISS 04	“
99.	Okoh, U.	“	“	“
100.	Ojo, E.O.	Messenger, HATISS 01	Snr. Messenger HATISS 02	“
101.	Adeleke, S.	“	“	“
102.	Ojo, O.	“	“	“
103.	Omoniyi, V. (Miss)	Typist Gd. III, HATISS 03	Typist Gd. II, HATISS 04	“
104.	Oyelami, R.A. (Mrs.)	“	“	“
105.	I.B. Adedera (Mrs.)	“	“	“

YEAR 2001 EXIT FROM THE SERVICE

S/NO.	NAME	DESIGNATION/HATISS	DATE OF EXIT	MODE OF EXIT
1.	Mr. B.E. Attah	Clerical Officer II, HATISS 03	01/02/01	Comp. Retirement
2.	Dr. A.A. Adeyemi	Asst. Director, HATISS 14	19/02/01	"
3.	Mr. J.O. Oduntan	Chief Motor D/Mech, HATISS 06	08/03/01	"
4.	Mr. E.A. Fawole	Asst. Chief Res. Offr. HATISS 12	13/03/01	Deceased
5.	Mr. Y. Omaghe	Craftsman, HATISS 03	06/04/01	"
6.	Onanuga C. (Mrs.)	Catering Asst., HATISS 03	02/04/01	Vol. Retirement
7.	Oyediran, F.T. (Mrs.)	Res. Officer II, HATISS 07	28/02/01	Resignation
8.	Odetola, O.A.	Maint. Engr. II, HATISS 07	09/04/01	"
9.	Obembe, D.	Agric. Field Attd. II, HATISS 01	09/02/01	Deceased
10.	Ajukwu, O.V.	Head Watchman, HATISS 01	31/03/01	Resignation
11.	S.E. Ocheni	Foreman, HATISS 05	21/04/01	Deceased
12.	J. Chubbon	Field Attd., HATISS 01		Resignation
13.	W. Raji	Agric. Field Overs. HATISS 03	07/05/01	Vol. Retirement
14.	G.A. Ogunbode (Mrs.)	Prin. Nur. Offr. HATISS 11	19/05/01	Comp. Retirement
15.	Ajewole E.	SAFO (Security)	27/05/01	"
16.	I. Baderinwa	Chief M/Driver Mech HATISS 06	16/06/01	"
17.	S.I. Yusuf	Head Messenger, HATISS 03	01/07/01	Comp. Retirement
18.	O. Adepoju	Field Attd. II, HATISS 01	14/07/01	Deceased
19.	O. Nehikhare	Higher Exec. Officer. HATISS 07	30/06/01	Resignation
20.	Mrs. R.A. Owezim	Typist Gd. III, HATISS 03	17/08/01	Deceased
21.	Saka Gbadamosi	Foreman, HATISS 05	22/08/01	Comp. Retirement
22.	Mr. J.O. Ajagbe	Chief Motor D/Mech HATISS 06	31/08/01	Comp. Retirement
23.	Mr. K. Ayinla	Agric. Field	24/09/01	Deceased
24.	F.O. Yusuf	Snr. Typist Gd. I, HATISS 07	02/10/01	Comp. Retirement
25	Dr. T.O. Adejumo	Snr. Res. Offr. HATISS 09	01/11/01	Transfer of service
26.	C. Ezeugwoke	Snr. Agric. Field, HATISS 09	14/11/01	Deceased
27.	H. Onyia	Snr. Agic Supt. HATISS 08	04/12/01	"
28.	Dr. C.R. Obatolu	Asst. Director, HATISS 14	30/11/01	"
29.	M. Oko	Head Security Guard, HATISS O3	23/12/01	Comp. Retirement
30.	Lasisi Oladipupo	Head Security Guard, HATISS 03	31/12/01	Comp. Retirement

IN-SERVICE TRAINING FOR YEAR 2001

NAME OF TRAINEE	DESIGNATION	INSTITUTION	TYPE OF COURSE	DURATION
1. Dr. C.R. Obatolu		TRIESTE, Italy	19th International Conference on coffee Science (ASIC 2000)	14/05/01 18/05/01
2. Dr. O.L. Idowu		ARMTI, Ilorin	ARMTI"s Organizational Performance Improvement Planning (ARM 309) Course	05/11/01 09/11/01
3. Mr. S.A. Asabia		Federal College of Forestry Jericho, Ibadan	Assistance Course	13/08/2001 Six months
4. Mr. S. Faniyi		"	"	"
5. Mr. J. I. Ethapemi		"	"	"
6. Mr. R.A. Madehin		ARMTI, Ilorin	Workshop on Organizational Performance Improvement Planning	05/11/01 09/11/01
7. Mr. Y. Emiola		"	"	"
8. Mr. S.O. Odeleye		"	"	"
9. Mr. L.O. Raji		"	"	"
10. Mr. A. Borokini		"	"	"
11. Mrs. O. Ogunsowo		"	"	"
12. Mr. F. Adesokan		University of Nigeria Nsukka	Training Workshop on Soil, Plant and Water analysis for Lab. Technologist	07/10/01 9/10/01
13. Mr. S.T. Lawal		Ibadan Study Centre of Ladoke Akintola Uni-Versity of Tech. Ogbomosho	Diploma Course in Transport Management	2001
14. Mr. J.O. Sote		University of Ibadan NUMNI Centre	Intensive Training Course on Registry and Records Mgt.	15/10/01 17/10/01
15. Olawale F.O. (Mrs.)		"	"	"
16. Mr. O. Sorinolu		Uni. Of Ado-Ekiti (UNAD) Ibadan Study Centre	Post Graduate Diploma on Financial Mgt.	07/06/01
17. Mr. E.O. Bakare		Y.C.T. Royal Guest House Conference Centre Yasa, Lagos	National Workshop on Nig. Corporate and Personal Income Tax Management	09/4/01 11/4/01
18. Mrs. O.A. Gbadamosi		"	National Workshop on Cashiering and Cash Management	18/4/01 20/04/02
19. Mr. K.M. Fabowale		The Institute of Chartered Accountant of Nig. Lagos Zone	National Seminar on Practices and Strategies for effective Public Expenditure Management	19-21/9/21
20. T.A. Olijogun		National Association of Professional Secretarial Staff of Nig. (NAPSSON) Fed. Poly. Ede, Osun State	11th Annual National Workshop and Exhibition of NAPSSON	8/10/01 12/10/01
21. B. Azeez		"	"	"
22. Mrs. A.M. Akintoye		"	"	"
23. Mr. E.B. Adeniyi		"	"	"
24. Mrs. B.A. Olofinro		"	"	"
25. Mr. F. Ogbajie		"	"	"
26. Mrs. C.M. Akinsiku		"	"	"
27. Mrs. M.I. Abodunde		"	"	"
28. Mrs. E.O. Adewumi		Obafemi Awolowo University Ile-Ife	Diploma Course in Marketing	

29. Mr. O. Fagbami	Centre for Management Dev. CMD Training Complex Mgt. Village, Shansisha, Lagos	Management Workshop for Heads Of Libraries Information Documentation	15/10/01 19/10/01
30. Mrs. G. Ben-Nana	National Library of Nig. Ondo Classification121/10/01 Seminar/Workshop	Annual Cataloging and State Branch, Oda Road, Akure	27/10/01

Executive Summary

Research activities in 2001 were undertaken under eight programmes viz: Cocoa, Kola, Coffee, Cashew, Tea, Socio-Economics and Techno-economic (SST), Crop Processing and Utilization (CPU) and Farming Systems Research Programmes

Cocoa
Preliminary findings showed that two applications of ACTARA 25 W.G. insecticide per season at 0.01% and 0.02% were adequate for the control of nymphs and adult mirid populations under field conditions.

Kola
In a food preference experiment, adult kolanut weevils were more attracted to fresh kolanuts than stored nuts. This finding will be consolidated for baiting of kola weevils in storage as a component of an Integrated Pest Management (IPM) programme for the control of the weevils in storage.

Eight different fungi were recorded on stored kolanuts with *Botryodiplodia* and *Fusarium* species being the most predominant. Morphological studies of the fungi assisted in their full characterization.

Coffee

At the end of the year, the achievements recorded were (i) the best intercropping combination of coffee sweet potato maize was identified, (ii) coffee training programme in two of the coffee producing zones were conducted (Plateau and Kogi in Nigeria) (iii) distribution of high yielding coffee berries, seedlings and cuttings to coffee farmers was carried out, (iv) tissue culture work showed that morphogenic response of flush (young) leaves was better than old leaves, (v) shade level of 50% was established to be most suitable for coffee production, (vi) major insect pests of *Coffea canephora* and their control in Nigeria were established, (vii) organic manure fortified with in-organic phosphorus performed better that organic fertilizer applied singly, and (viii) two Chlorpyrifos-based insecticides

such as Dursban and Pyrinex; Termicide and Endofalm were found to be good replacement for the organo-chlorine based insecticides (e.g. Aldrex, 40 EC) for the control of termites.

Cashew
Experiments on vegetative (clonal) propagation techniques using the methods of cutting, grafting and budding continued during the year. The technique if perfected will be used for the mass propagation of planting materials.

Observation of the field performance of established jumbo cashew materials in the substations also continued during the year.

Other experiments conducted during the year included assessment of the effect of soil sterlization, phosphorus types and mycorrhizal inoculations on early growth of cashew; cashew nut floatation test; use of cashew nuts of various sizes for plantation establishment and studies on the ecology of the cashew leaf miner. These experiments are on-going and were at various stages of
completion.

Tea

In 2001, observation from the field showed that tea plants under the rubber inter-rows performed better than the sole tea (tea in the open), while analysed result obtained from the tea clones available indicated significant differences in the chemical compositions of nutrient elements. Better ranking was obtained with the use of macronutrients components than the use of micronutrients or both.

Tea plants under fertilizer treatments gave better values that were significant over the control., while mixture of organic fertilizer and inorganic fertilizer at 75kg urea + 2.5 tons cowdung/ha gave the best performance. Classification of the soil from Iyanomo showed that it fell under ultisol. Out of all the available tea clones, clone 228 was observed to be most tolerant to insect pests, while ten others were considered to be highly susceptible.

SST
The percentage contribution of each agent of destruction to the losses recorded on cashew farms and the extent to which further damage by each agent can be predicted if left unattended to was analysed. Coffee trade in Nigeria was established to be technically and economically inefficient. Ways of turning this around with the Institute being the lead player were proffered.

CPU
In the year 2001, research activities were conducted with the following achievements:

(i) Boiling treatment was better than sundrying, leaching, alkali and urea treatments in detheobrominising Cocoa bean shell (CBS) for feeding laying hens.
(ii) Fresh kola testa gave better performance in snails *Archachatina marginata*) than fresh maize chaff and water leaves. The sensory evaluation of the meat of snails fed with these staples showed similar pattern.
(iii) Cashew nut shell liquid serves an effective antitimicrobial function.
(iv) Benomyl-treated cashew apple, sealed in polythene bags, had increased storage life.

Farming System Research

1. An optimum and efficient land use was achieved in Cocoa/Kola/Citrus intercrop.
2. Coppicing and chupon regeneration was found useful in rehabilitation of moribund Coffee/Kola intercrop.
3. Cocoyam/Okra/Pepper mixture was found suitable as arable intercrops in new coffee establishment.

COCOA PROGRAMME (Leader: Kolawole Badaru

Improvement of Cocoa Production, Propagation and Field Management
(Ojelade, K.T.M. and O. L. Idowu)

Determination of IPM techniques for the control of black pod disease and mirid infestation .

Activity: Further identification of cultural and chemical methods of controlling the brown cocoa mirids

Objectives: The study was conducted as part of the exercise on insecticides screening, which is aimed at sourcing for alternative insecticides for the control of cocoa mirids, in view of the ban currently placed on Lindane

Justification: Evaluation of Actara 25 WG (Nitromethylene) will enhance availability of new insecticides for the control of the cocoa mirids. This will no doubt tackle the problem of resistance often developed as a result of usage of same chemical over a long period.

Methodology: The toxicity of Actara 25WG (Nitromethylene) was determined at the peak of mirid season from October-January 2001, at CRIN Headquarters. Four concentrations of the insecticide; 0.01%, 0.013%, 0.015% and 0.02% were evaluated using a knapsack sprayer. Using a randomized complete block design, four sub-plots per block consisting of 100 trees were used for each concentration. Each insecticide was replicated four times. The following records were taken one day before and one day after each treatment application.

(i) Number of infested trees.
(ii) Number of infested pods.
(iii) Number of infested cherelles.
(iv) Number of adult mirids.
(v) Number of nymphal mirids.

The second and third treatment applications were made at 28-days interval. Percentage adult and immature mirid mortality was calculated and the relative toxicity of Actara at various concentrations were determined and compared with that of unsprayed sub-plots.

Result: From the data obtained after the first treatment application, 93.3%,

82.4%, 81.8% and 89.5% adult mortality were recorded for 0.01%, 0.13% 0.015% and 0.02% concentration, respectively. Nymphal mirid percentage mortality recorded were 12.2%, 27.2%, 60.5% and 94.3% for 0.01%, 0.013, 0.015 and 0.02% concentrations, respectively (Table 1).

Table 1: Evaluation of the Toxicity of Actara 25 WG (Nitromethylene) To Adult and Immature Cocoa, mirids – 2001

	FIRST APPLICATION		**SECOND APPLICATION**		**THIRD APPLICATION**	
INSECTICIDES CONCENTRATION	%Mortality of adult **Mirids**	%Mortality of nymphal **mirids**	%Mortality of adult **mirids**	%Mortality nymphal **mirids**	%Mortality of adult **mirids**	%Mortality of Nymphal **mirids**
ACTARA 25 WG at 0.01	93.33	89.55	100	92.86	100	100
ACTARA 25 WG at 0.01	82.35	81.48	66.7	100	100	100
ACTARA 25 WG at 0.01	81.82	86.84	100	100	100	100
ACTARA 25 WG at 0.01	100	94.29	100	100	0	100
CONTROL	-126.92	-107.69	-148.8	150	124.4	-145.2

- Negative value indicates an increase in the mired population
- Each value represents a mean of 4 replicates

Conclusion: This test indicated a variation in the toxicity of the insecticide to the nymphs and adult mirids. However, both adults and nymphal mirids were virtually eliminated after the second spray. The result tends towards suggesting two applications per season at 0.01% and 0.02% concentration for adequate mirid population control. The test shall be repeated in year 2001/2002.

KOLA PROGRAMME (Leader T.C.N. Ndubuaku)

Experimental title: Effect of colour and quality of kola nuts on the food preference of kola weevils, *Balanogastris kolae* (desbr.) Ndubuaku, T.C.N)

Introduction:

The colour of kola nuts varies from pure white to dark red. Between these are shades of pink, deep rose, and pale red. Oyebode (1973) observed that the moisture contents, starch, total reducing and non-reducing sugars continued to change significantly with growth and development of the pod. Daramola (1976) studied oviposition preference in a less common weevil, *Sorphrorhinus gbanjaensis* D. & T on the colour varieties of *C. nitida* nuts and reported that significantly higher numbers of their eggs were laid in the pink and red nuts than in the white nuts. He concluded that the result is most probably due to differences in the amount of some chemical substances yet unidentified in the nuts.

Objective: To study the food preference of *B. kolae* on nut colour and quality in terms of duration of storage and state of nut maturity at harvest and determine whether the findings could be useful in the trapping and baiting of the weevils with the preferred food types in storage baskets.

Materials and methods: The food preference of the weevils was determined using the modified Loschiavo food preference chamber as described by Laudani and Swank (1954). The chamber consisted of a circular platform 50cm in diameter, with a 5 cm metal rim. The platform had 12 holes, 8.5 cm in diameter equally spaced along the outer edge to accommodate plastic cups in which the kola nut samples (5 each) were placed. The center of the wheel cover had an opening 1.25cm in diameter fitted with a plastic tube through which 36 one-day-old adult weevils were introduced for a 24-hour exposure period.

Preference was evaluated between red and white nuts, mature and immature nuts, and between stored and fresh nuts. For each experiment, six cups were each filled with the test materials that were arranged in alternate holes. At the end of each exposure period, the insects in the cups were collected and counted to determine their distribution pattern.

Results and Discussion: Table 1 shows the distribution of kola weevils in mature kola nuts stored for 12 weeks and mature fresh kola nuts. The figures definitely show that 64.2% of the weevils were attracted to the fresh nuts and this was significantly higher than the 35% found in the stored nuts. There was no significant distribution of the weevils in the red and white nuts, which was 53.15 and 46.9% respectively (Table 2). Table 3 also shows that there was no significant difference in the distribution of the weevils in mature and immature kola nuts, which was 48.3% and 61.7 % respectively.

Summary and Conclusion: The results of this study indicates that adult kola weevils are more attracted to fresh kola nuts than stored nuts. Further investigations will be carried out to determine how fresh kola nut could be used to bait kola weevils in kola storage as a component of an Integrated Pest Management (IPM) program for the control of weevils in storage.

Table 1 : The distribution of kola weevils *Balanogastris kolae* in matured stored (12weeks) and mature fresh kolanuts after a 24 hr exposure

Type of kolanuts	Mean	Percent of total in all crops
Mature nuts	17.5a	35.8
Fresh nuts	31.5b	64.2

* The means are significantly different at 5% level

Table 2: The distribution of kola weevils *Balanogastris kolae*, in fresh mature and fresh immature kolanuts after a 24 hour exposure

Type of kolanuts	Mean	Percent of total
Mature fresh nuts	20.4a	48.3
Immature fresh nuts	21.8a	51.7

*** The means are not significant different at 5% level**

Table 3: The distribution of kola weevils, *Balanogastris kolae* in stored (12weeks) red and white kolanuts after 24 hours exposure

Type of kolanuts	Mean	Percent of total
Red	24.8a	53.1
White	21.8a	46.9

*** The means are not significant different at 5% level**

Experimental Title: **Morphological Characterization of fungi Isolated from *Cola nitida* and *Cola acuminata* in South Western Nigeria** (Agbeniyi, S.O. and Adedeji, A.R.)

Introduction :

Several fungi have been isolated from kolanuts obtained throughout the kola growing belt of Nigeria (Agbeniyi, et al, 2000). However, some of these fungi have not been identified because they did not sporulate Potato dextrose agar (PDA).

Morphological characterization of fungi is one of the most important steps in planate disease identification and control. Most of the previous works were centered on *Botryodiplodia theobromae* and *Fusarium pallidoproseum* as the causal organisms of post-harvest rot of kola (Agbeniyi and Fawole, 1998 and Agbeniyi, *et al* 2000).

Objectives; Since there was no information available on the morphological characterization of fungi associated with kola in South Western Nigeria, the study was designed to fill gaps in our understanding of the characteristics and identities of fungi associated with kolanut storage rot with a view to improving control measures.

Materials and Methods:

Studies were initiated at the Cocoa Research Institute of Nigeria (CXRIN), Ibadan to determine the cultural and morphological characterization of fungi isolated from nuts of *Cola nitida* and *Cola acuminata*.

Random samples of healthy and infected kolanuts *Cola nitida* and *C. acuminata* were collected at Ibadan and Ogunmakin for the isolation of the associated fungi. The frequency of occurrence of each fungus was expressed as described by Britton *et al* (1993). Pure cultures of each of the fungal isolate were employed for the morphological and cultural characterization. The conidia type and length were obtained through the ocular microscope under X40. Similarly, the longest hyphae, sporangiophores and conidiophores were measured. The detailed cultural characteristics were recorded at 4-10 days. Also the presence and absence of chlamydospores were recorded for each fungal isolate.

Result And Discussion :

Table 1 shows the frequencies of occurrence of the most common fungal genera on *C. nitida* and *C. acuminata*. There was significant difference (P=0.05) between the frequency of occurrence of *Fusarium* and *Botryodiplodia* spp in both C. nitida and *C. nitida* and *C. acuminata*. Whereas, no significant difference (P=0.05) was recorded between *Penicillium* and *Aspergillus* spoecies in *C. nitida*. While *Curvularia, Chlamydomyces* and *Paecilomyces* species were not found on *C. acuminata*, they were frequently isolated from *C. nitida*

Table 1: The frequency of occurrence of the most common fungal genera on *Cola nitida* and *Cola acuminata*.

Genus	Frequency of occurrence

	C. nitida	*C. acuminata*
Fusarium	0.47a	0.20b
Botryodiplodia	0.34b	0.34a
Penicillium	0.21c	0.07d
Aspergillus	0.23c	0.22b
Curvularia	0.04e	0.00d
Chamydomyces	0.03ef	0.00d
Paecilomyces	0.02f	0.00d
Mucor	0.09d	0.03c

Date were normalized by log (X + 1)

Means not followed by the same letter in the same column are significantly different (P.0.05) according to Duncan's multiple range tests.

Summary And Conclusion: The present study established the presence of eight different fungi species on kola nut. *Botryodiplodia* and *Fusarium* spp were the most frequently isolated fungi on both *C. nitida* and *C. acuminata*. The full morphological characterization has helped in final identification of these fungi.

COFFEE PROGRAMME (Leader: Dr. (Mrs.) F. A. Okelana)

Evaluation of the Effects of Storage Containers on Coffee Seed Germination
(Famaye, A. O., Adeyemi, E. A. (Mrs.), Oloyede, A. A.)

Coffee seeds are known to loose viability very easily. In order to prolong the viability of the seeds, four storage containers were evaluated viz: clay pot, desiccators, polythene bag and plastic bottle.

