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TRIP REPORT FOR

George Teetes, Allen Kirleis, and Lawrence Busch

June-July, 1980

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Busch left Lexington Sunday morning, June 15, and arrived in Honolulu that evening. Monday June 16 through Wednesday June 18 were spent holding discussions with various members of the East-West Center. At 1:30 on June 16, a seminar was presented to members of the Resource Systems Institute on our research done on American agricultural research. We specifically elaborated upon how similar undertakings could be of benefit to the international centers and national systems, and how our proposed research on ICRISAT would benefit those centers. The rest of the time at the East-West Center was spent in discussions with Dr. Bruce Koppel, Dr. Charles Schlegel, Mr. Ed Oasa and Dr. Saleem Ahmed. As director of the Food Systems program, Dr. Koppel was particularly interested in our proposed research. Their institute has been conducting similar research on the International Rice Research Institute in the Philippines. Mr. Ed Oasa spent the last year at the IRRI examining a wide variety of issues related to the social organization of international agricultural research. His dissertation will be complete soon and will be available to us. Conversations with Dr. Koppel centered around the possibility of coordinating some of the proposed country studies that we intend to engage in with some of those that they wish to engage in. Coordination would be along the lines of insuring data compatibility and comparing observations on particularly effective strategies for international agricultural research. Talks were also held with Dr. Ahmed who has done some work on management development in agriculture in less developed countries and who has spent some time working directly at ICRISAT. On June 19th, Busch left for ICRISAT, arriving on June 21st. Teetes and Kirleis arrived on Monday, June 23rd traveling via Europe. June 24th through June 27th were spent discussing the proposed conference on "Sorghum in the 30s."

Teetes spent one afternoon working with Drs. House and Reddy in the preparation of a sorghum insect identification handbook. The handbook will contain about 150 colored prints depicting insect characteristics and symptoms of damage of approximately 50 insect and mite species associated with sorghum. Narrative descriptions of insects/mites and their nature of damage, biology, and control will accompany the colored pictures.

Teetes spent part of one morning with Dr. House and Sharma discussing the sorghum midge research program of ICRISAT. Among several recommendations, was to concentrate on determining factors that cause the sorghum midge to reach pest density in India, and to work cooperatively with Texas A&M University (INTSORMIL) on the evaluation and development of midge resistant sorghums.

On the afternoon of June 26, Kirleis met with Dr. D.S. Murty, who is in charge of the ICRISAT Sorghum Grain Quality Laboratory. We discussed the Rooney proposed INTSORMIL/ICRISAT Sorghum Quality Workshop program. As a result of this discussion, the attached revised Workshop program should be considered as a three day session to be held following "Sorghum in the 80's" at Hyderabad, India. As all the workshop participants may not be attending "Sorghum in the 80's," there will be a need to find funds to support 2 to 4 key LDC and/or U.S. Scientists for attending the Quality Workshop.

Talks were also held with Dr. Murty and his Laboratory Assistant on their food quality work. Generally most of their quality work deals with identifying grain properties that relate to chapati quality. However, recently they have included work on grain properties related to Ugali (a stiff porridge) quality.

On June 27, Kirleis briefly met with Dr. Jambunathan, ICRISAT Biochemistry Laboratory Head. Currently, they are working with an Instron, in an effort to develop a technique for measuring chapati textural properties and screening sorghum lines for lysine content.

SUMMARY OF SORGHUM IN THE 80'S PLANNING COMMITTEE DISCUSSIONS

Participants:

N.G.P. Rao	L.R. House
K.V. Seshu Reddy	F.R. Bidinger
L.K. Mughogho	G. Tootes
D.L. Oswalt	A. Kirleis
J.M. Peacock	L. Busch

1. There will be two types of invitees - those who will be invited and for whom expenses will be provided and those who will be invited but will be expected to pay their own way.
2. Committee Members will send to L.R. House as soon as possible lists of potential participants in their respective disciplines. These lists will be utilized to compile the final invitation list. For each person, their name, country, discipline, and priority will be included.
3. Copies of all correspondence will go to both House and Busch.
4. ICRISAT will send out initial letters of invitation to presenters. Upon receiving replies, ICRISAT will then notify session coordinators. Session coordinators will then write letters to chairmen, cochairmen, speakers, and discussants, insuring that their presentations hold to the spirit of Sorghum in the 80's. They will also be responsible for seeing to it that each session contains the full complement of participants.

5. Role of Discussants - Discussants will be asked to critically examine projections made, point out those things not covered, and include additional projections.
6. Poster sessions will be encouraged over the presentation of shorter contributed papers. Requests for such will be encouraged informally. Posters/papers will be sent to ICRISAT for consideration for inclusion in the program.