Five treatments were investigated viz: freshly harvested coffee seeds, those stored in clay pot, desiccator, polythene bag and plastic bottle. The treatments were replicated three times. Twenty seeds were sown per replicate.

Analysis of variance revealed that storage containers had effect on seed germination. The order of performance is fresh seeds, polythene, clay pot, plastic bottle, desiccator. However, there were no significant differences among freshly harvested seeds; seeds stored in polythene bag and clay pot. Result also revealed that desiccator is unsuitable for coffee seed storage. The experiment is to be repeated with a view of improving on the methodology and prolong time of storage.

Table 1: Effect of storage containers on germination of coffee seeds

Storage container	Percent germination	Mean germination
Freshly harvested (control/7_0)	73.33	14.67
Clay pot (7_1)	50.00	10.00
Desiccator (7_2)	25.00	5.00
Polythene bag (7_3)	56.67	11.33
Plastic bottle (7_4)	45.00	9.00
LSD (0.05)		5.44

Comparative Evaluation of Two Organic Wastes Fortified with Different P-Fertilizers on Robusta Coffee Seedlings (Ibiremo O.S)

The study began in 2000 and this thrust was to evaluate the effect of integrating organic-fertilizers with phosphate fertilizers (Single superphosphate (SSP)and Sokoto rockphosphate(SRP) on coffee seedlings.

Soil samples were taken from old coffee plantations at 0-15cm (depth).The soil Samples were air-dried and made to pass through 2mm sieve. Some physico-chemical properties of the soil used before experimentation are presented in Table 1. The soil was fed into 12 x 25cm (external dimension) polythene bags. Fifteen (15) fertilizer treatments were formed from two organic fertilizers (Cocoa pod husk and Cow dung) and were applied at 0 and 10 tons/ha and were variously combined with two sources of phosphorus fertilizers. Each phosphate fertilizer was applied at 0, 30 and 60kg P_20_5/ha. The treatment combinations were applied to 2-month old coffee seedlings. The experimental design used was completely randomized design. Growth parameters viz: plant height, stem diameter, leaf area and number of leaves were measured during the period of experimentation.

Table 1: Pre-cropping Physico-chemical Properties of the soil (alfisol) used for the experiment.

Soil Parameters at (0 –15cm)	Unit	Value
Sand	g/kg	694.00
Silt	g/kg	149.60
Clay	g/kg	156.40
Textural Class		Sandy loam
PH		6.65
Organic Carbon	g/kg	9.10
Total N	g/kg	8.1
Available P	Mg/kg	8.76
EXC Potassium	C mol/kg	0.40
,, Calcium	,,	2.96
,, Magnesium	,,	1.28

The result indicated that coffee performed significantly better when SSP (60kg P_20_5) and Cowdung were applied in terms of plant height, stem diameter than when applied alone or when SRP was applied (Table 2). Table 3 showed the influence of P-fortified organic fertilizer on P-uptake and internal efficiency of SRP and SSP. Coffee P-uptake was highest when SSP was applied at 60kg P_20_5 and the least was when SRP was applied at 60kg P_20_5/ha in combination with Cow dung. The highest internal fertilizer efficiency was obtained when SSP was applied at 60kg P_20_5/ha while the least was obtained at 60kg P_20_5/ha

Table 2: Effect of Phosphorus and Organic fertilizers on Coffee growth Parameters.

Treatment	Plant height cm	Stem diameter cm	Leaf area cm
T_1 CD + SSP 60kg P_20_5/ha	32.25^{b}	0.30^{ab}	86.40^{a}
T_2 CPH + SSP 30kg P_20_5/ha	20.97^{c}	0.29^{ab}	49.27^{d}
T_3 CPH + SSP 60kg P_20_5/ha	30.97^{b}	0.35^{a}	66.80^{c}
T_4 SSP 30kg P_20_5/ha	26.49^{b}	0.37^{a}	78.26^{b}
T_5 SSP 60kg P_20_5/ha	40.35^{a}	0.39^{ab}	87.16^{a}
T_6 CPH + SRp 30kg P_20_5/ha	22.32^{bc}	0.26^{ab}	45.48^{d}
T_7 SRP 30kg P_20_5/ha	27.95^{b}	0.29^{ab}	49.99^{d}
T_8 CD + SRP 30kg P_20_5/ha	29.85^{b}	0.28	65.63^{c}
T_9 CPH + SRP 60kg P_20_5/ha	18.75^{c}	0.28^{ab}	41.35^{e}
T_{10} CD + SRP 60kg P_20_5/ha	23.40^{bc}	0.28^{ab}	55.11^{d}
T_{11} SRP 60kg P_20_5/ha	23.75^{bc}	0.26^{ab}	49.05^{d}
T_{12} CPH	23.47^{bc}	0.30^{b}	54.39^{d}
T_{13} CD	29.77^{b}	0.28^{b}	81.69^{a}
T_{14} CD + SSP 60kg P_20_5/ha	22.55^{bc}	0.24^{b}	41.81^{c}
T_{15} Control	25.50^{b}	0.24^{b}	71.04^{b}

Values with the same letters in the columns do not differ significantly at P = 0.05 (DMRT)

CD = Cowdung, SSP = Single Super phosphate

CPH = Cocoa Pod Husk SRP = Sokoto rockphosphate

Table 3: The Influence of P-forfitied organic fertilizers on p-uptake and internal efficiency of SRP & SSP

	Treatment	P uptake	Internal efficiency
1.	CD + SSP 60 kg P_20_5/ha	2.37[b]	-
2.	CPH + SSP 30kg P_20_5/ha	0.65[d]	-
3.	CPH + SSP 60kg P_20_5/ha	1.14[c]	-
4.	SSP 30kg P_20_5/ha	1.39[c]	3.56
5.	SSP 60kg P_20_5/ha	3.29[a]	2.38
6.	CPH + SRP 30kg P_20_5/ha	0.38[d]	-
7.	SRP 30kg P_20_5/ha	1.31[c]	2.94
8.	CD + SRP 30kg P_20_5/ha	1.91[c]	-
9.	CPH + SRP 60kg P_20_5/ha	0.61[d]	-
10.	CD + SRP 60kg P_20_5/ha	0.31[d]	-
11.	SRP 60kg P_20_5/ha	0.73[d]	3.34
12.	CPH	0.73[d]	-
13.	CD	1.38[c]	-
14.	CD + SSP 30kg P_20_5/ha	0.36[d]	-
15.	Control	1.54[c]	-
	Mean	1.21	-
	S.E	3.21	-

Values with the same letters in the columns do not differ significantly at P = 0.05 (DMRT)

CD = Cowdung, SSP = Single Super phosphate

CPH = Cocoa pod husk SRP = Sokoto rockphosphate

Effect of Integrating Organic Fertilizers with Inorganic Phosphate Fertilizers on Coffee Seedlings.

The experiment is similar to the one started in year 2000 except that a different soil type (Ultisol) from Uhonmora was used.

The objective is to evaluate coffee seedling's performance when grown with phosphorus-forfitied organic manures in an ultisol.

The procedure was the same with the year 2000 experiment. The results for the first three months for plant height, stem diameter and leaf area are presented overleaf..

Table 1: The initial physico-chemical properties of the soil (Ultisol) used for the experiment.

Soil Parameters at (0 –15cm)	Unit	Value
Sand	g/kg	609.80
Silt	g/kg	151.40
Clay	g/kg	238.80
Textural Class		Sandy clay loam
pH		5.85
Organic Carbon	g/kg	8.40
Total N	g/kg	1.9
Available P	mg/kg	10.38
EXC Potassium	Cmol/kg	0.68
Calcium	Cmol/kg	4.87
Magnesium	Cmol/kg	2.98

Table 2: The effect of P-fortified organic manures on coffee seedlings grown an ultisol.

Treatment		3 M A T		
		Plant Height (cm)	Stem diameter cm	Leaf area (cm2)
T_1	CD + SSP 60 kg P_2O_5/ha	15.87	0.24	50.97
T_2	CPH + SSP 30kg P_2O_5/ha	20.40	0.25	67.34
T_3	CPH + SSP 60kg P_2O_5/ha	26.73	0.31	84.34
T_4	SSP 30kg P_2O_5/ha	17.40	0.23	59.79
T_5	SSP 60kg P_2O_5/ha	19.00	0.21	68.86
T_6	CPH + SRP 30kg P_2O_5/ha	17.43	0.26	57.82
T_7	SRP 30kg P_2O_5/ha	18.07	0.19	58.05
T_8	CD + SRP 30kg P_2O_5/ha	12.37	0.18	49.97
T_9	CH + SRP 60kg P_2O_5/ha	19.50	0.25	57.77
T_{10}	CD + SRP 60kg P_2O_5/ha	20.17	0.25	57.38
T_{11}	SRP 60kg P_2O_5/ha	12.40	0.22	40.87
T_{12}	CPH	16.20	0.23	59.47
T_{13}	CD	8.93	0.12	28.62
T_{14}	CD + SSP 30kg P_2O_5/ha	14.50	0.19	44.23
T_{15}	Control	8.57	0.16	27.29
	Mean	16.26	0.22	54.18
	S.E	1.20	0.06	3.84

The result indicated that cocoa pod husk (CPH) combined with 60kg P_2O_5/ha SSP gave the highest plant height (26.73 cm) and the least (8.57 cm) was the control (without fertilizer). The stem diameter and the leaf area gave similar trend. The stem diameter ranged from 0.16cm to 0.31cm and leaf area ranged from 27.29 to 84.34cm^2. The experiment is on going and it will be concluded in the year 2002.

Rehabilitation of moribund coffee/kola intercrop (A.O. Famaye, E.A. Adeyemi and A.A. Oloyede,.)
In order to rejuvenate the unproductive intercrop plot established in 1934 (67 years ago),
the plot was demarcated into 9 plots of 18mx18m consisting of three (3) treatments replicated thrice. The treatments were:- Total replanting, coppiced and control (old plot retained). Total

replanting treatment involved re-establishment of the plot with 36 coffee seedlings and 4 kola seedlings at 3x3m and 9x9m plant spacing respectively. For the coppiced plot, the coffee and kola were cut at 30cm and 60cm respectively above soil level. Rejuvenated coffee shoots were thinned to 4, while kola stands were thinned to 2 shoots for data collection.

Data were collected on survival count of seedlings, rate of shoot regenerated on coppiced stands, plant height, girth and number of leaves of seedlings and regenerated shoots. Percentage seedlings survival were 44.44 for coffee, 66.66 for kola and 11.50 for rate of shoots regenerated for coppiced kola (Table 1). The growth situation as reflected in (Table 2) is 46.27cm, 0.76cm, 18.0 for height, girth and number of leaves. The experiment is in progress and meaningful comparison will be made at fruiting.

Table 1: Mean seedling survival, stands regenerated and shoots regenerated at 3 Months after Establishment.

Crop	Percentage survival count (seedlings)	% coppiced stand regenerated	Mean number shoot regenerated
Coffee	44.44	-	-
Kola	66.66	83.33	11.50

Table 2: Mean height, girth and number of leaves of regenerated shoots at 3 months after coppicing.

Crop	Height (cm)	Girth (cm)	Number of Leaves
Coppiced coffee	46.27	0.76	18.19
Coppiced kola	64.32	1.33	43.79
Replanted coffee	34.83	0.54	6.08
Replanted kola	30.32	0.50	7.25

***In vitro* micro propagation of coffee using different explant types** (Bright-Agindotan, C.J, S.S Omolaja)

The experiment was conducted to facilitate the rapid multiplication of coffee explants to ease the transportation of planting materials and to produce disease- free materials.

Flush/ old leaves from 5 coffee clones: G129, T1049, C111, T24, D57 were used. The flush leaves were surface- sterilized using 10% Liquid NaOCL for 10 minutes and rinsed 3 times with sterile distilled water after which they were blotted dry and cut into 4 x 4 cm shape. They were plated on modified MS media.

Table I shows the type of morphogenic responses observed on the different clones used. It was observed that after 5 days, the tertiary old leaves turned brown and by the 14^{th} day, all had turned brown with no noticeable expansions and foldings. The secondary leaves remained green for a maximum period of 10days on all the media types after which they leached out gradually by turning yellowish and then brownish by he 14^{th} day.

The same trends were observed in all the clones and the growth media used. However, with the flush leaves, responses varied among the clones and also amongst the growth regulators as can be seen in the Table 1.

Table 1 : Type of morphogenic response in different Clones

Clones	**Type of morphogenic response**

G129	callus
T1049	callus
C111	callus, somatic embryos rhizogenes
T24	callus
D57	callus

Determination of suitable intercropping systems in Coffee: Weeds suppression under coffee/arable intercropping system (Oloyede, A. A., Famaye, A. O)

: Five treatments were investigated viz:

(i) Coffee / sweet potato/maize;
(ii) Coffee/cassava/maize;
(iii) Coffee/cassava;
(iv) Coffee/cocoyam/okra/pepper
(v) Coffee sole.

Quadrant of dimension 30cm x 30cm was thrown three times per treatment for the weed biomass. The wet and dry weights were measured using Sartorious balance.

Analysis of variance revealed no significant difference in the weed suppression. However weed suppression was more in coffee/potato/maize plot. The order of weed suppression (wet weight) of intercrop over the control (sole coffee) is coffee/sweet potato/ maize (46.66%)>coffee/ Cassava (31.36%)> coffee/cocoyam/okra/pepper (27.79%)>coffee/cassava/maize (16.58%). For weed dry weight suppression. The order was coffee/sweet potato/maize (59.36%)> coffee/cocoyam/okra/pepper(47.67%)>coffee/cassava(37.03%)>coffee/cassava/maize (36.60%). Table 1 shows the mean values for weed wet and dry weights.

Table 1: Mean weed biomass under coffee/arables intercrop.

	Weed Biomass	
Treatment	Wet weight	Dry weight
(i) Coffee/sweet potato/maize	53.09	8.45
(ii) Coffee/cassava/maize	83.03	13.18
(iii) Coffee/cassava	68.32	13.09
(iv) Coffee/cocoyam/okra/pepper	71.87	10.88
(v) Coffee sole	99.53	20.79
LSD (0.05)	NS	NS

Recommendation: Intercropping of coffee with arables may be encouraged as it reduces the occurrence of weed infestation, though not statistically. The experiment is however on-going.

Preliminary Investigation of the Termicidal Activity of Chlorpyrifos and Hexachloro-Cyclohexane in South Western Nigeria(E.U. Asogwa and F.A. Okelana).

Following the ban on the use of Organochlorines (DDT, Gammalin 20 EC etc.) due to their negative effects on the environment and humans, there was the need to screen new classes of insecticides (termiticides) for the control of termites. Studies were carried out at the Cocoa Research Institute of Nigeria, Ibadan to determine the efficacy of three brands of Chloropyrifos

(Pyrinex 48 EC, Dursban 4EC and Termicid) and Hexachloro-cyclohexane(Endosulfan) on termites (workers and soldier castes).

The Laboratory bioassay of the termiticides was carried out under ambient room temperature of 26-32^{o}C and R.H of between 80-88%. The experimental design was a Completely Randomized Design (CRD), with 7 treatments and 4 replicates.

Results: The results showed that in topical/residual contact action tests, an adult worker mortality rate of between 90%-100%, 82.5%-100%, 82.5%-100% and 90%-100% was recorded for Pyrinex, Termicid, Dusban and Endosulfan respectively within 1 hour following topical and residual contact tests. For the soldier caste, the mortality rate was between 17.5%-72.5%, 22.5%-77.5%, 22.5%-77.5% and 35%-95% respectively for Pyrinex, Termicid, Dursban, and Endosulfan 2 hours after application. However, none of the termiticide concentration had fumigant action against the termites (workers and soldiers) when exposed to different concentration.

Conclusion: It is worthy of note that there was no significant difference among the termiticides tested. Every one of them could be utilized effectively for termite control depending on costs and availability. Finally, field trials with the termiticide should be carried out to confirm the high mean mortality achieved in this study.

Table 1; Mean mortality rate of Pyrinex on termites(worker and soldier castes) following Topical, Residual and Fumigant action tests. (n=10/replicate)*

	Topical	**Residual**	**Fumigant action**
Worker Caste**:**			
Control .(x)	0.7^{a}(2.5%)	0.7^{a}(2.5%)	0.7^{a}(2.5%)
0ppm	0.7^{a}(2.5%)	0.7^{a}(2.5%)	0.7^{a}(2.5%)
125ppm	3.0^{b}(90%)	3.0^{b}(90%)	0.7^{a}(2.5%)
250ppm	3.1^{b}(95%)	3.1^{b}(95%)	0.7^{a}(2.5%)
500ppm	3.2^{b}(100%)	3.2^{b}(100%)	0.7^{a}(2.5%)
1000ppm	3.2^{b}(100%)	3.2^{b}(100%)	1.0^{a}(10%)
2000ppm	3.2^{b}(100%)	3.2^{b}(100%)	1.2^{a}(12.5%)
Soldier Caste:			
Control .(x)	0.7^{a}(2.5%)	0.7^{a}(2.5%)	0.7^{a}(2.5%)
0ppm	0.7^{a}(2.5%)	0.7^{a}(2.5%)	0.7^{a}(2.5%)
125ppm	1.6^{b}(2.5%)	0.7^{a}(2.5%)	0.7^{a}(2.5%)
250ppm	2.1^{b}(42.5%)	0.7^{a}(2.5%)	0.7^{a}(2.5%)
500ppm	2.2^{bc}(47.5%)	1.4^{a}(17.5%)	0.7^{a}(2.5%)
1000ppm	2.7^{d}(72.5%)	1.7^{b}(27.5%)	0.8^{a}(5%)
2000ppm	2.7^{d}(72.5%)	1.7^{b}(27.5%)	1.0^{a}(10%)

* Square root transformed data.

Means in a column with different superscripts are significantly different from each other at P = 0.05 level DMRT ($P<0.05$)

Table 2; Mean mortality rate of Termicid on termites (workers and soldier castes) following Topical, Residual and Fumigant action tests. (n = 10/replicate)*

	Topical	**Residual**	**Fumigant action**
Worker Caste:			
Control .(x)	0.7^{a}(2.5%)	0.7^{a}(2.5%)	0.7^{a}(2.5%)
0ppm	0.7^{a}(2.5%)	0.7^{a}(2.5%)	0.7^{a}(2.5%)
125ppm	3.2^{b}(100%)	2.9^{b}(82.5%)	0.7^{a}(2.5%)
250ppm	3.2^{b}(100%)	3.0^{bc}(90%)	0.7^{a}(2.5%)
500ppm	3.2^{b}(100%)	3.1^{bc}(95%)	0.8^{a}(5%)
1000ppm	3.2^{b}(100%)	3.2^{c}(100%)	1.0^{a}(10%)
2000ppm	3.2^{b}(100%)	3.2^{c}(100%)	1.2^{a}(12.5%)
Soldier Caste:			

Control .(x)	0.7[a](2.5%)	0.7 [a](2.5%)	0.7 [a](2.5%)
0ppm	0.7[a](2.5%)	0.7 [a](2.5%)	0.7 [a](2.5%)
125ppm	1.8[b](30%)	1.5 [b](22.5%)	0.7 [a](2.5%)
250ppm	2.1[b](42%)	1.7 [b](27.5%)	0.7 [a](2.5%)
500ppm	2.4[bc](57.5%)	1.8[b](30%)	0.7 [a](2.5%)
1000ppm	2.7[d](72.5%)	1.9[b](30%)	1.0 [a](10%)
2000ppm	2.8[d](77.5%)	2.0[b](40%)	1.0 [a](10%)

* Square root transformed data.
Means in a column with different superscripts are significantly different from each other at P = 0.05 level DMRT (P<0.05)

Table 3: Mean mortality rate of Dursban on termites (workers and soldiers caste) following Topical, Residual and Fumigant action tests. (n=10/replicate)*

	Topical	**Residual**	**Fumigant action**
Worker Caste:			
Control .(x)	0.7[a](2.5%)	0.7 [a](2.5%)	0.7 [a](2.5%)
0ppm	0.7[a](2.5%)	0.7 [a](2.5%)	0.7 [a](2.5%)
125ppm	3.1[b](95%)	2.9[b](82.5%)	0.7 [a](2.5%)
250ppm	3.2[b](100%)	3.1[bc](95%)	0.7 [a](2.5%)
500ppm	3.2[b](100%)	3.2[c](100%)	0.8 [a](5%)
1000ppm	3.2[b](100%)	3.2[c](100%)	1.8 [a](5%)
2000ppm	3.2[b](100%)	3.2[c](100%)	1.1 [a](10%)
Soldier Caste:			
Control .(x)	0.7[a](2.5%)	0.7 [a](2.5%)	0.7 [a](2.5%)
0ppm	0.7[a](2.5%)	0.7 [a](2.5%)	0.7 [a](2.5%)
125ppm	1.8[b](30%)	1.0 [a](10%)	0.7 [a](2.5%)
250ppm	2.1[b](42.5%)	1.2 [a](12.5%)	0.7 [a](2.5%)
500ppm	2.3[b](52.5%)	1.9[ab](35%)	0.7 [a](2.5%)
1000ppm	2.6[bc] (67.5%)	1.9[b](35%)	0.8 [a](5%)
2000ppm	2.8[c](77.5%)	2.1[b](42.5%)	0.8 [a](5%)

* Square root transformed data.
Means in a column with different superscripts are significantly different from each other at P = 0.05 level DMRT (P<0.05)

Table 4: Mean mortality rate of Endosulfan on termites (worker and soldier castes) following Topical, Residual and fumigant action tests. (n=10/replicate)*

	Topical	**Residual**	**Fumigant action**
Worker Caste:			
Control .(x)	0.7[a](2.5%)	0.7 [a](2.5%)	0.7 [a](2.5%)
0ppm	0.7[a](2.5%)	0.7 [a](2.5%)	0.7 [a](2.5%)
125ppm	3.1[b](95%)	3.0[b](90%)	0.7 [a](2.5%)

250ppm	3.1[b](95%)	3.0[b](90%)	0.7 [a](2.5%)
500ppm	3.2[b](100%)	3.2[b](100%)	0.7 [a](5%)
1000ppm	3.2[b](100%)	3.2[b](100%)	1.0 [a](10%)
2000ppm	3.2[b](100%)	3.2[b](100%)	1.4 [a](17.5%)
Soldier Caste:			
Control .(x)	0.7[a](2.5%)	0.7 [a](2.5%)	0.7 [a](2.5%)
0ppm	0.7[a](2.5%)	0.7 [a](2.5%)	0.7 [a](2.5%)
125ppm	2.3[b](52.5%)	1.8 [b](30%)	0.7 [a](2.5%)
250ppm	2.6[b](67.5%)	1.9 [b](35%)	0.7 [a](2.5%)
500ppm	2.7[bc](72.5%)	2.1[b](42.5%)	0.7 [a](2.5%)
1000ppm	3.0[c](90%)	2.1[b](42.5%)	1.0 [a](10s%)
2000ppm	3.1[cd](95%)	2.1[b](42.5%)	1.0 [a](10%)

* Square root transformed data.
Means in a column with different superscripts are significantly different from each other at P = 0.05 level DMRT (P<0.05)

Preliminary Evaluation of the Effectiveness of Some Dusts and Granules for the Control of Termites in Western Nigeria. (E.U .Asogwa and F.A. Okelana)

The effectiveness of using the Organochloride termiticides (Aldrin dust, Aldrex T., Dieldrex) as a seed treatment, on seedlings, mature plants and for tree protection against termites is widely known. However, following the ban on the use of orgonochlorines due to their devastating effects on the environment and humans, there is the need to exploit other classes of insecticides for the control of termites. Four classes of granules/dusts, Carbofuran (Furadan 3G); Metalaxy/carboxin/Furathiocarb (Apron plus 50 DS); Pirimiphos methyl (Acetellic D) and permethrin (Pif-paf powder) were therefore selected for the control trials on termites (worker and soldier castes). A completely Randomized Design with 7 treatments and 4 replicates was used for the Laboratory bioassay of the termiticides under ambient room temperature of 26-32^{o}C and RH of between 80-88%. The results showed that the active constituent of the granules/dusts could confortably be replaced with 95.2% w/w (1.20) of inert materials (sawdust or sand) without wiltering their efficacy on the worker caste. For the topical/residual contact, between 77.5-100% mortality of adults (workers) occurred within 1 hour of application. The trend was not the same on the soldier caste, which showed a low mortality rate of between 5%-67.5% after 2 hours of their application.

Conclusion
The achievement of comfortably replacing the active constituent of these granules/dusts with 95.2%w/w (1:20) of inert materials (sawdust or sand) will make for effective utilization of these termiticides and save the farmers some reasonable costs.

Table 1: Effect of topical application and residual contact action of Furadan/sawdust and Furadan/sand mixture on mean morality of termites (n=10/replicate)

Mean Mortalities

	(Furadan/sawdust)		**(Furadan/Sand)**	
	Topical	**Residual**	**Topical**	**Residual**
Worker Caste:				
Control (x)	0.7[a](2.5%)	0.7 [a](2.5%)	0.7 [a](2.5%)	0.7 [a](2.5%)

1:0 (0%w/w)	3.2[b](100%)	3.2 [b](100%)	3.2 [b] (100%)	3.2[b] (100%)
1:1(50%w/w)	3.2 [b](100%)	3.2 [b](100%)	3.2 [b] (100%)	3.1[bc] (95%)
1:5(83.3%w/w)	3.1 [bc](95%)	3.0 [bc](90%)	3.1 [b] (95%)	3.1 [bc] (95%)
1:10(90.9%w/w)	3.1 [bc] (95%)	2.9[c](82.5%)	3.1 [b] (95%)	3.0 [bc] (90%)
1:15(93.8%w/w)	3.0 [bc] (90%)	2.9[c](82.5%	3.1 [b] (95%)	2.9[c] (82.5%)
1:20 (95.2% w/w)	2.9[c](82.5%)	2.8[c](77.5%)	3.0 [b] (90%)	2.9[c] (82.5%)
Soldier Caste:				
Control (x)	0.7[a](2.5%)	0.7 [a](2.5%)	0.7 [a](2.5%)	0.7 [a](2.5%)
1:0 (0%w/w)	2.6[b](67.5%)	1.1[a](10%)	2.6 [b] (67.5%)	1.2[a] (12.5%)
1:1(50%w/w)	2.4 [bc](57.5%)	0.8[a](5%)	2.4 [bc] (57.5%)	1.1[a] (10%)
1:5(83.3%w/w)	2.1 [c](42.5%)	0.8[a](5%)	2.2[c] (47.5%)	0.8[a] (5%)
1:10(90.9%w/w)	2.0 [c] (40%)	0.7[a](2.5%)	2.1 [c] (42.5%)	0.0[a] (5%)
1:15(93.8%w/w)	2.0 [c] (40%)	0.7[a](2.5%	2.0 [c] (40%)	0.7[a] (2.5%)
1:20(95.2% w/w)	1.9[cd](30%)	0.7[a](2.5%)	2.0 [c] (40%)	0.7[a] (2.5%)

*Square root transformed data.
Means within a column followed by different superscripts are significantly different at 5% DMRT (P<0.05)

Table 2: Effect of topical application and residual contact action of Apron plus/sawdust and Apron plus/sand mixture on mean mortality of termites (n=10/replicate)*

Mean mortalities

	Apron plus/sawdust		Apron plus/sand	
	Topical	**Residual**	**Topical**	**Residual**
Worker Caste:				
Control (X)	0.7[a](2.5%)	0.7 [a](2.5%)	0.7 [a](2.5%)	0.7 [a](2.5%)
1:0 (0%w/w)	3.2[b](100%)	3.2 [b](100%)	3.2 [b] (100%)	3.2[b] (100%)
1:1(50%w/w)	3.2 [b](100%)	3.2 [b](100%)	3.2 [b] (100%)	3.2[b] (100%)
1:5(83.3%w/w)	3.2 [b](100%)	3.2 [b](100%)	3.2 [b] (100%)	3.0 [bc] (90%)
1:10(90.9%w/w)	3.2 [b] (100%)	3.2[b](100%)	3.2 [b] (100%)	2.9[c] (82.5%)
1:15(93.8%w/w)	3.1[b] (95%)	3.1[b](95%	3.2 [b] (100%)	2.9[c] (82.5%)
1:20 (95.2% w/w)	3.1[b](95%)	3.0[b](90%)	3.1 [b] (95%)	2.9[c] (82.5%)
Soldier Caste:				
Control (X)	0.7[a](2.5%)	0.7 [a](2.5%)	0.7 [a](2.5%)	0.7 [a](2.5%)
1:0 (0%w/w)	1.2[a](12.5%)	1.0[a](10%)	1.9 [b] (35%)	1.0[a] (10%)
1:1(50%w/w)	0.8[a](5%)	0.8[a](2.5%)	1.3 [bc] (15%)	0.8[a] (5%)
1:5(83.3%w/w)	0.8 [a](5%)	0.8[a](2.5%)	1.1[c] (10%)	0.7[a] (2.5%)
1:10(90.9%w/w)	0.7 [a] (2.5%)	0.7[a](2.5%)	0.8 [c] (5%)	0.7[a] (2.5%)
1:15(93.8%w/w)	0.7 [a] (2.5%)	0.7[a](2.5%	0.7 [c] (2.5%)	0.7[a] (2.5%)
1:20(95.2% w/w)	0.7[a](2.5%)	0.7[a](2.5%)	0.7 [c] (2.5%)	0.7[a] (2.5%)

*Square root transformed data.

Means within a column followed by different superscripts are significantly different at 5% DMRT (P<0.05)

Table 3: Effect of topical and residual contact action of Actellic dust/sawdust and Actellic dust/sand mixture on mean mortality of termites (n=10/replicate)*

Mean mortalities

	Actellic/sawdust		Actellic/sand	
	Topical	**Residual**	**Topical**	**Residual**
Worker Caste:				
Control (X)	0.7^{a}(2.5%)	0.7^{a}(2.5%)	0.7^{a}(2.5%)	0.7^{a}(2.5%)
1:0 (0%w/w)	3.2^{b}(100%)	3.2^{b}(100%)	3.2^{b} (100%)	3.2^{b} (100%)
1:1(50%w/w)	3.2^{b}(100%)	3.2^{b}(100%)	3.2^{b} (100%)	3.2^{b} (100%)
1:5(83.3%w/w)	3.2^{b}(100%)	3.2^{b}(100%)	3.2^{b} (100%)	3.0^{bc} (90%)
1:10(90.9%w/w)	3.1^{b} (95%)	3.1^{bc}(95%)	3.1^{b} (95%)	3.1^{bc} (82.5%)
1:15(93.8%w/w)	3.1^{bc} (95%)	2.9^{b}(82.5%)	3.0^{b} (90%)	3.0^{bc} (90%)
1:20 (95.2% w/w)	2.9^{b}(82.5%)	3.0^{bc}(90%)	2.8^{c} (77.5%)	2.9^{c} (82.5%)
Soldier Caste:				
Control (X)	0.7^{a}(2.5%)	0.7^{a}(2.5%)	0.7^{a}(2.5%)	0.7^{a}(2.5%)
1:0 (0%w/w)	1.2^{a}(12.5%)	1.0^{a}(10%)	1.9^{b} (35%)	1.0^{a} (10%)
1:1(50%w/w)	0.8^{a}(5%)	0.8^{a}(2.5%)	1.3^{bc} (15%)	0.8^{a} (5%)
1:5(83.3%w/w)	0.8^{a}(5%)	0.8^{a}(2.5%)	1.1^{c} (10%)	0.7^{a} (2.5%)
1:10(90.9%w/w)	0.7^{a} (2.5%)	0.7^{a}(2.5%)	0.8^{c} (5%)	0.7^{a} (2.5%)
1:15(93.8%w/w)	0.7^{a} (2.5%)	0.7^{a}(2.5%	0.7^{c} (2.5%)	0.7^{a} (2.5%)
1:20(95.2% w/w)	0.7^{a}(2.5%)	0.7^{a}(2.5%)	0.7^{c} (2.5%)	0.7^{a} (2.5%)

*Square root transformed data.
Means within a column followed by different superscripts are significantly different at 5% DMRT (P<0.05)

CASHEW PROGRAMME (Leader : Ayodele, E. A.**)**

Cashew Nut Sizes: Preliminary Results of field performance (Adeyemi, E.A. (Mrs.)

Propagation of cashew is generally effected through the use of seeds. Seedlings of superior qualities could be produced from seeds of selected mother trees that possess the economic traits. Therefore, in the establishment of cashew plantation it is desirable to use plant materials that possess desirable traits of high yield, big nut size and resistance to pests and diseases. It is to this end that investigation into the field performance of four cashew nut sizes and weights was initiated.

Jumbo (<16gm), large (8 - < 12gm), medium (4 - < 8gm) and small (< 4gm) cashew nut sizes were used to raise seedlings in the nursery which were transplanted to the field in August 2000 at CRIN Headquarters in Ibadan.

On the field, 4 blocks of $60x90m^2$ each were located, with each block representing a cashew nut size. Cashew seedlings were transplanted in 7 rows of 11 stands each at 9mx9m plant spacing. Seedlings on the even rows and at even stands were tagged for data collection at monthly interval. Three (3) rows per block and 5 seedlings per row were tagged for a total of 15 seedlings per block (nut size).

Plant height was obtained using meter rule, stem diameter was obtained using vernier caliper; number of leaves and plant branches were obtained by usual counting while the leaf area was by using meter rule to determine the length and breadth (LxB) of the leaves and the product was multiplied by a factor of 0.6 (Ajayi, 1990). The data obtained were analysed statistically using descriptive statistics and multidimensional statistical analysis (MDA) (Gomez and Gomez, 1984) for favourable ranking of the various nut sizes.

Prior to field establishment, soil samples from the site were collected and subjected to laboratory analysis using conventional methods.

The results of the soil's physico-chemical properties are indicated in Table 1. The soil parameters were generally above the critical values considered for cashew cultivation.

The survival count data indicated that the jumbo nut size has more survival couts than others. (Table 2). The effect of nut sizes on the growth parameters is shown in Table 3.

On ranking the parameters using multidimensional statistical analysis (MDA), the large nut size was found to give the best overall performance followed by the jumbo nut size and least for the medium nut size (Table 4). It would therefore be advised that the large cashew nut size should be made use of in cashew plantation establishment but for economic reasons on cost of establishment on one hand and market values of the products on the other hand, the jumbo nut size would be advised for cashew plantation establishment. This is because the jumbo nuts are more marketable in the world market and this should be given more preference for such an economic venture.

Table 1: Physical and Chemical composition of the soil at experimental site

Property	Value
Sand (gm)	694
Silt (gm)	149.6
Clay (gm)	156.4
%C	0.91
% N	0.81
P(Mg/kg)	8.76
K(Cmol/kg)	0.40
Ca(Cmol/kg)	2.96

Table 2: Survival count of cashew seedlings

	Number		
Cashew Nut size	Alive	Dead	%
Jumbo	94	32	75.0
Large	77	49	61.1
Medium	82	41	66.7
Small	58	52	53.0

Table 3: Effects of cashew nut sizes on growth parameters after fifteen months of Establishment.

Cashew nut Size	Height (cm)	Girth (cm)	No. of Leaves	No. of Branches	Leaf area (cm^2)
Jumbo	80.5	1.74	52	7.0	106.24
Large	100.13	1.84	58	7.0	137.5
Medium	89.30	1.60	50	6.0	119.27
Small	94.97	1.63	66	7.0	124.54
Mean	91.23	1.70	56.6	6.75	121.89

Table 4: Ranking of cashew nuts based on agronomic performance of the seedlings using MDA

Cashew nut size	Height	Girth	No. of leaves	No. of Branches	Leaf area	Survival %	Score	Ranking
Jumbo	4	2	3	1	4	1	15	2nd
Large	1	1	2	2	1	3	9	1st

Medium	3	4	4	4	3	2	20	4th
Small	2	3	1	3	2	4	15	3rd

This work was presented at 39th Annual Conference of Science Association of Nigeria (SAN) in November, 2001

Development of rapid method of propagating improved cultivars of cashew through budding, grafting and marcotting (Aliyu, O. M**)**

Objective: To develop and perfect an effective propagation method of budding and grafting in cashew for large scale production of planting materials for Nigerian farmers.

Methodology: Six hundred rootstocks were raised from the medium-sized nuts, which have been reported to produce vigorous seedlings. Three hundred rootstocks were used for budding and grafting trials each. Each stock was further grouped into six classes on the basis of rootstock age i.e. 2, 3, 4, 5, 6 and 7 months, thereby having a total of 50 rootstocks per age group. Budwoods of young twigs about a year old with average thickness of 1.5cm were collected for these trials. Patch budding technique was used in the budding experiment while cleft method was employed in the grafting trial. Grafted seedlings were opened 14 days after the operation and number of "takes" were recorded. The grafted rootstocks were further grouped into two i.e. opened and covered (those covered with polythene sheets) for each month's trial.

Result: Budding

The work on cashew budding started in the year 2000 with success rate of bud take ranging between 10 and 44%; and sprouting percentage between 0 and 14%. The results recorded in this year 2001 trial do not show any significant improvement. Table 1 below showed the success rate in cashew budding.

Table 1: Percentage success in Cashew budding trial.

Age of Rootstocks (Months)	Number Budded	No. of Bud-Take	No. of Sprouted Buds.
2	50	17 (34%)	3 (6%)
3	50	20 (40%)	5 (10%)
4	50	2 (4%)	0 (0%)
5	50	2 (4%)	0 (0%)
6	50	0 (0%)	0 (0%)
7	50	0 (0%)	0 (0%)

The above result showed that bud-take success ranged between 4 and 40%, while sprouting percentage ranged between 6 and 10% for the 2-3 month rootstock categories. The similarity in the results of year 2000 and 2001 is indicates that the rootstock of this age group is likely to give a better result when the technique is finally perfected. The reduction in the sprouting percentage needs attention. Wounding of the scion and use of plant hormones or biostimulants might help in this regard. It is equally important to mention here that some sprouted plants (clones) were found dying back at 3-4 leaf stage after sprouting. Sterilization of bud woods and budding equipment with prevention of contamination through the soil from the poly bags during budding exercise shall go a long way to resolve this die-back problem.

Grafting: Table 2 shows the success rate recorded in the grafting trial

Table 2: Cashew Grafting Trial

Age of Rootstock	**Number Grafted**		**No. of Graft Take**		**No. of** Sprouted Grafts		**No. of Green Grafts**	
	C	**O**	**C**	**O**	**C**	**O**	**C**	**O**
2	25	25	4(16%)	0	1(4%)	0	0	0
3	25	25	10(40%)	1(4%)	2(8%)	0	2(8%)	0
4	25	25	7(28%)	1(4%)	1(4%)	0	0	0
5	25	25	1(4%)	0	0	0	0	0
6	25	25	0	0	0	0	0	0
7	25	25	1(4%)	0	0	0	0	0

C: Grafted rootstocks covered with polythene,
O: Grafted rootstocks left opened

The results obtained in this grafting trial showed similar trend with that of budding as little success recorded was in 2-4 month old rootstock group. The effect of covering the grafted materials with polythene sheet was found significant in this study. It is however clear that budding and grafting in cashew is possible, more commitment is needed to perfect these techniques towards mass production of planting materials regetatively.

Constraints: Non-availability of trained budder/grafter and non-release of funds for procurement of research materials.

Recommendation: The results of the trial are promising. There is need to improve on it.

Title: Clonal propagation of Superior Cashew Materials by Cuttings (L.A. Hammed)

Objective: To investigate the effects of growth media and the thickness/girth on the rooting of cashew cuttings.

Methodology: The cuttings were prepared from 16 month old cashew saplings (Overgrown of seedlings). The Characteristics of the cuttings are as presented on Table 1. However the cuttings were all leafless. The three growth media used includes top-soil , sawdust and 1:1 mixture of top-soil and sawdust. The cuttings, 20cm long were treated with 5mg/1 of NAA. Besides, the media too were saturated with the solution before setting the cuttings. Watering was twice a week and continued for two weeks and no shade was provided because of the nursery shade of *Gliricidia spp*. 48 cuttings were set per growth medium. Sprouting counts were taken 2 and 4 weeks after setting (WAS). Sprouting and rooting percentages were computed at 4 WAS and 8 WAS respectively (Table 1). The latter was in accordance with the works of Ohler (1979) in which case cutting that sprouted but rooted 7WAS are expected to wither.

Result: It is shown on Table 2 that cashew cutting of girth of 1.30 – 2.00 cm with mean girth of 1.56cm gave the highest sprouting percentage of 22.22% irrespective of the growth medium. This range of girth constitutes the basal portion of cashew saplings.

The sprouting percentage decreases with decrease in sapling girth towards the apex (Tables 1 & 2).

All the sprouted cuttings that survived 8 WAS are assumed rooted (Ohler 1979). Therefore, cuttings with girth 0.8 – 1.20 cm rooted best with 10.55% rooting percentage (Table 2.). On Table 3, the mixture of topsoil and sawdust gave the highest sprouting percentage of 75.00% and rooting percentage of 37.50% while the top soil gave the least sprouting and rooting percentages.

The presence of a few carbohydrates might have aided the sprouting of cuttings observed 4WAS. The exhaustion of these carbohydrates might have contributed immensely to the withering of the young sprouts (8WAS) because some of the sprouts might not yet be able to photosynthesise.

The experiment will continue in 2002

Table 1: Characteristics of the cashew cuttings

Girth Class	Girth (cm) Min.	Girth(cm) Max.	Mean	S.E	C.V(%)	n	Length(cm)	Colour
A	1.30	2.00	1.56	± 0.07	16.46	12	20	Brown
B	0.80	1.20	0.99	±0.03	12.40	12	20	Brown
C	0.06	0.85	0.74	±0.02	11.39	12	20	Brownish
D	0.50	0.62	0.55	±0.01	8.25	12	20	Green

Min: Minimum, Max: Maximum, S.E: Standard error, C.V: Coefficient of variation, n : Size of sample.

Table 2: Percent sprouting of cashew cuttings as affected by the cutting girth (n=60)

Girth Class	4WAP	8WAP	12WAP
A	22.22	7.78	2.78
B	13.33	10.55	2.22
C	10.55	0.00	0.00
D	5.00	0.00	0.00

Effects of floatation test on germination rates of cashew nuts (E.A. Adeyem and L.A. Hammed)

Objective:(i) To validate floatation test as a means of viability testing.
(ii) To study the germination of cashew nuts (floaters and sinkers) as affected by the floatation test.

Methodology: The experiment was conducted twice in the year. The first trial of 286 cashew nuts of Iwo selections were collected from zone 1 cashew plantation and soaked in tap-water, after spending three months on the laboratory shelves. Twenty-four hours after soaking, 108 and 178 nuts were found to float and sink respectively. These were collected and sown separately in the poly bags containing top-soil.

In the second trial, 30 sinkers and floated nuts each were tried. However, the nuts were sown with stalk end up at a depth of about 5cm above the soil surface. Germination percentages were computed 3 and 4 weeks after sowing (WAS).

Result:
Table 1

Period of record	Floatation in water	Percent Germination 1st trial	2nd trial
3 WAS	Sinkers	-	93.00ns
"	Floaters	-	90.00ns
4 WAS	Sinkers	99.00ns	96.67ns
"	Floaters	86.00ns	90.00ns

The study showed that the germination of floaters was as good as that of sinkers. Thus, the practice of discarding floaters should be discouraged in order to prevent wastage of a large quantity of cashew nuts that are viable for sowing.

The finding from the trial has led to the need to conduct research into a reliable method of testing viability of cashew nuts.

The seedlings were transplanted to the field for comparative field performance.

Further selection of superior/improved cashew materials for the establishment of seed garden (L.A. Hammed)

Task: Effects of nut-size, spacing and planting methods on early field establishment of cashew in Nigeria.

Objectives: (1) To investigate the effect of nut-size on early field establishment of cashew .

(2) To monitor early field establishment of cashew as affected by the methods of planting.

(3) To increase production per plot of cashew through high density planting

Methodology: The cashew nut-sizes (Jumbo, medium, madras) and planting methods (in-situ, potted seedling, naked root seedling) were combined in a factorial experiment laid out in randomized complete block design with three replications.The jumbo nuts (16 gm), medium (4g-8g) and madras (<2g) were collected from Koshoni-ola farms, CRIN headquarters and CRIN Ochaja substation respectively in 2001 fruiting season. The sowing was done between

August and September 2001 because of the unusual normal precipitation of the year. The naked-root seedlings were dipped in a synthetic polymer (alcosob-400) inside a plastic bucket and carried to the field for transplanting. The planting operations (in-situ and nursery) took place same day. For high density planting trials on cashew, three planting densities were investigated upon. These were 277, 483 and 1,111 plants per hectare. The experiments are in progress.

Locations: CRIN Headquarters (rainforest) and Ochaja substation (Guinea savanna).

Ecology of the Cashew leaf miner *Acrocercops Synagramm* **(**Meyricki**)**
(*Lepidoptera: Lithocolletidae)(*.Okelana, F.A.)

Objective: To monitor the occurrence of the Cashew leaf miner *A.synagramma* on cashew at CRIN Headquarters.

Methodology: Twenty stands of cashew at each of two locations viz: around the office complex

and nearby North Plot at CRIN Headquarters were selected randomly, every week, making a total of 40 stands. Four branches at hand height were chosen per tree and the number of leaves with active (fresh) mines of the pest were counted and recorded. Total and mean weekly values of mines per month were computed.

Results:The miner occurred in eleven out of the twelve months of the year at the stands around the office complex being absent in April; while it occurred in every month on those at the North Plot. Peak population of the pest occurred in both areas in November with that of the office complex being higher than at the North Plot followed by August, December and October at both locations (Table 1). Lowest population was recorded on the Office Complex stands in April and at the North plot in March (Table 1). As was observed in 2000, tender cashew leaves were more susceptible to the miners' attack than the old leaves.

Table 1: 2001 Incidence of the Cashew leaf miner *A. synagramma* **on cashew at two locations at CRIN Headquarters, Ibadan.**

	Mean weekly Number of leaves with fresh mines	
	Experimental Locations	
Months	Office Complex	North Plot
January	14.8	12.0
February	16.8	14.0
March	1.3	0.8
April	0.0	1.0
May	2.0	1.2
June	8.5	7.5
July	25.0	18.0
August	51.8	33.0
September	22.3	21.8
October	32.0	25.5
November	55.5	48.5
December	45.0	27.5

Identification of insects associated with the young plantation of the Brazilian cashew genotype ('Oro' selection) at CRIN Headquarters.(Okelana, F.Mrs)

Objectives: To collect and identify the insects associated with young establishment of the Brazilian cashew genotype ('Oro' selection) and determine the status of the insects.

Methodology: On weekly basis, 20 stands of the ('Oro' Selection) of Brazilian cashew established in the Southern zone of CRIN Headquarters in Ibadan were sampled and all insects associated with the stands were collected and identified.

The level of damage/activity of each insect species was also observed.

Results: Insects recorded were:
(1) Hymenopter***a***: Various species (unidentified)
(2) *Coleoptera:* Beetles notably *Parapoderus fuscicernia*, (the red beetle), *Cheilomenes lima*ta (F)., *Lagria* sp. and *Barombia humeralis* in order of importance
(3) *Orthoptera*: Nymphs of *Zonocerus variegatus* the variegated grasshopper.
(4) *Lepidoptera:* The cashew leaf miner *Acrocercops synagramm*a and *Euproctis fasciata*, the cashew leaf roller.
(5) *Hemiptera*: Pentamomid bug (unidentified)
(6) *Homoptera*: mealybugs (unidentified)

Conclusion: The red beetle *P fuscicernia* and the leaf miner *A.synagramma* were predominant and caused considerable damage to the young cashew leaves.

Title: Effect of soil sterilization, phosphorus types and mycorrhizal inoculation on early + growth of Cashew(Ibiremo, O.S)

Objective: To evaluate the influence of phosphorus fertilizers from different sources, soil sterilization and mycorrhizal inoculation on early growth of cashew.

Methodology: Soil samples were collected at CRIN headquarters (Alfisol) at 0-20cm depth. They were air-dried in the open laboratory and sieved through 2mm sieve. Five kilogrammes of soil were measured into 5-litre plastic buckets.

The treatment combinations comprising two levels of soil treatments (S_o x S_1), three sources (P_o + P_1 = Single Super Phosphate (SSP) and P_2 = Sokoto Rock Phosphate (SRP) of phosphorus fertilizers (P_o, P_1 & P_2) and two levels of VA-mycorrhizal inoculations (M^- & M^+). The twelve treatment combinations were randomly arranged in a completely randomised design with three replications. A month after planting, the treatments were applied. Growth parameters of plant height, stem diameter, number of leaves per plant, and leaf area were regularly taken. Watering was done every other day.

Prior to commencement of the experiments, the initial physical and chemical properties of the soils were determined.

Results: The initial physical and chemical properties of the soil used for the experiments are presented in Table 1. The soil was moderately fertile especially with respect to the macronutrient content.

Table 1: Pre-cropping physical and chemical characteristics of the soil used for the experiment.

Soil depth 0-15cm	**Unit**	**Value**
Sand	g/kgsoil	694.00
Silt	g/kgsoil	149.60
Clay	g/kgsoil	156.40
Textural class	Sandy loam	

pH (H_2O)		6.65
Organic carbon	g/kg	9.10
Total Nitrogen	g/kg	8.10
Available P	mg/kg	8.76
Exch. cations	Cmol/kg soil	
K	Cmol/kg soil	0.40
Ca	Cmol/kg soil	2.96
Mg	Cmol/kg soil	1.28

.

Table 2 shows the effect of soil sterilization, phosphate types and mycorrhizal inoculation on the height and stem diameter of cashew seedlings. The results indicated that P-sources significantly affected the height of cashew at 3 and 5MAP and stem diameter. SSP improved the height of cashew seedlings than SRP in an alfisol.

However, the effect was not so apparent on the stem diameter of cashew seedlings. Further observation will confirm the results in the coming yea.

Table 2: Response of cashew seedlings to soil sterilization, phosphorus fertilizers and mycorrhizal Inoculation in an Alfisol.

Treatment	**Plant height (cm)**		**Stem Diameter (cm)**	
	3 MAP	**5 MAP**	**3 MAP**	**5 MAP**

P_0 S_0M^-	24.10	33.00	0.89	1.23
P_0 S_1M^-	19.17	31.83	0.90	1.20
P_1 S_0M^-	23.40	28.33	1.03	1.37
P_1 S_1M^-	31.50	36.67	0.93	1.43
P_2 S_0M^-	14.47	27.83	0.86	1.47
P_2 S_1M^-	24.63	31.50	0.88	1.14
P_0 S_oM^+	20.82	31.67	0.83	1.15
P_0 S_1M^+	25.47	32.00	0.94	1.33
P_1 S_0M^+	25.67	27.67	0.97	1.25
P_1 S_1M^+	13.53	31.77	0.94	1.35
P_2 S_0M^+	9.87	27.83	0.83	1.11
P_2 S_1M^+	14.97	22.50	0.83	1.16
Mean	14.41	30.22	0.90	1.27
S.E	1.29	1.04	0.02	0.03

P_0 = Nil P_20_5/ha, P_1 = 30kg P_20_5/ha P_2 = 30kg P_20_5/ha M^+ = with mycorrhizal inoculation M^- = without mycorrhizal inoculation S_0=without soil sterilization S_1=with soil sterilization MAP = months after planting

Title*:* **Economic Losses *in* Cashew** – *(* Shittu T. R.)

Introduction: Available evidence shows that opportunities exist within the country for the farmers to increase their income through appropriate increase is cashew nut production *cum* apple processing by way of diversification in form of adding value. Increased local consumption through appropriate promotion effort could bring in enormous revenue when sold locally. Also world price would be enhanced. However, a lot of factors determine the yield obtainable from a cultivated cashew farm. These include pests, diseases, apple malformation among controllable factors and the non-controllable factors.

This work looked into the proportion that each of these agents, contributed to the loss of the additional revenue by cashew farmers and their potential output before and after harvesting. This was to be able to predict possible loss due to neglect or refusal to control one or more of these agents of deterioration due to untimely harvest of the ripe apples.

Methodology: A total of 40 cashew trees were randomly selected from Onigambari experimental plot in a study that stretched over 10 weeks. Records of apples that were whole, diseased, pests infested, pests and diseases complex were taken on every other day. These variables were the focus of attention as combination of all these greatly accounted for the total number of apples/nuts produced per tree/ha.. These variables affect the revenue generating potentials of the cashew farmers in particular, healthy living conditions of the society and the foreign exchange earning capacity of the country as a whole.

Assumption: We assumed that all necessary cultural operations needed have been done thus cost of production were not determined.

Results and Discussion: An assessment of the specific and joint effects of the agents of degradation or deterioration on the cashew trees as well as on farmers' income showed a wide variation between the realisable income and accruable income. The result showed that a total of ₦18, 483 could have been generated from cashew that were timely harvested while that from conventional method was ₦232.50 thus implying that the sum of ₦18, 250.50 was lost to those agents giving a 98.74% loss caused by them. However, specific contributions of each of these agents to the loss were summarised in the Table below:

Agents of destruction	% Contribution	Naira Equivalent	CV	Std CV
Malformed apples	2.05	373.50	98.71	0.6876
Pest infected apples	8.24	1,504.50	99.10	0.6922
Diseased apples	7.91	1.44.3	98.97	0.6876
Pests & disease complex	81.69	14,908.80	97.9	0.6834

The result implies that we are at least 68% confident that any of these agents of destruction are capable of reducing the farmers' income by the quoted amount if fruits are not harvested as at when due but are allowed to drop before they are picked.

TEA PROGRAMME (Leader: Ojelade, K.T.M)

Theme 1: Improvement in the establishment and productivity of highland tea in the Mambilla Plateau Area of Nigeria.

Task 1.1: Determination of optimum organic fertilizer regime for highland tea production.

Title : Evaluation of different organic materials and inorganic fertilizers on tea in highland and lowland ecological areas. (Ipinmoroti R.R. And C.R. Obatolu)

Activity : To determine the agronomic potential or organic and inorganic fertilizer materials on tea growth performance.

Objectives : To know the effect of types and rate of fertilizers on young tea seedlings at different ecological areas.

Justification : There is high cost of procuring inorganic fertilizers, which the local farmers could not meet. Therefore, the need to look inwards, for the use of farm wastes and bio-products as a substitute for nutrient supply to tea farms can not de de-emphasised.

Methodology : To compare the performance of tea seedlings using organic and inorganic fertilizers under different ecological areas. Readily available farm wastes such as cocoa pod husk, cow-dung, poultry droppings, Siam weed tea fluff and area were applied at the rates of 0, 75, 150 and 300kg N/ha, and applied rates. The treatments at four replicates in far blocks were set up using plastic buckets of 10-litre size. Tea seedlings were planted and water applied regularly to field capacity. Data on plant height, stem girth, number of leaves leaf area and number of branches were taken on monthly basis. The experiment was replicate at Kusuku an Ibadan.

Result : The experiment is on-going, but data collected so far indicated a positive need for the use of the various organic fertilizer materials for nutrient supply to the test crop. (tea)

Recommendation : Tentatively, it may be advised to make use of the various organic materials as used in this study, as fertilizer nutrient supply on their farms.

Theme 1: Improvement in the establishment and productivity of highland tea in the Mambilla Plateau area of Nigeria.

Task 1.2: Utilization, processing and quality assessment of highland tea.

Title : Tea leaf Nutrient contents for commercial tea clone selection **(**Obatolu, C.R , Ipinmoroti, R.R)

Activity : Determination of tea leaf nutrient contents

Objective : To select more tea clones for commercial tea cultivation

Justification : There is dire need to increase the few available commercial tea clones with other clones that could rank favourably with them both in chemical composition and environmental adaptations.

Methodology: Chemical analysis of the ‘‘two leaves and a bud’’ (flush) of the 23 tea clones available at the tea gene pool of CRIN substation at Kusuku were determined. Results were used in ranking the tea clones, for their possible consideration for commercial cultivation. The

expected output and nutrient compositions of the various tea clones were used to calculate the amount of nutrient needs of the favourably considered tea clones on the field.

Results: The chemical analysis results obtained showed that the various tea clones differ in their composition for the various nutrient elements (Table 1). Result obtained from the application of multidimensional statistical analysis, shows that tea clones 354, 359, 228, 19,08,363 and 61 were either found to be superior or ranked favorably with clone 236 (reference clone) and the conventional commercial tea clones 68,143, 318 and 35. In determining nutrient composition of tea clones, macro-nutrient components gave a better ranking parameter than the use of micro-nutrients or the use of both. (Table 2) Also, the fertilizer needs for the favourably ranked tea clones will be better based on the amount of nutrient removal given in Table 3. from the result obtained, the total number of possible commercial tea clones may be increased from 5 to 12 to clones.

Recommendation: Tea clones 354, 359, 228, 19, 108, 363 and 61 have been favourably ranked to be included amongst the commercial tea clones. Their nutrient needs may be based on the expected loss which may result from the harvest from time to time.

Table 1 **Nutrient composition of various tea clones at crin gene pool ranked based on Multidimensional statistical analysis**

		← % →					← mg/kg →		
Tea clone	**N**	**K**	**Ca**	**Mg**	**P**	**Cu**	**Zu**	**Mn**	**Fe**
19	3.3	1.2	0.34	0.31	0.25	18.0	30.0	298.0	148.0
61	2.42	0.88	0.38	0.37	0.25	15.0	35.0	400.0	133.0
68*	3.93	1.43	0.28	0.27	0.31	20.0	55.0	225.0	133.0
74	3.33	1.21	0.24	0.23	0.23	28.0	43.0	328.0	175.0
143*	3.69	1.34	0.30	0.28	0.28	18.0	45.0	400.0	115.0
228	2.86	1.04	0.50	0.42	0.28	13.0	48.0	425.0	140.0
235	2.67	0.97	0.29	0.27	0.25	35.0	30.0	305.0	180.0
318*	3.74	1.36	0.36	0.30	0.25	18.0	48.0	213.0	120.0

353	3.27	1.19	0.25	0.23	0.26	15.0	55.0	450.0	113.0
354	3.44	1.25	0.42	0.30	0.30	18.0	58.0	218.0	160.0
359	3.91	1.42	0.42	0.25	0.33	20.0	57.0	425.0	155.0
363	2.83	1.03	0.39	0.30	0.25	15.0	33.0	283.0	153.0
367	2.97	1.07	0.16	0.04	0.25	25.0	50.0	215.0	163.0
368	2.50	0.91	0.14	0.04	0.34	28.0	28.0	400.0	125.0
369	2.59	0.94	0.24	0.27	0.25	28.0	55	275.0	143.0
370	3.27	1.19	0.36	0.23	0.26	10.0	20.0	388.0	133.0
unknown	2.78	1.01	0.25	0.27	0.25	18.0	68.0	305.0	120.0
14	3.03	1.10	0.12	0.13	0.32	15.0	37.0	605.0	150.0
25	5.61	2.04	0.18	0.12	0.29	15.0	28.0	755.0	150.0
35*	8.77	3.19	0.06	0.15	0.38	15.0	52.2	355.0	550.0
108	6.82	2.48	0.30	0.15	0.31	10.0	36.0	350.0	150.0
236**	4.54	1.65	0.31	0.27	0.28	15.0	54.0	4.25	150.0
357	4.16	1.49	0.11	0.17	0.35	15.0	43.0	620.0	150.0

*** Commercial clones** **** Reference clone (Best flavored)**

Table 2: Ranked tea clones based on multi dimensional Analysis of their nutrient composition.

Tea clone	Ranking based on macro- nutrient contents	Ranking based on micro- nutrient contents	Ranking based on Total nutrient composition
19	8	14	10
61	11	13	13
68	6	20	11
74	18	2	9
143	7	14	8
228	3	19	4
235	17	14	15
318	5	23	17

353	16	18	17
354	1	12	3
359	2	1	1
363	10	14	12
367	23	9	23
368	22	8	21
369	21	10	19
370	13	22	19
Unknown	18	10	22
14	20	5	16
25	15	3	7
35	11	6	5
108	9	21	13
236	4	7	2
357	14	4	

Table 3: Nutrient removal level by tea clone under assumed average field of 1500kg/ha made tea

	Tea clone	**N(kg)**	**P (kg)**	**K (kg)**
	354	51.60	4.50	18.75
	359	58.65	4.95	21.30
	228	42.90	4.20	15.60
	19	49.50	3.75	18.60
	108	102.30	4.65	37.20
	363	42.45	3.75	15.45
	61	36.30	3.75	13.20
	236	68.10	4.20	24.75
	318	56.10	3.75	20.40
	68	58.95	4.65	21.45
	143	55.35	4.20	20.10

35	131.55	5.70	47.85

Theme 1: Improvement in the establishment and productivity of highland tea in the Mambilla Plateau Area of Nigeria

Task 1.3: Determination of optimum organic fertilizer regime for highlandteaproduction.

Title : Effects of organic and inorganic fertilizer on tea growth at Kusuku Mambilla Plateau. **(**C.R. Obatolu And R.R. Ipinmoroti)

Activity : To determine the effects of organic and N.P.K fertilizers on tea in the field.

Objectives : To investigate the separate and combined use of organic and inorganic fertilizers for tea growth.

Justification : The high cost of procuring inorganic fertilizers is making the commodity to be unaffordable to the peasant farmers. Thus, there is need to source for cheap and readily available alternative materials for nutrient supply to tea farms.

Methodology : Seven fertilizer treatments including: (a) Control (b) 300kg Urea/ha (c) 10 tons/ha cowdung (d) 150kg Urea +5 tons/ha cow-dung (e) 150kg Urea/ha (f) 5 tons/ha cowdung and (g) 75 kg urea+ 2.5 tons/ha cow-dung were assessed in the experiments conducted on the field. A randomized complete block design (RCBD) with 3 replicates and 3 blocks of 10 tea stands per treatment per block was utilized. Data on the agronomic parameters of plant height, stem girth, total number of leaves and leaf area were collected for 12 months.
Results : Statistical analysis indicated that the tea plants under fertilizer treatments gave better values that were significant at P = 0.05 over the control. The values were 1.8 –26.16 cm; 0.4-1.71cm, 9-58 and 9.9-23.36cm^2 compared with the control for plant height, girth, number of leaves and leaf area, respectively (Table 1). Organic and inorganic fertilizer mixtures at 75kg urea + 2.5tons cow-dung/ha gave the best performance of tea. This suggests the need for the use of organic and inorganic fertilizer mixture for better tea performance on the filed.

Recommendation : Cowdung in combination with urea at 75kg urea + 2.5 tons cow-dung/ha is gave a promising result for improved yield of tea production on the field.

Table 1 Growth parameters of tea plants as affected by fertilizer treatments.

Treatment	**Height (cm)**	**girth (cm)**	**Number of leaves**	**Leaf Area (cm2)**
300kg urea/ha	13	1.19	23	22.4
10 tons/ha cowdung	7.4	1.32	19	10.16

150kg urea + 5 tons cowdung	10.8	1.14	40	13.42
150kg urea/ha	26.16	1.71	28	21.7
5tons cowdung/ha	1.96	0.60	12	12.1
75kg urea + 2.5 tons cowdung/ha	11.2	1.27	58	23.36
Control (No fertilizer)	1.8	0.40	9	9.9
LSD (0.05)	5.41	0.34	5.25	4.5

Theme 2: Production of tea in lowland areas of Nigeria

Task 2.1: Continuation of adaptation studies on establishment, yield and quality in lowland tea.

Title : Determination of critical nutrient need for tea under tea/rubber intercrop.(Ipinmoroti, R.R, E.B. Esan and A.A. Oloyede)

Activity : To determine the critical nutrient need of tea plants on the field.

Objective : To determine the most critical nutrient elements for tea plants under tea/Rubber intercrop.

Methodology : In order to determine the critical nutrient need for tea under tea/rubber Intercropping system, soil and leaf samples were collected at the tea/rubber intercrop plot at Akwete. The 4^{th} leaf (indicator leaf) was collected for each tea stand, while the soil samples were collected at 0.30cm soil depth. The leaf samples were oven-dried at 70^{o}C to constant weight, and milled with the hammer mill the laboratory. The soil samples were air dried on wooden slabs in the laboratory and sieved with 2mm sieve. Due to logistics, the chemical analysis of the samples is yet to be carried out.

Results : Observation on the tea plants under the rubber inter-rows revealed better performance than the tea sole (tea in the open). Clones 143 and 318 showed superiority in growth than clone 35. On the overall, the performance of tea at Akwete could be said to be poor when compared with tea established at Ikom, Kusuku and Malyo-Salbe.

Hence, Akwete site could be classified as a marginally suitable area for tea and would require some level of fertilization for optimal performance. The results from the analysis of the soils and tea leaves would assists in determining the critical elements for tea plants.

Recommendation: Tea plots would need to be assessed from time to time through chemical analysis of the soils and tea leaves for determination of critical nutrient elements required on the field for good tea production.

Theme 2 : Production of tea in lowland area of Nigeria
Task 2.2: Continuation of adaptability studies on establishment, yield and quality in Iyanomo, Akwete, Ikorodu, Araromi-Obu, Ijebu-Ife, Mayo-selbe, Ajassor, and Ibadan.

Title : Production of tea in the lowland areas of Nigeria. **(**Daniel, M.A & C.R Obatolu).

Activity: Evaluating nutrient availability to plant in the lowland areas through soil and foliar test.

Objectives: To evaluate nutrient availability in lowland tea growing areas of Akwete and Iyanomo. Assess soil and plant samples on nutrient status and agronomic parameters.

Justification: Tea adaptability trials in the lowland areas of Nigeria have been on-going for the past decade with the sole aim of establishing adaptable commercial clones in these areas. The suitability of these areas in connection with nutrient availability to the plants for sustenance needs to be sequentially assessed. This is because tea plant is known to be a shallow root feeder in which has heavy demand on essential nutrients.

Methodology: Soil and foliar samples of three tea clones were collected from two lowland areas of Nigeria, Iyanomo, Edo State and Akwete, Abia State, and were evaluated in the year under review. Composite soil samples were collected at 0-45cm depth in each trial plot/location and bulked. The bulked samples were air-dried, crushed and sieved to pass through 2mm sieve and analyzed for the following:
pH in 1:25 soil- water ratio using glass electrode pH meter; Total N, Kjeldhal method (Bremner, 1965); organic carbon titration (Walkley and Black, 1934); Available P by Bray-1 method (Bray and Kurtz, 1945); Exchangeable cations including K, Mg and Ca were read on atomic absorption spectrometer using the appropriate filter. After leaching the samples with NH_4OAC.

Leaf samples (fourth leaf from fully opened leaves at the tips of primary branches) were collected. The leaf samples were placed inside sampling envelopes and prepared for analysis as outlined by the Association of analytical chemist (A.O.A.C, 1970). The samples were washed in distilled water, enveloped and oven-dried at 65^0C for 48hrs and then ground in a wiley micro-hammer stainless steel mill using a 1mm sieve.

Calorimetric determination of total N(mg/kg) on a Technion auto-analyzer, P was determined using vanado-molybdate method. The concentration of K, Mg and Ca were read on atomic spectrometer after digesting the samples.

Results : Soils of Iyanomo were classified as ultisol according to U.S.D.A soil classification legend (1990). From the results obtained, the physico chemical properties of the soil were determined. The soil pH in the two locations ranged from 4.40-6.20 Organic carbon, 11.0-16.0g/kg, available P, 20.0 – 48.00mg/kg and exchangeable cations, 0.01-0.14 for K, 0.28-0.82 for Ca and 0.38-0.45cMol/kg soil. The results obtained from the two locations may be rated as line between low and moderate for tea. (Table 1).

The Agronomic parameters taken revealed percentage increase from the three clones (table 2). At Iyanomo plant height decreased from 43.1-27.71%, 40-26% number of leaf; 35.71 –30.95% leaf area and 38.88, 33.33% plant girth for clones 35, 318 and 143. Similar trend were recorded at Akwete, which gave 35.55-31.11% plant height, 35.82-31.34% number of leaf, 34.66%-32.66%-32.0% leaf area and 40.0-26.66% for plant girth on clones 25,143 and 318 respectively. The leaf nutrient composition were found to vary from low, moderate and slightly above critical levels (Table 3) in the two locations. The low leaf nutrient contact obtained in both locations for the three clones may be attributed to the low level of N in the soil. And, Significant differences observed in the agronomic parameters in the three tea clones may be related due to the environmental factors and the soil reaction influence on the nutrient availability.

Recommendation : The significant difference in the tea clones were not due chance but as a result of the influence of soil nutrient availability as predetermine the prevailing climatic condition and soil reactions which plays a major role in the availability of basic cations for plant growth.

Therefore, for commercial tea production of these most adaptable tea clones, better soil amelioration through use of organic fertilizers may be essential.

Table 1 : Physical and chemical properties of soils of Iyanomo & Akwete.

Location:	pH(H_20)	Org.C g/kg	Total N% mg/kg	Avail P mg/kg	Exchangeable cations (Cmol/kg)		
					K	Ca	Mg
Iyanomo	6.20	11.0	0.16	20.00	0.41	0.82	0.38
Akwete	4.40	16.6	0.10	48.00	0.10	0.28	0.45
Critical level		10.5	0.09	2.6-3	1.5-1.8	0.5-0.7	0.2

Table 2: Agronomic parameters of lowland Tea clones in Iyanomo and Akwete
(% change in relation to Clone 351, 318 and 143)

Locations	Tea clones	Plant height (cm)	Number of leaf	leaf area (cm2)	Plant girth (mm) (%)
Iyanomo	318	29.20	34.0	34.05	28.67
	35	43.10	40.0	35.0	38.0
	143	27.71	26.0	30..95	33..33
Akwete	318	31.11	31.34	32.68	26.66
	35	35..55	35.82	34.66	33.34
	143	33..34	32.81	32.66	40.00
	S.E	36..2	32..9	9.89	9.6

S.E = Standard error.

The leaf nutrient composition per clones was found to be as presented in table 3.

Table 3: Leaf Nutrient composition of tea clones in Iyanomo & Akwete

Location:	Tea clones	N %	P%	K%	Ca%	Mg%
Iyanomo	318	3.75	0.25	1.35	0.35	0.29
	35	8.74	0.37	3.20	0.16	0.20
	143	3.69	0.30	1.33	0.23	0.21
Akweate	318	2.85	0.28	0.15	0.62	0.17
	35	2.65	0.28	0.25	0.42	0.20
	143	2.83	0.30	0.59	0.19	0.13
	SE	2.1	0.1	0.1	0.1	0.1
Critical level		4.5 –5.0	0.3-0.4	1.5-2.0	0.5-0.7	0.2

S.E = Standard Error.

Theme : Improvement in the establishment and productivity of highland tea in the Mambilla Plateau area of Nigeria

Task : Development and evaluation of more superior tea clones for yield, early table formation, resistance to drought, pests and disease, low inputs in terms of fertility and pesticides. **(**Ojelade. K.T.M)

Objective : The objective of this experiment is to evaluate the susceptibility/tolerance status of available tea clones in the germplasm in Mambilla, Taraba State.

Justification : The study will enhance appropriate documentation on insect pests' occurrence and damage in relation to the different tea clones available in the germplasm.

Methodology : Twenty-six (26) clones of Tea in the germplasm pool on the Mambilla were evaluated for their tolerance/susceptibility to insect pests occurrence and damage A three(3) point scales of (i.) 0 -10%, (ii)11-25% and (iii)26% upwards, were used in scoring for the level of damage observed in most leaf-defoliation. Hence the tea clones were categorized into (i.) Clean clones(non susceptible), (ii) Low and (iii) High Susceptible clones.

Results: From the analysis of the scores, only clone 228, was observed to be tolerant to insect pests, while 12 clones fell within the low susceptible category. In addition to the commercial clone (clone 35) and the ''unknown'' clone, eight other clones were recorded as highly susceptible clones.(Table 1)

Location: Kusuku, Mambilla Plateau.

Table 1: Categorization of 26 tea clones in CRIN germplasm, at Kusuku Mambilla for susceptibility/tolerance status.

Level of Susceptibility	Number of clones	Identity of clone
Clean Clone	1	228
Low Susceptible	12	19,74,368,357,14,25,108, 363,114, 379,100 and 318.
Highly Susceptible	11	unknown, 367,354,33,353,143, 238,35(commercial clone) 237 and 236.

STATISTICS SOCIO-ECONOMICS AND TECHNO-ECONOMICS STUDIES (Leader: O. O. Oduwole)
Theme: Socio- Economic Evaluation of Farm and Farmers Productivity *(*Sanusi, R. A**)**

Task: Analysis of Coffee Trade in Selected Coffee Growing Areas of Nigeria.

Background: Marketing is known to be vital to the economy of all countries of the world since it performs some fundamental functions. For a market to serve its importance in an economy, it must be an efficient market. Although, definitions and explanations of marketing efficiency varies, a concise definition of the term could be said to be the movement of (agricultural) produce from the producers to the users at the lowest cost consistent with the provision of the services desired by the users. The marketing of coffee, most especially, has been known to be seriously hampered over the years mostly due to low prices being offered to farmers. Hence, an investigation was carried out to ascertain the determinants of coffee marketing in Nigeria (during coffee seasons) from November 2000 to December 2001. Part of the preliminary findings necessitated this study. Some coffee exporters and merchants (in large towns such as Ibadan) were interviewed during the preliminary investigation. These traders revealed that poor bean quality and scattered sale point with small quantities of beans available for sale were the major constraints facing the Nigeria coffee trade.

Objective: This study was conducted to examine the coffee trade channel with special reference to the activities of traders within the coffee growing regions.

Methodology: Eighty (80) traders were randomly selected and interviewed in the coffee growing states of Kogi and Taraba. The interview schedule consisted of personal visits with the use of well-structured questionnaires. The data generated was analyzed using coefficient of variation and descriptive statistics such as frequencies and percentages.

Results and Discussion: It was found out that more than one class of middlemen is involved in coffee trade in Nigeria. Hence, without proper organization, the efficiency of the Nigerian coffee

market could be quite low. This could have unfavorable effect on quantity sold and selling price and it could be responsible for the high variability of these factors (Table 2).
A great proportion of traders were of the opinion that the constraints facing coffee trade (and by extension the coffee industry) is low bean prices (Table 1). From the above, it can be deduced that market instability with particular reference to bean price is the most crucial problem of coffee trade. To tackle the problem(s), Majority of the traders recommended the introduction of (coffee) trade regulations and control by government to be administered by government or coffee union as well as government's re-invention of the commodity Board (Table 1).

Varying purchase locations as well as sources of purchase could be said to affect the purchase price and quantity bought adversely. In actual fact, the variability index of 0.25 and 0.63 are indications of high purchase price and purchase quantity instability (Table 2).
Produce grading was found to be carried out by quite a number of graders such as the farmers themselves, government (produce inspection) officers, brokers. This practice (of grading coffee) could be responsible for the low bean quantity complaints against coffee beans in Nigeria by the city merchants and exporters. Furthermore, there is possibility of bias in classifying coffee into grades as a result of the person who is grading the produce. Hence, selling price, purchase price, quantity purchased and sold may be influenced by grade classification of the grader. This practice could be said to be another factor responsible for the high instability exhibited by the four variables mentioned above (Table 2).

At a purchase price of ₦54,982.10 per ton, (an average) 34.84 tons of coffee was bought for sale by (an average) coffee trader (Table 2). At (an average) selling price of ₦66,887.0 per ton, (an average) 23.38 tons of coffee was sold (Table 2). This implies that (on the average) 1.15 tons of coffee could not be sold traders. The above yielded a (negative average) gross margin of. ₦33,291.57 (Table 3).

Conclusion and Recommendations: From the results obtained, the type of buyer that buys traders' produce had impact on the quantity sold and selling price. Also, quantity purchased can be said to influence the purchase point. This cannot be divorced from the influence of purchase source on purchase price and purchase point on purchase price.

The coffee trade could be said to be technically and economically inefficient. The defects in offering low quality beans for sale as a result of improper grading, which were reflected in the influence of buyer type on quantity sold, selling price and grade; implies technical inefficiency. The trade is also economically inefficient due to the negative gross margin obtained and a relatively high variability index for prices (Tables 2 and 3).
To reduce these inefficiencies and ultimately eliminate them, the role players in the coffee trade chain need be educated/enlightened on proper and adequate produce quality characteristics for better grade ratings. Also, there is need to change the method of (on-farm) post-harvest processing from dried beans to wet beans to meet global standard. The Cocoa Research of Institute Nigeria (CRIN) has a leading role to play towards achieving these goals. Finally, there is need for trade regulation and control by a government parastatal (e.g. the Ministry of Trade and Commerce) in conjunction with the National Coffee and Tea Association (NACOFTAN) and CRIN.

Table 1: **Factors of Coffee Trade in Coffee Growing Areas of Nigeria**

Factor	Frequency	Percentage
Constraints of coffee Trade		
Inconsistency of merchants and exporters	09	11.25
Low bean prices and lack of merchants and exporters of integrity	09	11.25
Lack of merchants and exporters of integrity	09	11.25
Low bean prices and inconsistency of merchants and exporters	04	5.00
Fluctuating bean price and inconsistency of merchants and exporters	04	5.00
Insufficient produce and bean price fluctuations	04	5.00
Inconsistency of merchants and exporters and inadequate storage facilities	04	5.00
Bean price fluctuations	21	26.25
Inadequate financial capacity	16	20.00
Low bean prices	04	5.00
Total	**80**	**100.00**
Suggestion to solve constraints		
Introduction of trade regulation by government	27	33.75
Government should attract foreign produce buyers to reduce cheating by (local) brokers	09	11.25
Government should provide loan facilities	18	22.50
Cooperative be empowered to buy produce	09	11.25
Government should function as buyer of last resort	04	5.00
Government should re-invent the commodity Board	09	11.25
Trade regulation and control need be enforced/administered by government or coffee union	04	5.00
Total	**80**	**100.00**

Source: Field Survey, 2000/2001.

Table 2: Price and Quantity Variability in Coffee Trade

Factor	Standard Deviation	Mean	Coefficient of Variation
Purchase Price	13.81	₦54,982.10	0.25
Quantity Bought	21.99	34.84tons	0.63
Selling Price	14.55	₦66,887.50	0.22
Quantity Sold	16.56	23.38 tons	0.71

Source: Field Survey, 2000/2001

Table 3: Average Gross Margin of Coffee Trade in Nigeria Coffee Areas

Variable	Amount
Purchase Price(₦)	54,982.10
Quantity Purchase (tons)	34.84
Purchase Cost (₦)	191,880.20
Selling Price (₦)	66,887.00
Quantity Sold (tons)	23.38
Revenue (₦)	158,582.63
Gross Margin (₦)	(33,297.57)

Source: Field Survey, 2000/2001.
Budget: ₦50,000.00
Fund Released: ₦48,000.00
Fund Utilised: ₦48,500.0
Constraints: Insufficiency of fund.

Theme: Finance and Policy Studies.

Task: Determinants of Fund Sourcing and Fund Utilisation by Coffee Farmers. *(*Sanusi, R. A)

Background: Fund is a key factor in any production system. In modern economy, the use of borrowed fund for production activities is inevitable most especially with technological advancement in all spheres of human endeavours. Farmers need money to buy agro-chemicals, pay hired labour, etc. Farmers, in most cases, source for loans from various sources including the (formal) finance houses.

Objective: The aim of this study is to investigate the effect of sources of farm fund on the productivity of (coffee) farmers in Nigeria.

Methodology: The data for the study involved primary data with the use of structured questionnaires. The data collection involved 150 coffee farmers in the coffee growing regions of Nigeria.

Results and Discussion: The questionnaires were constructed but were not distributed due to lack of fund.

Budget Estimate: ₦116,200.00

Fund Released: Nil

Fund Utilized: Nil

Constraints: None release of fund for research

CROP PROCESSING AND UTILIZATION PROGRAMME (Leader: O. O.Sobamiwa)

Title: Utilisation of variously treated cocoa bean shells in layers mash
(Olubamiwa O. and R.A. Hamzat)

Summary: The utilization of variously treated (boiled, sun dried, leached, alkali and urea treated) cocoa beans shell(CBS) in laying hen diet was investigated .A total of 8 dietary treatments which included the control (0% CBS) diet and a commercial diet were used in the trial .The other diets contained untreated CBS, sun dried CBS, urea treated CBS, alkali treated CBS, boiled CBS , and leached CBS. Eighty individually caged, six month in lay pullets were allocated among the diets in a completely randomized design. Each bird, representing a replicate was exposed to unrestricted access to feed and water throughout the 12–week experiment. Parameters evaluated included egg weight, percentage egg production, feed intake, egg mash, feed efficiency, and feed cost /kg egg.

Feed intake was higher ($p<0.05$) on the boiled CBS diet than on the alkali treated CBS diet. Feed efficiency, egg weight percentage, egg production and egg mash were similar on all treatments .Feed cost / kg egg was highest on the commercial diet Egg quality parameters (yolk %,yolk colour ,shell% and egg shape value)were not influenced by dietary treatments It was concluded that further research should focus on a higher level of the variously treated CBS (e.g. 20% maize replacement level) in layer mash .This is likely to show which of the treatments is superior.

Title: Nutritional Quality of Snails (*Archachatina marginata*) Fed Solely with Fresh Kola Testa under Kola Plantation(R. A Hamzat & C. O. Jayeola)

Summary: This experiment was set up to assess the potential of kola testa in feeding African Giant Land Snail (*Archachatina marginata*) raised under kola Plantation. The nutritional qualities of the snail meat was then assessed after the trial. The result showed no significant difference ($p < 0.05$) in feed intake and shell breadth. Significant difference ($p > 0.05$) was observed for weight gain, shell length and carcass analysis. The proximate analysis and sensory evaluation results also showed that the snail meat were not significantly different from each other ($p < 0.05$) for all the parameters analysed.

The experiment revealed that the sensory evaluations of the snail meat were not significantly different from each other for colour, taste, flavour, mouth feel and overall acceptability. The study established that it is possible to feed fresh kola testa to snails most especially by adequate utilization of kola testa which had hitherto been a waste in kola farms in Nigeria.

Title: Studies of the Physico-chemical and Microbiological Changes in Kola Drink During Storage(Jayeola, C. O.)

Summary: Two samples of soft drinks obtained from two species of kola (*Cola nitida* and *Cola acuminata*) were prepared. The samples were subjected to physico-chemical and microbiological examinations over a period of six months. The parameters assayed included colour change, pH, specific gravity, total solid and caffeine contents. Results obtained showed that the colour of samples changed from light to dark red as a result of the occurrence of maillard

reaction, while total solid, specific gravity and pH decreased with storage. Caffeine level especially for *Cola nitida* sample increased from 52 to 110ppm at the end of six months storage. Microbiological studies revealed that there was no significant growth in the samples in the course of storage, hence, making them safe for consumption.

Title: Antimicrobial Efficacy of Cashew Shell Liquid Modified Liquid Soap (Yahaya, L. E.)

Summary: The antimicrobial activity of cashew nut shell liquid soap was studied. The minimum inhibitory concentrations (MICs) were measured for some seleted test organisms viz: *Klebsiella pneumonia, Pseudomonas aeruginosa, Escherichia coli, Staphylococcus aureus.* While *K. pneumonia* and *E coli* are most susceptible to the formulation at 10% (v/v), *P. aeruginosa* and *S. aureus* were susceptible at 8% (v/v). The contact time studies revealed that even at concentration of 12% (v/v), there were no visible increases in the inhibition zone for all the test organisms, hence, supporting the fact that different disinfecting agents work best at different concentrations. The study also revealed that at 1% concentration (v/v), there was noticeable effect of the modified liquid soap on the different test organisms hence its ability to serve both cleansing and disinfecting functions.

Title: Effects of Hot Water Dip, Chemical Treatment and Polythene Film Packaging on Storage Life (Shelf-life) of Cashew Apple(Ogunwolu, S. O.)

Summary: The effects of hot water dip, chemical treatment and film packaging, (applied singly and in combinations) on the storage life of cashew apple were investigated. Fresh cashew apples after removing the nuts and washed, were treated with hot water and Benomyl solution. These treatments were applied singly and in combination and packaged in polythene bags. Untreated apples served as control. The treated and control samples were stored at tropical ambient conditions of 27^oC to 30^oC and were assessed daily for appearance, firmness and loss in fresh weight.

All samples sealed in polythene bags stored better than other methods of storage, and the film packaged was found to have protection against loss in fresh weight of the apples.

There was no incidence of decay in Benomyl treated apples. The Benomyl treated cashew apple sealed in polythene bags increased the storage life of cashew apples at ambient conditions from four to twelve days.

Title: Quality assurance evaluation of chocolate (Aroyeun, S. O)

Summary: The quality of milk chocolate in respect of its microbiological value was studied. The evaluation was done from the raw material stage to the final stage. Samples were collected along the processing line and assayed for microbial load using nutrient agar as the medium. At

the end of the experiment, it was observed that the low counts recorded for the chocolate was as a result of the conching temperature (120^0C), which was unfavourable to growth of spoilage organisms that are thermophilic in nature. The heavy counts recorded for chocolate under storage was due to the post-processing contamination, or the instability in the temperature of the refrigerator in which the bars of chocolate were stored.

Remarks:

Further work is on to characterize the organisms counted and to determine their parthogenicity.

Title: Determination of Selected Organochlorine Pesticide Residue Levels in Cocoa Bean Samples in Nigeria (Ajao, A. A.)

Summary: Ten cocoa bean samples were sampled from Ogunmakin, Iwo and Cocoa Research Institute of Nigeria (CRIN). The samples were chopped with mortar and pestle and homogenized with a blender. Pesticides were extracted from the homogenized samples using the soxhlet extraction method. The organochlorine residues are to be determined with a Gas chromatograph with electron capture detector. The research is in progress.

FARMING SYSTEMS RESEARCH AND EXTENSION PROGRAMME (Leader: Dr. A. O. Famaye)

Task: Determination of suitable intercrops in Coffee plantation
(Adeyemi, E.A. Oloyede, A.A. and Famaye, A.O)
Objective: This study started at Uhonmora in 1998 with the objective of evaluating various arable crop combinations that can be grown alongside coffee (the main crop) with no negative effect on the main crop.
Methodology: five treatment combinations were investigated viz:

(i) Coffee/yam/maize/cowpea
(ii) Coffee/cassava/maize/melon
(iii) Coffee/ cassava/maize
(iv) Coffee/cocoyam/pepper/okra
(v) Sole Coffee.

The treatments were replicated four times. The plot size was 9m x 9m ($81m^2$) giving a plant population of 9 stands.
Results: The results obtained from the study in the year under review are as shown in Table 1. Statistical analysis revealed no significant differences among the treatments evaluated indicating that coffee can be suitably intercropped with the arable combination investigated. This result is in line with previous reports on the experiment. Generally, however. the growth of coffee and associated arable crops were not encouraging. This is attributable to poor nutrient status of the soil. We were reliably informed that the topsoil of the study site had been previously scraped for nursery purpose.

Table 1:Mean values for parameters evaluated (Height, girth, number of leaves, leaf areas)

Treatment	Height	Girth	Number of leaves	Leaf area
Coffee/yam/maize/cowpea	71.17	1.34	38.23	73.00
Coffee/cassava/maize/melon	69.03	1.15	25.28	45.00
Coffee/cassava/maize	80.34	1.50	39.67	67.75
Coffee sole	77.03	1.60	50.08	80.50
LSD(0.05)	NS	NS	NS	NS

Conclusion/Recommendation: the results obtained so far indicate that coffee can be suitably intercropped with arable combinations under investigation. However final recommendation cannot be made for now as the experiment is yet to be concluded.

Title: Determination of optimum spacing and plant population of kola and Citrus in cocoa/kola/citrus intercrop. (Adeyemi, E.A. and Ipinmoroti, R.R, Famaye, A.O. and Olaiya, A.O.

Objective: The objective of this experiment is to determine the optimum plant spacing and population of kola and citrus in cocoa/kola/citrus intercrop.

Methodology: Five (5) planting densities of kola and citrus were investigated in an experiment laid out in a Randomised Complete Block Design (RCBD) with three replicates established in zone 5 at CRIN Headquarters, Ibadan in year 2001. The size of the experimental site is 1.25 ha and the treatments imposed were:

Kola and Citrus each at:

(i) 17 plants/ha (24m x 24m) + cocoa (3.0m x 3.0m)
(ii) 34 plants/ha (24m x 12m) + cocoa "
(iii) 45 plants/ha (21m x 10.5m) + cocoa "
(iv) 69 plants/ha (12m x 12m) + cocoa "
(v) 123 plants/ha (9m x 9m) + cocoa "
(vi) Sole cocoa 1,111 plants/ha (3m x 3m)
(vii) Sole Kola 177 plants/ha (7.5m x 7.5m)
(viii) Sole Citrus 177 plants/ha (7.5m x 7.5m).

Plantain was established in the previous year (2000) as nursery/shade plant. Prior to establishment, soil samples were obtained from the site, processed, analysed for physical and chemical properties and found suitable for the intercrop (Table 1). High mortality of transplanted seedlings of the main and component crops was observed resulting in poor establishment. This was probably due to late transplanting as a result of labour constraint and early stoppage of rains, which predisposed the seedling to a long period of drought. In the year under review, harvests were made from plantain established in year 2000.
It is hoped that labour and irrigation facilities would be made readily available for better establishment of the crop in year 2002.

Table 1: Physical and chemical properties of experimental site:

Soil parameter	Value
pH	6.4
Sand	78%
Silt	2.8%
Clay	19.2%

The experiment was established at Ajassor, Ikom substation in 1995 of which the Headquarters location is a replicate. At Ajassor location only cocoa has started fruiting the data of which was not available as at the time of reporting.

Title: Rehabilitation of moribund coffee/kola intercrop (A.O. Famaye, E.A. Adeyemi and A.A. Oloyede)

Objective: To rejuvenate the unproductive intercrop plot established in 1934 (67 years ago)

Methodology: The plot was demarcated into 9 plots of 18m x 18m consisting of three (3) treatments replicated thrice. The treatments were: Total replanting, coppiced and control (old plot retained). Total replanting treatment involved re-establishment of the plot with 36 coffee seedlings and 4 kola seedlings at 3mx3m and 9x9m plant spacing respectively. For the coppiced plot, the coffee was coppiced at 30cm while kola was 30cm,60cm and 120cm above soil level. Rejuvenated coffee shoots were thinned to 4, while kola stands were thinned to 2 shoots for data collection.

Results: Data were collected on survival count of seedlings, rate of shoot regenerated from coppiced stands, plant height, girth and number of leaves of seedlings and regenerated shoots. Seedling percentage survival were 44.44 for coffee, 66.66 for kola and 11.50 rate of shoots regeneration for coppiced kola (Table 1). The growth situations as reflected in (Table 2) are 46.27cm, 0.76cm, 18.0 for height, girth and number of leaves.
The experiment is in progress and meaningful comparison will be made at fruiting.

Table 1: Mean seedlings survival, stand and shoots Regenerated at 3 Months After Establishment

Crop	Percentage survival count(seedlings	% coppiced stand regenerated	Mean number of shoots regenerated
Coffee	44.44	-	-
Kola	66.66	83.33	11.50

Table 2: Mean Heights, girths and Number of Leaves of Regenerated shoots at 3 Months after Coppicing.

Crop	Height(cm)	Girth(cm)	Number of Leaves
Coppiced Coffee	46.27	0.76	18.19
Replanted Coffee	34.83	0.50	6.08
Coppiced Kola	64.32	1.33	43.7
Replanted kola	30.32	0.50	7.25

Title: Determination of suitable intercrops in Cocoa, Kola and Coffee (Oloyede, A.A., Adeyemi, E.A. and Famaye, A.O.)

Objective: To evaluate different arable crop combinations that can grow alongside coffee (main crop) without any deleterious effect.

Methodology: Four different crop combinations were investigated along sole coffee. The treatments were laid out in a Randomised Complete Block Design (RCBD) with three replications. The treatment combinations evaluated included:

(i) Coffee/Sweet Potato/Maize
(ii) Coffee/Cassava/Maize
(iii) Coffee/Cassava
(iv) Coffee/Cocoyam/Okra/Pepper
(v) Coffee sole.

The coffee stands were planted at a spacing of 3m x 3m. The plot size was 9m x 6m. The growth parameters considered were height, girth and number of leaves.

Results: Analysis of variance revealed no statistical difference among the treatments evaluated. However growth parameters of coffee in Coffee/Cocoyam/Okra/Pepper consistently performed like sole coffee. Adeyemi (2001) obtained similar result at Uhonmora. Table 1 shows the mean values for plant height, girth and number of leaves while Table 2 shows the yield of the various arable crops.

Table 1: Mean plant height, girth and number of leaves.

Treament	*Coffee Growth parameters* Height(cm)	Girth(cm)	. Numbers of leaves
(i) Coffee/Sweet Potato/Maize	55.33	1.60	16.20
(ii) Coffee/Cassava/Maize	42.80	1.55	16.3
(iii) Coffee/Cassava	48.17	1.55	14.00
(iv) Coffee/Cocoyam/Okra/Pepper	58.90	1.64	18.90
(v) Coffee Sole	56.63	1.72	18.90
LSD(0.05)	NS	NS	NS

Table 2: Yield of the arable crops:

Treatments	Yield (Kg/ha)					
	Sweet Potato	Maize	Cassava	Cocoyam	Okra	Pepper
(i) Coffee/Sweet potato/maize	1438.27	1,069.05	-	-	-	-

(ii) Coffee/Cassava/maize	-	1200.50	-	-	-	-
(iii) Coffee/ cassava	-	-	-	-	-	-
(iv) Coffee/cocoyam/Okra/ Pepper	-	-	-	990.04	182.62	131.6
(v) Coffee sole	-	-	-	-	-	-

N.B: The yield is most likely to be under -estimated, as there was serious pilfering in the plot particularly on Okra, Pepper and Cocoyam. Cassava is yet to be harvested

Recommendation: The above Preliminary results revealed that coffee can be suitably grown with some arables. Performance of coffee under Coffee/Cocoyam/Okra/Pepper was the most prominent after sole Coffee. The experiment is on-going.

LIBRARY, INFORMATION AND DOCUMENTATION (Leader: O. A. Fagbami)

The Library provided services to the Institute's Research Officers and other stakeholders of CRIN Mandate Crops through acquisition of information in text and electronic media. The development of Substations' Libraries was further enhanced through supply of some baseline materials to the Substations at Uhonmora, Ochaja, and Owena. Service enhancement protocols were pursued to meet the information needs of the Institute's research activities despite poor funding of the Library. Profiles for Selective Dissemination of Information (SDI) for Researchers were placed on computer. The support derived from collection of materials on CRIN mandate crops from other organizations continued with frequent searches on CD Rom. 12 published articles were acquired in the Library from research staff. In the year 2001, 78 International and local journals with subscription to Daily Newspapers and many research materials on gift and exchange were obtained. 5 books were purchased locally, 1.028 users visited the Library, while 1,304 books, 1,743 journal titles and 205 newspaper titles were consulted: Functioning Photostat machine on commercial operation was put to use. Constraint of the Library mainly was lack of fund.

Suggestion is for the Institute to imbibe current advancement of information transfer and exchange comparable with other notable organizations in its services. The Institute should develop and maintain a website to facilitate collaboration of research activities with other related organizations in other countries. The quarterly magazine of the Institute was resuscitated.

INTERNAL AUDIT (Leader: A. S. B. Akanni)

All the Financial Records, Store Records and Pension Records were audited during the year 2001 and all transactions were recorded according to all extant financial rules.

Procurement Audit was also carried out on most of the goods and services acquired during the period of report.

ENGINEERING GROUP (Leader: G.E. Ubani)

Several activities were carried out during the year in the eight + (8) functional sections of the Group namely:-

1. Mechanical Section

2. Electrical/Telecommunications Section
3. Carpentry Section
4. Civil (Building/Roads/Section
5. Painting/Sign-writing Section
6. Water Works and Plumbing Section
7. Drawing Office
8. Transport Office

Achievements:
We present the achievements recorded in each section below:-

`1. **Mechanical Section**:

i. Routine maintenance and servicing of all the Institute's fleet of vehicles
ii. A major engine overhaul of the Eicher Bus used to convey participants to the year's RIGAN games held at Zaria.
iii. Recovery of the stolen official vehicle FG 743BO3 Pajero Mitsubish attached to the office of the AD (CPS)
iv. Repair and refurbishing of David Brown WAD 2578 utility tractor.
v. The procurement and maintenance of five (5) cars namely, two (2) Peugeot 504, two (2) (Toyota Tercel and one (1) Volvo Ambulance.
vi. Reactivation of all the Institute's Land Rover jeeps aimed at improving
vii. Research work
viii. Reconditioning of Bolts and Nuts
ix. Machining of Flanges and Shafts for Water Works Pumps
x. Production of Sprockets, Cones and Slasher blades for the Tractors
xi. Production of sundry parts for maintenance works such as engine seats, battery seats, bearing and bearing seats, stocks
xii. Fabrication of Bunglary proofs, Iron gates and Doors
xiii. Repair of office chairs, Water Storage tanks and Vehicles
xiv. Repair of leaked Radiators, Fencing Wires and fitting of keys

2, **Electrical/Telecommunications Section:**

i. Regular maintenance and rapid response to fault reports
ii. Collaborated with NEPA to maintain improved power supply from the national grid, sometimes-contributing personnel, vehicle, tools and materials to assist NEPA's fault clearing efforts.
iii. Regular Maintenance of CRIN High Tension (HT) and Low Tension (LT) power lines
iv. Regular maintenance of the Institute's 12.5KVA, 17.5KVA, 27KVA, 50KVA and 250KVA Power Generators.
v. Maintenance of the HT and LT equipment viz: Transformers, RMUS control panels, Oil-cooled Circuit Breakers (OCBs) and Tripping Unit.
vi. Servicing of the Gear switches in the Main Laboratory Blocks Switch Room.

vii. Maintenance of the T16 Panasonic PABX reactivation of some dead extension and the paralleling some extension in the Administrative Office.
viii. Maintenance of the Air conditioners in the Institute
ix. Routine electrical engineering services support to all segments of the Institute
x. Reception of two (2) new 250KVA electric power generators
xi. Installation of one 250KVA Power Generator for use of the Junior Staff Quarters.

3. **Carpentry Section:**

i. Renovation works at quarters PRO 3, PRO 4 and other residential and office buildings
ii. Design and construction side table for Director's office
iii. Construction of formwork for all civil engineering jobs
iv. Sundry repair of doors/replacement of lock sets.
v. Construction of wooden snailery pens for the CPU

4. **Civil (Buildings/Roads) Section:**

i. Renovation work on Quarter DD1
ii. Repair of the damaged perimeter fencing along Ibadan-Ijebu-Ode Road
iii. Maintenance of the Institute's network of roads using excavated earth
iv. Patching of leaking roofs in some of the Institute's Buildings
v. Construction of Septic tank and chamber for the toilet in the office of the Administrative Secretary
vi. Building of an underground water storage tank at the Laboratory Block's Service Reservoir site.
vii. Building of a Poultry House for the CPU

5 Painting/Sign-Writing Section:

i. Repainting of residential/official Buildings such as JSB 85 & 86 JSA 7, 9, 11, 21, 66 & 72 and SS34
ii. Painting of cage and bunglary proofs for the CPU.
iii. Relining of the Lawn Tennis and Badminton Courts at the SS Club House
iv. Attended to all other painting and sing-writing jobs within the Institute

6. **Water Works and Plumbing:**

i. Plumbing renovation works at the Junior Staff Quarter Nos. JSA 5, 6, 21, 28, 48, 49, 69 AND 65.
ii. Plumbing renovation works/reports at the Senior Staff Quarter Nos. D1, PRO3, SS 8, 14, 17, 21 and 24.
iii. Plumbing maintenance on pipe lines to the Junior Staff, T.O and Senior Staff Quarters.

iv. General plumbing maintenance in the CRIN Water Works.
v. Laying of new water supply pipes to CFC Cocoa Plantation behind Zone 1
vi. Installation of lift pump at the Laboratory Block's Service Reservoir.
vii. Installation of water tank for use at the Staff Canteen
viii. Supply of raw water from the water works to the estate.
ix. General plumbing maintenance works at the Health Centre.
x. Excavation laying of pipes and water connection to the CFC Cocoa plantation at Old Kola Laboratory area.
xi. Excavation and laying of pipes for water connector to the CFC Cocoa plantation behind Zone 1.

7. Drawing Office:

i. Preparation of all engineering drawings for project planning and executor as appropriate.
ii. Writing of scientific tables, figures and posters for seminars, conferences and exhibitions.
iii. Tracing of scientific graphs, histograms and pie charts, etc.
iv. Writing of flow charts for the processes of CRIN mandate crops i.e cocoa, kola, cashew, coffee and tea.
v. Layout plan of Ibeku and Ajassor Substations.
vi. Drawing and tracing of the existing, Carpentry Workshop for repairs

8. **Transport Office**:
i. Driving of Vehicles attached to the Institute;s Executives
ii. Driving of vehicles attached to Programmes and Groups
iii. Vehicular Movement of Personnel and Materials to Approved Location with Vehicles from the Pool
iv. Staff Transportation to and from Ibadan City.
v. Procurement and Supply of Portable Water for Use by the Institute and Members of the Institute's Community.

Constraints:

In the course of providing the necessary services by the Group several constraints were experienced. However, the most severe ones were delays in the supply of funds/materials and shortage of skilled manpower in some sections.

Suggestions to Eliminate/Alleviate/Constraints:

The recruitment of skilled personnel to support each of the sections within the Group was recommended and is receiving attention

The stocking of commonly used spare on a re-order level system would go along way to improve the "rate of response" to fault clearing.

Members of Engineering Group remained committed to contributing our best to supporting the Institute’s achievement of her corporate goals in the ensuring year.

FIELD ESTABLISHMENT AND DEVELOPMENT (Leader: A. Borokini)

The section was formerly under the umbrella of Farming System Research and Extension. But at present, Mr. K.T.M. Ojelade , (PRO) stands as the Coordinator of the project.

Aim and Objective: The management of the Institute felt the need to demarcate new farm land for experimental purposes for the new recruited Research Officers willing to carry out a research work on CRIN mandate crops and the old plots planted to CRIN mandate crop were ageing hence there is need to establish new plots.

Project Team Members:

Mr. A. Borokini	-	P.A.S. I - Team Leader
Mr. T. Adewumi	-	P.A.S. II - Member
Mr. A.A. Akinola	-	H.A.S. "
Mr. Rufai Okunola	-	S.A.F.O. "
Mr. J. Monkio	-	S.A.F.O. "
Mr. P. Akinola	-	F.A. "
Mrs. B. Ogunsola	-	Typist "
Mrs. B. Olabiyi	-	Messenger "

Field Activities: Further felling of Economic Trees on the 55.4 ha. of new farm for 2001 planting season started in December 2000 and was completed in April 2001. Under- brushing of the 55.4ha. of the new plot started in the same month and completed by May. Cross-cutting of the felled trees to allow easy movement, and for operations like lining, and pegging, started in April. Planting of the mandate crops and shade trees started in June and was completed by 2nd week of August. Only 40 ha. out of 55.4 ha. of land earmarked for 2001, planting was planted. remaining 15.4ha. which hopefully earmarked will be planted during 2002 planting season. Details of the planting activities for the year 2001, are shown on the Table below:

Table I: Crop Allocation to 55.4 ha. during 2001 Planting Season

	Crop	Allocated No. of ha..
1.	Cocoa	20.6
2.	Cashew	16.9
3.	Coffee	10.0
4.	Kola	7.9

Table II : Total Areas Planted and the Number of ha. unplanted

Crop	No. of ha. allocated	No. of ha. Planted	No. of ha. Unplanted

Cocoa	20.6	13.6	7
Kola	7.9	4.6	3.3
Cashew	16.9	11.8	5.1
Coffee	10.0	10.0	-
Total	**55.4**	**40**	**15.4**

Problems and Constraints: The project was faced with some problems and constraints, hence much could not be achieved as planned.
The problems and constraints were: Transportation, Labour and planting materials.

Cocoa Yield Records for January to December 2001

No	Month	Total No Of Pods Harvested	Field		No of pods issued	No of pods obtained	No of B/pods at Breaking	No of Fermented Pods	Net Weight (Kg)	Weight After Fermt	Dry Weight (Kg)
			B/pods	D/Pods							
1	Jan	48813	3684	479	100	44550	8865	39369	3863.0	3461.8	1656.0
2	Feb	19822	2428	247	941	16206	4977	13657	1316.2	1182.8	592.6
3	March	14880	1540	260	350	12730	4066	10193	956.0	869.8	406.1
4	April	20904	1018	254	350	19282	4610	15690	1445.5	1320.6	531.1
5	May	16406	681	269	-	15456	4597	11540	952.0	864.4	370.9
6	June	19348	948	535	145	17720	5359	13309	118.0	991.0	419.4
7	July	12743	1052	279	135	11277	3094	9235	810.2	745.0	286.6
8	Aug	11037	2829	297	-	7911	2228	8510	764.4	670.0	261.2
9	Sep	20043	8324	291	100	11328	2951	16701	1590.8	1401.4	573.1
10	Oct	37009	14755	514	1750	19986	5332	29409	2730.4	2487.2	1036.4
11	Nov	69780	4577	1419	5480	56304	7652	55231	5046.1	4686.4	2105.0
12	Dec	53954	1154	993	80	51727	2628	50253	4560.2	4226.4	2060.1
	TOTAL	344739	44994	5837	9431	284477	56359	273097	25152.	22906.8	10298.5

Internally Generated Revenue (₦) January to December 2001.

Items	Jan.	Feb.	Mar.	Apr	May	Jun.	Jul.	Aug.	Sep	Oct.	Nov.	Dec.	Total
Beans	204,000	70,000	95,000	-	85,000	-	-	-	72,000	-	95,000	130,000	851,000
Cocoa Pods	450	5,550	2,250	1,250	250	725	205	100	-	36,750	5,900	400	53,830
CocoaSdl.	40,080	2,000,000	50,000	50,600	37,240	70,300	16,900	2,000	1,370	-	-	-	2,268,490
Kolaseedl.	1,820	-	6,500	-	3,380	650	1,072.50	52	-	-	-	-	13,474.50
Kolanuts	-	150	975	-	170	-	-	-	-	-	-	-	1,295
CoffeSedls.	-	-	-	-	-	-	120	-	50	-	-	-	170
CoffeeBarer	-	180	-	-	-	-	-	-	-	-	-	-	180
Cashewnuts	-	-	75	-	27,540	7,200	5,100	3,000	-	-	1,200	-	44,115
CashewSdls.	-	-	3,250	500	-	7,500	5,785	-	500	-	-	-	17,535
Plantain	14,025	6,000	2,475	150	-	-	75	5,400	5,325	12,450	12,600	24,750	83,250
`` Suckers	-	-	7,000	-	10,000	5,000	1,500	-	-	-	1,000	-	24,500
Banana	460	680	120	-	-	-	-	-	160	460	1,200	860	3,940
Other farm Produce .	3,540	1,250	10,875	800	400	17,873	20,480	4,905	3,390	3,200	38,901	1,950	73,698
TOTAL	264,375	2,083,810	178,520	53,300	163,980	109,980	51,237.50	15,45	82,795	52,860	221,926	157,9603	435,468.50
Rent	4,060	10,500	7,340	7,225	6,825	11,300	5,175	4,025	6,200	4,650	11,750	13,405	92,455
Library	1,216	2 ,159	1,393	1,200	-	3,540	-	516	1,152	-	-	-	11,176
Rest House	-	400	1,000	3,900	7,400	1,700	1,250	4,000	5,700	900	1,000	8,750	36,000
HealthCentr	875	2,400	1,950	1,050	1,200	2,950	1,250	1,425	1,650	-	-	2,695	17,445
Bus ticket	14,560	18,800	17,710	8,610	11,780	12,720	6,530	8,150	4,450	8,140	6,060	6,840	124,350
Workshop	-	-	-	-	-	-	-	-	-	-	-	390	390
Sundry	7,710	19,720	18,375	25,680	10,210	15,855	18,000	4,860	2,390	4,450	7,760	10,570	145,580
TOTAL	292.769	2,137,789	226,288	100,965	201,395	157,313	83,442.5	38,433	104,337	71,000	248,496	2000,610	3,862,864.50

OWENA SUBSTATION (Officer In-Charge: T.B. Akintoye)

Physical Development: Through the special grace of God the Station experienced some physical developmental changes during the year. The maintenance of old structure was not also neglected. Some of the development was in form of construction, installation and repairs which include:

1. Establishment of a small cocoa plot for experiment
2. Provision of furniture in the gate house
3. Construction of a security gate house
4. Partitioning of the Agricultural Superintendents Office
5. Installation of modern radio-phone
6. Refurbishing of furniture (settee) in the Officer-In-Charge"s quarters
7. Purchase of medium size Refrigerator for the Officer-In-Charge's quarters
8. Purchase of ceiling fans for the P.A.S. I's Office and the Rest House
9. Repair work on some residential quarters
10. Replacement of doors and frames at the main store, rest house and the Officer-in-Charge's quarters
11. Overhauling of the Mitshubishi pick-up engine
12. Purchase of intercom for the main office/Security gate house
13. Provision of visitors seat at the Officer-in-Charge's Office
14. Maintenance of water and electricity projects and prompt payment of bills
15. General repairs on the vehicles – 404, Tractor and two motor-cycles
16. Establishment of Meteorological Station (yet to be completed).

Vehicle: The three functional vehicles, the 404 pick-up, the Mitsbuishi pick-up and the tractor M.F. performed beautifully well during the year. The Mitsbuishi pick-up had its engine overhauled while the 404 pick-up had its back axle and propell er replaced. The two pick-ups would be due for servicing early next year.

The Bedford lorry has a theft case of the gear box which is still pending in court. The Volkswagen staff bus would also need a replacement of its engine.

Radio-Phone: The station is most grateful for the installation of a modern and functional radio-phone. Communication has been easy with the Headquarters.

Revenue: An annual revenue of five hundred and thirty-two thousand, and nineteen naira one kobo (N532,019.01k) was realized from the sales of farm produce and other services during the year under review.

The breakdown is as shown in the Table below:

Nos.	Items	1st Qrt. Jan-March	2nd Qrt. Apr-June	3rd Qrt. July-Sept.	4th Qrt. Oct-Dec.	Total
1	Cocoa Beans	36,400.00	157,304.00	30,000.00	63,755.00	286,478.00
2	Cocoa Pods	7,700.00	7,400.00	1,150.00	660.00	16,910.00
3	Plantain	5,550.00	225.00	1,500.00	3,375.00	10,650.00
4	Plantain suckers	-	3,900.00	100.00	-	4,000.00
5	Farm Produce(Agbalumo)	55.00	-	-	-	55.00
6	FMCT (Cocoa) Seedlings)	7,052.00	9,000.00	9,930.00	-	25,982.00
7	Rent (Tenants)	18,730.00	10,400.00	6,600.00	10,600.00	46,530.00
8	Rent on Pay Roll	31,177.11	32,841.47	33,201.96	33,895.47	131,114.01
9	Tractor Services	1,500.00	-	2,500.00	500.00	4,500.00
10	Rest House	800.00	2,000.00	-	3,000.00	5,800.00
Total		108,964.11	223,069.47	85,001.96	114,983.47	532,019.01

Research Activities: All necessary data collection and collation were carried out on on-going experiments in the station. The experimental plots were also taken care of inspite of the problem on payment of wages. Maintenance operations and processing of farm produce were also carried out. Some of the experiments include:

(a) Intergrated Pest Management (IPM) - Dr. O. L. Idowu
(b) Cocoa Rehabilitation and degradation Agents - Dr. S.O. Agbeniyi
(c) Cocoa Herbicide Trial on young cocoa - Dr. A.A. Adeyemi
(d) Effect of Inorganic Fertilizer on coffee - Dr. C.R. Obatolu
(e) Seed Garden Reactivation - Badaru/Aikpokpodion
(f) Soil -Based Fertilizer - Dr. C.R. Obatolu
(g) Roles of termites in the degradation of trunk of cocoa - T.C.N. Ndubuaku
(h) Fungicide trial - Dr. S.O. Agbeniyi
(i) Black pod epidemiology observation - Dr. S.O. Agbeniyi

FMCT/CRIN Cocoa Project: There was no raising of seedlings during the year, but the left-over from year 2000 were adequately maintained and some were cut back to reduce the growth. It was alleged that the Akwa Ibom State Government had purchased the seedlings, a letter No. Res.5/2/Vol.IVI/368 of 9th April, 2001 refers. However only few were sold, the rest are lying in the nursery sites (Owena and Ibule).

Weather Record: Establishment of the new weather station commenced and some of the equipment were ready for installation. The approval for the purchase of fencing wire and installation fee for the equipment has been granted but without cash backing due to lack of fund in the Institute.

However, the total rainfall (mm) recorded for the year is as stated overleaf.

Quarter	**Rainfall (mm)**	**No. of days**
1st Qrt. Jan-March	154.4	13
2nd Qrt. April – June	494.9	38
3rd Qrt. July – September	662.7	56
4th Qrt. October-December	63.2	10
Total	1376.2 (mm)	117 days

Health Services: There was no supply of drugs despite the station's requisition. The drugs got exhausted in the 2nd quarter of year 2000.

Staff Disposition and Welfare: The staff strength of the station stood at 24 as at 31st December, 2001 the list of staff is as shown below:

S/No.	Post	Owena	Ibule	Ile-Oluji	Onisere	Total
1	Princ. Agric. Supt I (USS 11)	2	-	-	-	2
2	Princ. Agric. Supt (USS 9)	-	1	-	-	1
3	Princ. Exec. Officer II (USS 9)	1	-	-	-	1
4	Snr. Agric. Supt. (USS 8)	1	-	-	-	1
5	Snr. Typist Grade I(USS 7)	1	-	-	-	1
6	Chief Typist (USS 8)	1	-	-	-	1
7	Asst. Chief Field Overseer (USS 5)	2	-	-	-	2
8	Senior Clerical Officer (USS 5)	1	-	-	-	1
9	Senior Agric. Field Overseer (USS 4)	1	1	-	1	3
10	Senior Agric. Field Overseer Security (USS 4)	2	-	-`	-	3
11	Motor/Tractor Driver/Mechanic (USS 3)	1	-	-	-	1
12	Security Assistant (USS 3)	2	-	-	-	2
13	Store Assistant (USS 2)	1	-	-	-	1
14	Security Guard (USS 2)	-	1	-	-	1
15	Agric. Field Attendant (USS 1)	2	1	-	-	3

Industrial Field Practical: Two students of the College of Education, Ikere Ekiti were at the station for two months (August – September) on Industrial Training. They were exposed to various sections of the station to acquire the much needed exposure.

Retirement from Service: Three members of staff all from the Security Section retired from the service of the Institute. They were Mr. Emmanuel Ajewole (SAFO, Security) who retired in May while Messrs Mathew Oko and Lasisi Oladipupo (Security Assistant) retired in December.

Obituary: The ugly hands of death snatched two members of staff Messrs Dada Obembe and Karimu Ayinla on the 9th February and 24th September, 2001, respectively. The two men were Agric. Field Attendants attached to Ibule and Owena stations. The two men have since been buried. May their Souls Rest in Perfect Peace.

Visitors:	Dr. C.R. Obatolu	-	AD/CRIN	-	on transit
	Dr. O.L. Idowu	-	AD/CRIN	-	on transit
	Dr. E.B. Esan	-	AD/CRIN	-	on transit
	Mr. J. O. Babafemi	-	Ag. Admin. Secretary	-	on transit
	Mr. Sola Adefaka	-	Asst. Chief Accountant	-	on transit
	Prof. L.K. Opeke	-	CRIN Agric. Consultant	-	on visit
	Mr. Bolarinwa	-	Audit	-	CRIN, Ibadan
	Mr. J.O. Shote	-	CRIN	-	on transit
	Mrs. C.O. Ogundipe	-	On Research Programme		

Appreciation: The station is most grateful to the Headquarters for the prompt remittance of salaries as at when due. This enhanced higher productivity and other successes achieved.

The station is also grateful to the Chairman and the Board members of the CRIN Governing Board for the installation of the modern radio-phone in the station. This, no doubt improved the communication system.

CRIN MAMBILLA SUBSTATION (Officer-in-Charge- R. A. Madehin)

Field Operation

Kusuku : The general maintenance of the plots, residential quarters and office complex got to top gear in March. The first rain for the year was on the 25th day of March 2001 with 2.7mm recorded. The tea seedlings in the two nurseries were subjected to hardening process prior to transplanting in the incoming season (year 2002).

For continuity in coffee seedlings production in the substation, over five thousand berries were sown on flat beds for onward transplanting into polythene bags thereafter. Insecticide and fungicide applications and compound fertilizer application were administered on established coffee and tea fields during the season. Also, Organo-mineral application in line with the directive from the designer of the experiment was carried out.

Banana stands were introduced as cover crops for coffee as practiced on the plateau.

Mayo-Selbe : General maintenance of the plot was observed as part of the cultural operation. Both fungicide and insecticide applications were executed as found necessary. Basudin application was mainly used to curb the incidence of termites attack common in the station during dry spell. Cutting of fire traces and controlled burning to prevent fire incidence as experienced in the past was able to prevent the plots from deliberate fire usually set from neighbouring farms., before rain establishment for the season.

As it was in year 2000, Brazilian cashew was introduced by the programme Leader, Mr. E.A. Ayodele for representation in all CRIN Substations. The establishment in Mayo-Selbe was very successful because of weather conduciveness, but the percentage germination for cashew nuts raised in Kusuku was very discouraging with stunted growth and eventually they withered away like what obtained last season (year 2000). There was improvement in establishment in Mayo-Selbe as against the poor performance experienced in Kusuku.

Physical Development : The general overhauling and resuscitation of electricity supply through Viva generating set FIAT 640 became a reality in August, 2001. The station could not afford the cost of wiring for extension to office complex and suburb. The request already made to the Management was yet to attract approval and funding. Also request had already been made to the Management for the extension of pipe-borne water to the nursery site to facilitate effective seedling nurturing during dry spell.

Revenue

1ST Quarter	2nd Quarter	3rd Quarter	4th Quarter	TOTAL
January-March	April-June	July-September	October-December	
₦13,197.50	₦24,899.31	₦27,142.80	₦32,856.28	₦98,095.89

The total sum of ninety-eight thousand, ninety five naira and eighty-nine kobo (₦98,095.89) was generated for the whole year. The accrued revenue for the year on quarterly basis is analysed in tabular form above.

Personnel : Twenty staffers were on roll as at the end of December 2001 as against twenty four hitherto maintained. This was due to retirements and resignation. The vacant posts of Health Attendant, Typist and two security men are yet to be filled since the end of March 2000.

Weather Record-Rainfall (mm)

1ST Quarter			**2nd Quarter**			**3rd Quarter**			**4th Quarter**		
JAN	FEB	MAY	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
-	-	75.8	306.6	285.3	556.6	419.3	429.1	343.6	457.5	-	-
	75.8			1148.5			1192.0			457.5	

The total amount of rainfall recorded for the year was 2873.8mm and the quarterly breakdown is in tabular form above.

Visitation :Visitors came in within the year both from CRIN Headquarters, Ibadan, Taraba State and environs. The visitors and the mission to the substation are reflected in tabular form below:

No	Name(s)	Position	Address	Date of visit	Purpose
1	Mrs. Imatu E. Ishaya	Staff Bauchi Adult Educ. Institution	Kangere	12/1/2001	Collection of specimen
2	Mr. S.S. Omolaja	Principal Research Officer	CRIN Ibadan	25/1/2001	Data collection
3	Mr. Ipinmoroti, R.R.	Research Officer	CRIN Ibadan	25/1/2001	Setting up of Experiment & Data Collection
4	Mr. Femi Sote	Admin. Officer	CRIN Ibadan	16/2/2001	Personnel Auditing Programme
5	Mr. Ayo Odusote	Admin. Officer	CRIN Ibadan	16/2/2001	Personnel Auditing Programme
6	Messrs Simon Bodi & Adams Danladi	Staff	Dabuka Nig. Limited	8/2/2001	Familiarization Tour
7	Mr. Adebola, P.O.	Principal Research Officer	CRIN Ibadan	18/5/2001	Official Tour
8	Mallam Tukur, H.A.	Manager	N.B.P.C. Ltd. Tea Estate Kakara	21/5/2001	Routine Consultation
9	Messrs Fidelis George & Shehu Jimon	Students	College of Agric. Jalingo	22/5/2001	Administration of Questionnaire
10	Baba A. Hammaiyano	TA.D.P. Staff	T.A.D. Gembu	15/6/2001	Specimen request
11	Chief J.O. Ogunbayo	Chief Admin. Officer	CRIN Ibadan	18/6/2001	Pension Auditing
12	Mr. S.A. Osun	Admin. Officer	CRIN Ibadan	18/6/2001	Auditing of Retirees
13	Dr. E.B. Esan Dr. C.R. Obatolu	A.D. (C.I.M.) A.D.(T.T.D.P.)	CRIN Ibadan “	14/9/2001 “	On Land Matters “

Mr. S.E. Ebohon	A.C.A.O	"	"	"

CRIN IBEKU SUBSTATION (Officer -in –Charge: M. S. Efunla)

Revenue: The sum of two hundred and thirty-eight thousand, one hundred and twenty-five naira (₦238,125.00) was realized from the sale of farm produce in the Substation during the year under review. The details are shown below:

Cocoa beans		₦ 99,115.00
Cocoa Seedlings		47,000.00
Cocoa pods		60,700.00
Cashewnuts		28,720.00
Banana		260.00
Oranges		140.00
Dicanuts		320.00
Mango		40.00
Plantain		50.00
Firewood		1,800.00
	Total =	**238,125.00**

Field Operations: Routine management operations vis-à-vis slashing, pruning, spraying against pests, diseases and control of weed; harvesting and processing of farm **produce** were promptly carried out during the year under review in all the plots within the estate both at Ibeku and Ugbenu. Maintenance of grounds, lawns and roads around the office and plots was also carried out.

Nursery Operations: The remaining cocoa seedlings raised in 1999/2000 season under FMCT were sold to the Abia State Government, no seedlings were raised for the farmers in year 2001 since there was no such directive from the Headquarters and no fund was made available to execute the project.

Physical Development Minor repairs were carried out in the main office block. The main office block at Ugbenu requires repairs largely because of the deteriorating condition of the building. The two old buildings inherited from the defunct Ministry of Agriculture of the then Eastern State are also in a state of disrepair. Fund should be made available to the Station for the repairs.

Transportation: The only functional vehicle in the Station is old and unreliable and cannot be used to undertake a long journey hence the station is in dire need of a sound vehicle.

Staff and Labour Disposition: The staff strength as at the end of December 2001 stood at fifteen (15) 4 senior and 11 junior staffers. The station also maintained eight (8) casual workers approved by the Headquarters.. This number is grossly inadequate considering the size of our plantations both at Ibeku and Ugbenu out-station. There is need to increase the number in the coming year to be able to cope with the workload in this substation. The security of the Substation needs to be beefed up considering the frequent incidents of pilfering in the plantations.

Radiophone: The radiophone installed in the Substation sometimes ago is not functioning. The contractor should either change it for a new one or get the old one repaired.

Finance: The purse of the substation was very lean during the period under review as there was no regular remittance of subvention and wages from the Headquarters. It is hoped that by the coming year fund will be made available from the Headquarters particularly for the payment of wages to avoid being attacked by the casual workers.

E.R.L.S.: All the farmers and members of Agricultural Associations who visited the Station during the period under review were well received. Other important personalities that the station played host to during the period were, Senator Emma Nwaka, the Commissioner of Agriculture, Abia State and a host of others.

UHONMORA SUBSTATION (Officer-in-Charge: J.A.O.Akinboboye)

Work started in January, 2001 with the twenty-four (24) staff and seven (7) casual labourers By the end of February, funds of the FMCT with which we paid wages was exhausted and we had to lay them off until 1st July when approval came from the Headquarters for the employment of ten (10) casual workers. The time witnessed low performance in all our fields of work except in the office as we were left with only seven (7) field attendants to cater for nursery, field work and ground maintenance. .

Research Activities: In addition to regular data collection on all existing experimental plots on Coffee Farming System, coffee Shade Trial, Cocoa Fungicide Trial, Organic Fertilizer in Cashew and the Twenty-five Genotype Trial, another P/45 Organic Fertilizer and Mycorrlizal Inoculation on the growth of cashew were newly started by Mr. Ibiremo and Mrs. E.A. Adeyemi respectively.

CRIN/FMCT Cocoa Seedlings: Money and time spent on cocoa seedlings advertisement yielded dividend during this period as cocoa farmers trooped into the Substation for purchases. We had to be turning them back as I was ably informed by late Dr. C.R. Obatolu that the remaining seedlings of the 1999/2000 year season had been paid for by some Eastern States Government of Nigeria. After a lot of pressure from farmers in Edo and Delta States, I came to Ibadan and met Dr. O.L. Idowu who advised us to be making little sales to Farmers around us. The Eastern States Government officials did not turn up eventually throughout the planting season.

Rainfall: Below is the rainfall pattern during the year:

Months	Rainfall (mm)	No. of days
January		
February		
March	45.7	5
April	174.9	8
May	94.6	5
June	279.6	10
July	243.4	13
August	82.9	12
September	414.7	17
October	80.0	8
November	7.4	1
December	4.1	1
Total =	**1427.3**	

Revenue: A grand total of four hundred and fourteen thousand, seven hundred and fifty-five naira, nine kobo (₦414,755.09) revenue was generated during the year. The breakdown is as follows:

		₦
Dry Cocoa Beans	-	41,447.50
Plantain	-	3,060.00
Oranges	-	1,500.00
Maize	-	5,750.00
Cassava	-	2,810.00
Pineapple	-	1,180.00
Vegetable	-	1,460.00
Cocoa Pods``	-	1,100.00
Cocoa seedlings	-	55,952.00
Cashew Seedlings	-	5,520.00
Cashew Nuts	-	150.00
Stray Goats	-	1,200.00
Mango	-	330.00
Ugeh Fruits	-	1,110.00
Ogbono	-	6,520.00
Rent	-	152,395.59
Dukanut Seedlings	-	1,700.00
Timber	-	123,600.00
Kola Seedlings	-	250.00
Oil-palm Seedlings	-	6,650.00
Oriri Fruit	-	570.00
Surcharge on destruction of flowers	-	500.00
Total	=	**₦414,755.09**

Efforts At Revamping Plots: When I arrived the Uhonmora Substation in December, 1999, I discovered that many cocoa trees had died and were not gapped, hence I commenced an aggressive programme of gapping up the plots with the present available manpower. It is note worthy that too many plots have been lost to the forest due to lack of maintenance since the 1985 mass retrenchment of staff. Continuity in the present tempo of maintenance will sustain this programme.

Plot Maintenance: Plot and ground maintenance suffered seriously between March and July, 2001 because of the lay -off of casual workers due to lack of funds. It was in July that we were able to move with mild force into the plots as a result of approval from the Headquarters for the employment of ten (10) casual workers. At this stage I wish to implore Management to pay great attention to the employment of field assistants/attendants and daily- rated workers who are the main work engines of the Institute's fields. This group of workers should be given good incentives like promotion and staffing urgently to enhance their productivity.

Enlightenment Of Farmers: It was discovered that some cocoa growing farmers were not fermenting their wet cocoa beans as prescribed by CRIN. Enlightenment pamphlets

were distributed in Edo and Delta States and a letter was written to the Director/Chief Executive on the need for a large- scale awareness campaign on proper fermentation.

Timber Felling: Applications started coming in for timber felling within CRIN Estate towards the end of the year. These applications were sent to the Director/Chief Executive's Office, Ibadan. Later we learnt that it was the Chairman, Governing Board who will handle the operation, hence the transfer of all duplicate applications to him.

Illegal Timber Felling: On 2nd May, 2001, a gang of illegal timber fellers led by Mr. Henry Iyayi entered CRIN forest, felled cross- cut and stole away 140 economic trees of various species. A report was made to the Chairman, CRIN Governing Board on his way from Abuja. He reported the case to the Edo state Task Force on Forestry, Benin and I made verbal and written statements which I have forwarded to the Headquarters on demand. I am yet to hear from the Task Force since my last visit

Staff Disposition And Welfare: Staff members here stood at twenty-four (24) made up of five (5) senior staff, nineteen (19) junior staff and ten (10) casuals until December 4th when Mr. H.N. Onyia (S.A.S.) died. One thousand and sixty-nine (1,069) patients were treated at the dispensary during the year. The Substation is grateful to Management for drug supplies'.

Students Field Practical Training: Students of the University of Benin, Faculty of Agriculture who were supposed to come and start their field practical training on November 4th 2001 did not come but sent a letter to change the date on 4th February, to April 4th, 2002.
The students of Edo State College of Agriculture, Benin City who were also to have been here between August to October, 2001 did not come eventually.

Promises of the Edo State Governor: It will be recalled that during the Inaugural visit of the Governing Board to the executive Governor of Edo State, Chief Lucky Igbinedion on 20th November, 2000 he promised to give the Uhonmora Substation an electricity transformer and a tractor.

The transformer was collected at the Electricity Board, Benin on 17th April, 2001. We could not get the tractor up till the time of writing this report. When I visited the Ministry of Agriculture, Benin on 11th July, 2001, the Permanent Secretary told me that all tractors they had are second hand and broken down and that they have sent memo to the Governor to release funds for their refurbishment. Money has not been released for the repairs. I later reported to the Chairman CRIN Governing Board. I shall pursue the tractor affair early in year 2002.

Re: Outstanding Request for Year 2000: In my year 2000 Annual Report I made mention of our numerous requests that did not get the Director/Chief Executive's approval which caused a lot of set- back to the functions of the substation. After the death of our late Co-ordinator, Mr. E.A. Fawole, majority of the substation's letters of request were met on his table.

Electricity Generation: The Substation's electricity generating set is performing well. We still maintain our one hour at night on three (3) days a week plus occasional few minutes to radio-phone the Headquarters. The generator is now due for servicing and some parts would have to be changed for its proper functioning. Quotation for this servicing has been sent to the Director/Chief Executive.

Meanwhile work has started in earnest by the electrical contractor for the electrification of the Estate connection to the national grid. I on behalf of all staff of the substation wish to use this opportunity to sincerely thank the Governing Board and CRIN Management for extending this grace to Uhonmora Substation since its establishment in 1967.

Refurbishment Of The Radio-Phone: The Station's old radio-phone box was refurbished during the period of report. I am grateful to Management on this development as this will now reduce the travels to Ibadan for information. There still the need to do some conversion on it in order to make use of the battery.

Fire Problem: While I described the year 2000 fire problems as unprecedented, the year 2001 was more serious as fire gutted nearly all forests in the Owan West Local Government Area. Despite the large fire traces cut and the relearning from time to time and vigils kept fire still affected two of our plots. They are plots of B5 2 hectares, containing Oro Selection Cashew and B5 (2.5 hectares) containing grown up kola. These fire inidents were promptly reported to the Headquarters. Some of the crops in the plots regenerated when the rains were established.

Transportation: The Pick-Up Van FG.267 AO3 broke down in April, 2000. The report was made to the Headquarters.

The station Wagon also broke down in March 2001 and was refurbished in July with funds from the Headquarters. We had to change the brake master and carburetor in December in order to be able to go with the vehicle to Enugu State for the burial of Late Mr. H.N. Onyia (Senior Agric. Supt.).

The Suzuki Motorcycle TS 185 did well till August, 2001 when it broke down completely.

Security: It is noteworthy that we are making use of only three staff and one casual watchmen for the vast 268.4 hectares substation's estate. This is grossly inadequate for the Estate. I have made case for this to the Director/Chief Executive. The Estate is very porous and needs an increase in watchmen. We are the only settlement on the abandoned old Uhonmora – Ozalla highway. An urgent action on the improvement of security network of the substation will be highly appreciated. It was inadequate security that led to large scale illegal felling of economic trees on the Estate between May and June, 2001, burning of plots, and stealing of revenue generating items.

Self -Help Project: During the period of report, making use of soft wood planks here, we named the roads on the Estate after CRIN Mandate Crops and also painted the Emblem of the Institute on five surfaces of the Substation's Sign Boards.

Gift: The Assemblies of God Church, CRIN Assembly made a donation of two unbreakable plastic chairs to the substation's library during the period of report. I am grateful to them.

Visitors: The following are our visitors during the year:

Mr. T.C.N. Ndubuaku	CRIN Headquarters, Ibadan
Mr. A. Ayodele	"
Dr. T.O. Adejumo	"
Mr. O.S. Adefaka	"
Dr. C.R. Obatolu	"
Dr. J. Azebua	A. A. U. Ekpoma
Mr. F. Ehagbai	AUVAK Farms, Agenebode
Mr. E. Ogbontian	Benin
Mr. A.A. Odusote	CRIN Headquarters, Ibadan
Mr. J.O. Sote	"
Dr. E.V.O. Ogbeide	Chairman, Governing Board, Benin
Mr. B. Agbontan	Binten Engineering, Benin
Mr. A.S.B. Akanni	CRIN Headquarters, Ibadan
Dr. A.O. Famaye	"
Mr. N. Alao	Usun Ivbiaro
Mr. F. Avagha	"
Chief J.O. Ogunbayo	CRIN Headquarters, Ibadan
Mr. S.A. osun	"
Rev. O.O. Oduwole	"
Mr. Abass	Electricity Contractor , Ibadan
Mrs. E.A. Adeyemi	CRIN Headquarters, Ibadan
Mr. A.A. Oloyede	"
Mr. D.O.T. Ofunre	First Bank Plc., Sabongida-Ora
Mr. R.I. Aghughu	Tree Crop Unit, Benin
Mr. A. Adeyemi	CRIN Headquarters, Ibadan
Mr. T. Aminu	Forestry office, Sabongidda-Ora
Dr. A.T. Adekunle	University of Benin, Benin
Dr. C.I. Okungbowa	"

Obituary: Mr. E.A. Fawole, the Uhonmora Substation's Coordinator died and was buried in his home town, Odeomu on 23rd March, 2001. The Substation was well represented at the burial.

Mr. Henry Nkem Onyia**:** (Senior Agric. Supt.) attached to Uhonmora Substation died on the 4th December, 2001and was buried at his home town Umuigwe-Umuaga Udi Local Government Area of Enugu State on 14th December, 2001. I wish on behalf of all staff of the Uhonmora

Substation thanks CRIN Management for providing money and logistics to the substation during the burial ceremonies.
The death of Dr. C.R. Obatolu also came to us as a rude shock on 30th November, 2001. The Uhonmora Substation was fully represented at his burial on 7th December, 2001 in Kabba, Kogi state. I pray for the repose of their souls. May God take care of their aged parents, wives and children. Also pray that God in His infinite mercy uphold the CRIN family.

Observation and Recommendation: Since the mass retrenchment of staff in 1985, a lot of mandate crop plots have been lost to the forest. Despite the efforts of past administration, the situation is still the same. Since CRIN is a centre of excellence efforts should be geared at the employment of workers of the lower level cadre e.g. field attendants/ assistants and casual workers in order to reclaim the plantations and enhance revenue generation.

Appreciation: On behalf of all staff of the Uhonmora Substation I thank the Governing Board, the Director/Chief Executive and the entire Management for keeping us in employment and solemnly promise our continued loyalty to the Institute and the Federal Republic of Nigeria. I also promise, if given the wherewithal, to work, to restore the Uhonmora Substation to the glorious position it was before the 1985 mass retrenchment of staff.

I wish the Governing Board, Director/Chief Executive and the entire Management, all staff of CRIN a prosperous and more resourceful year 2002.

OCHAJA SUBSTATION (Officer-in-Charge: A. Ajani)

Personnel Report: The staff strength as at 1st January, 2001 – December, 2001 was made up of 4 senior staff and 15 junior staff.

Casual Labour Force: The substation maintained a total Number of 11 casual workers for both field cultural operations and other essential services. Below is the analysis of the casual labour.

Field maintenance		7
Dispensary (Dispensary casual attendant)		1
Security Guards (casual)		2
Transport (Casual Driver)		1
	Total =	11

Field Maintenance: Maintenance of both experimental and commercial plots was adequately carried out. The station has successfully nurtured to maturity over 80% of the new plantings despite the difficult situation created by extremely hot weather coupled with executive and prolonged harmattan.

During the dry season (October-December) which was very crucial and critical, cultural operations such as cutting of fire traces, controlled burning and removal of dried woods were carried out.

Production of Cashew Seedlings: In addition to the 250 cashew seedlings planted at Corn in Nasarawa State, the station raised nine thousand cashew seedlings for both her establishment (2001 planting) and supply to farmers in Kogi State in general. This was announced over radio Kogi for individuals to benefit from the distribution of our improved cashew seedlings which were sold out due to lack of transportation and unfavourable weather condition. The latter being evident from the meterological data, which recorded only 12 rainy days in June, 12 in July, 9 in August and 17 in September, 2001.

Consequently, one cannot dispute, the fact that weather is one of the major determinants of human needs particularly farmers' activities.

State of Fields/Plantations: The substation maintained a high standard of farm sanitation and cultural operations. Light pruning and regular slashing were carried out appropriately.

Nursery/Data Collection: Proper records/Data on the research materials raised in the Nursery were taken as at when due and kept for further studies.

Kola Production: The substation supplied ADP Allma in Ofu Local Government area in Kogi State with improved Kola seedlings for the year 2001 planting season. Efforts are in top gear to construct a concrete propagator for raising both Kola seedlings and rooted cuttings.

Extension Services: The substation extended her services to Corn in Nasarawa State through the establishment of cashew orchard on model farm.

The substation's Officer-in-Charge and the PAS II took part in the National Cocoa Rehabilitation programme.

Level of Achievements:

(a) Establishment of a 2 hectare cashew plot (2001 planting season).
(b) Maintenance and sustenance of old and new cashew plots in the substation (i.e. 1997/5, 1999/6, 2000/6 Millennium plot).
(c) Establishment of a cashew orchard at Corn in Nasarawa State.

Re-Installation of The Substation's Radio-Phone : The re-installation of the station's radio phone has improved the communication system of the Institute (CRIN).

The Chairman of the Governing Board expressed his congratulatory message over the radio phone to the Headquarters and some other substations during their maiden visit to Ochaja Substation.

Weather Observation:

Below is the rainfall distribution pattern for the period under review January to December, 2001

Month	**No. of Rainy Days**	**Total Rainfall/Month (mm)**
January	1	0.5mm
February	-	-
March	1	-
April	7	132.0
May	12	164.3
June	12	180.9
July	12	76.6
August	9	213.8
September	17	369.5
October	7	50.0
November	-	-
December	-	-
Total	77	1187.60
Average	**9.625**	**148.45**

Revenue Generation: On Table I is the analysis of the revenue generated between January and December, 2001. The total amount realized during the period is Two hundred and fourteen thousand, four hundred and thirty-seven Naira and eighty three kobo (₦214,437.83).

List of visitors to the substation is indicated in Table 2.

Table 1: Revenue Generated, January to December, 2001

No	Particulars	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1	Water supply: Water pump	1,700	10,400	14460	7,000	3,900	-	2800	-	-	-	600	3100	43,960
2	Water supply: Water tanker	1420	400	1100	-	-	-	-	-	-	-	-	-	2,920
3	Cashew Nuts	-	-	37170	5005	100	630	-	-	-	-	-	-	43,505
4	Cashew Sdlins	-	1500	-	200	-	5150	50	700	500	-	-	-	8,100
5	Rent by Cash Book	-	-	100	-	1300	200	200	-	-	-	-	-	1,800
6	Fire Wood	-	-	-	-	1200	-	-	-	-	-	-	-	1,200
7	Rent by Payroll	9,766.19	9,766.19	9,766.19	9,766.19	9108.28	9108.28	9108.28	9108.28	9108.28	9108.28	9448.89	9448.89	112,952.83
Total:		12,886.19	22,06.19	62,596.19	62,596.19	21,971.19	16,208.28	15,088.28	12,158.28	9,808.28	9,608.28	9,448.89	10,048.89	214,437.83

Table 2: List of Visitors to the Sub-station

Date	Name	Address	Purpose
2/01/2002	Mr. T.C.N. Ndubuaku Entomology	CRIN Hgts.	Official Research Work
18/01/2001	Mr. Akin Ayodele (Soil Scientist)	CRIN Hqts.	Official Research Work
18/01/2001	Dr. T.O. Adejumo (Plant Pathologist)	CRIN Hqts.	Official Research Work
15/02/2001	Mr. J.O. Sote (Admin. Officer	CRIN Hqts.	Official Work
15/02/2001	Mr. E.A. Odusote (HEO)	CRIN Hqts.	Official (Personnel Audit)
20/04/2001	O.A. Attah J.P.	Shalom Estate Agbeji	Private
28/04/2001	Mall Y. Danjuma	Kogi State Judiciary	"
08/05/2001	Mr. Edinoh C.K.	Kogi State College of Education Ankpa	"
10/05/2001	Mr. E.A. Ayodele	CRIN Hqts.	Official
16/05/2001	Mr. A.S.B. Akanni	CRIN Hqts.	Official
31/05/2001	Dr. Famaye, A.O.	CRIN Hqts.	Official
31/05/2001	Aliyu, O.M.	CRIN Hqts.	Official
31/05/2001	Adebola, P.O.	CRIN Hqts.	Official
5/06/2001//	Hon. Ochaja U.S.	Omala L.G.A. Abojukolo	
21/06/2001	Chief J.O. Ogunbayo	CRIN Hqts.	Official
21/06/2001	Mr. S.A. Osun	CRIN Hqts.	Official
03/08/2001	J.O. Babafemi	CRIN Hqts.	Official
20/08/2001	E.A. Ayodele	CRIN Hqts.	Official
22/08/2001	Dr. John E. Ogbeide	CRIN Hqts.	Official

Date	Name	Address	Purpose
22/08/2001	All Governing Board Members	CRIN Hqts.	Official
31/08/2001	L.A. Hammed	CRIN Hqts.	Official
31/08/2001	Odiye, R.A.	Abocho	Official
17/09/2001	A.A. Bolarinwa	CRIN Hqts.	Official
27/09/2001	D.S. Ochimana	Chief Magistrate Court Egume	Official
11/10/2001	C.A. Chidi	Kogi State College of Education Ankpa	Supervision of student on SIWES
11/10/2001	D. Idoko	Kogi State College of Education Ankpa	Supervision of student on SIWES
20/10/2001	L.A. Hammed (Agronomist)	CRIN Hqts.	Official, field/researchers duties.
12/12/2001	C.A. Igata	Govt. Sec. Schl. Egume	Familiarization visit.

AJASSOR SUBSTATION (Officer-in-Charge: G. O. Adeyemo)

Staff Strength: The Cocoa Research Institute of Nigeria Ajassor Substation in Etung Local Government Council of Cross River State began the year's activities with 7 Senior members of Staff, 30 junior staff comprising of Agricultural, Artisan and Administrative Cadres.

During the 1st quarter of the year under review 32 casual workers worked at the main station, T.38 and Okondi experimental plots. Casual work force was reduced from 32 to 28 at the beginning of the second quarter. The number of casual workers was however rationalized from 28 to 15 as directed by the Management of the Institute.

Routine activities listed below were covered.

i. Research
ii. General maintenance of plots and quarter environment
iii. Production and Revenue Generation.
iv Weather Records and
v. Extension/Educational Programme.

Research Work: Prompt efforts were focused on regular and adequate data collection on 1967 F3 Amazon Fungicide Trial Experiment, the farming system, Cocoa Rehabilitation (taking place inside experimental II plot), the Tea experimental plot and Meteorological garden.

Data collected from the experimental plots were forwarded to appropriate Research Officers at the CRIN Headquarters, Ibadan.

General Maintenance of Plots, Office And Quarter Environment: Regular cultural activities which included slashing in both cocoa, kola, coffee and tea were undertaken during the period under review. Pruning, removal of mistletoes from cocoa and kola stems, harvesting of matured/ ripe cocoa pods and palm-fruits were equally given the due attention required.

Also during the year, office and residential quarter premises were cleanly maintained. Every Tuesdays of the week, all residents at the CRIN Ajassor substation always came out to observe the general environmental sanitation that usually began by 3.00 p.m. lasting for 2 hours.

I would use this opportunity to remind the Management of CRIN of the promise made to the casual worker in converting some of them to established staff during the official visit to Ajassor Substation by the Governing Board Members in November 1999. In his maiden address to staff and casual workers of the Substation, the Chairman of the Board announced the immediate conversion of 10 casual workers to permanent staff.

The affected casual workers are praying fervently to receiving their appointment letters.

Production and Revenue Generation: The revenue generated in the substation amounted to Five hundred and twenty-two thousand, one hundred and thirteen naira, twenty-seven kobo (N522,113.27) for the year. The break-down of the internally generated revenue could be found over-leaf:-

Weather Records: A total of Six thousand, three hundred and eighty-two point seven milli-meters of rainfall was recorded for the year (6382.7mm).
The break-down of the rainfall for the year is as follows:

1st quarter Rainfall	-	734.6mm
2nd quarter Rainfall	-	2478.5mm
3rd quarter Rainfall	-	2479.5mm
4th quarter Rainfall	-	690.10mm
Total Rainfall	-	6,382.7mm

Revenue Summary for the year 2001

Items	**Jan.**	**Feb.**	**Mar**	**Apr**	**May.**	**Jun.**	**Jul.**	**Aug.**	**Sep.**	**Oct.**	**Nov.**	**Dec**	**Total**
House Rent	4,800	4,800	3,750	225	1,500	750	7,200	825	150	3,675	4,500	675	32,850.00
Cocoa Pods	1,400	-	500	800	6,200	3,200	1,900	500	250	1,400	1,900	13,420	31,970.00
Transport	8,360	7,560	7,180	-	16,630	5,350	10,190	4,900	1,480	3,800	8,350	-	75,800.00
Cocoa Beans	-	-	-	-	-	50,111.27	-	-	-	15,132	-	-	65,273.27
Health Care	-	1,400	700	500	700	-	700	-	-	500	-	-	4,500.00
Timber	-	-	-	-	-	-	-	-	-	1,500	-	-	1,500
Plantain	-	-	-	-	-	-	-	-	-	400	-	-	400
Kola Nuts	2,060	-	-	400	300	-	-	-	-	-	4,400	-	7,160.00
Cocoa Seedlings	17,500	6,000	107,500	52,000	32,000	8,800	12,500	17,280	300	-	8,000	500	262,380.00
Oranges	-	-	-	-	-	-	-	-	-	-	-	2,920	2,920.00
Banana	-	40	-	-	-	-	-	-	-	-	-	-	40.00
Oil Palm/ fruits	-	1,280	3,020	5,040	3,140	3,760	1,100	-	980	-	-	-	18,320.00
Mango	-	-	-	500	-	-	-	-	-	-	-	-	500
Kola Seedlings	-	-	-	-	-	500	-	20,000	-	-	-	-	20,500
	34,120	**21,080**	**122.650**	**59,465**	**60,470**	**73,001.27**	**33,590**	**43,505**	**3,160**	**26,407**	**27,150**	**17,515**	**522,113.27**

Extension Education: Visits were made to cocoa farmers in Effraya – the Etung Local Government Council Headquarters, Bendeghe Ekim, Etomi, Akparabong and Akpabuyo. The farmers were educated on the need to improve on their cocoa farming practices and to imbibe the new cocoa processing technology in order to get good quality beans which would improve the farmers' income.

Also, training workshop was delivered to cocoa farmers from the cocoa growing areas of Cross River and Akwa-Ibom States under the auspices of Cocoa Research Institute of Nigeria and the Federal Government of Nigeria's National Cocoa Development Committee on Cocoa Rehabilitation Programme.

The dividend of the workshop has started yielding positive results. The farmers now come forward with problems facing them on their farms with a view to getting them solved.

It is however suggested that funds be made available so that this kind of workshop could be carried out at regular intervals.

Research Officers of diverse disciplines could be sent to Ajassor Substation with Agricultural Superintendents on extension services.

Visitors To CRIN Ajassor Substation: A number of experienced Agricultural experts both from CRIN Headquarters and within and outside the State visited the Substation.

Chief Paulinus Omeigbe of the High Court, Ikom, Engineer Atta Tangban of Bendeghe Ekim with Dr. O.E. Tangban – a lecturer at the Nigeria Defence Academy, Kaduna came on research work.

Dr. O.L. Idowu – An Assistant Director from CRIN Headquarters came on official assignment.

Chief J.O. Ogunbayo and Mr. S.A. Osun also came to the Substation on "Operation Show Yourself Pay Parade" of the retirees.

Mr. Kolawole Badaru also came on an official assignment on Cocoa Rehabilitation Training Workshop organized for farmers from 30th July to 3rd August, 2001.

The Governor of Cross River State, His Excellency Mr. Donald Duke was at the Substation on the 7th of August to commission a bore-hole project.

During the last quarter of the year, the Acting Director/Chief Executive in company of Messrs Omolaja, Ibiremo and Oloyede were on official assignment to the CRIN Ajassor Substation.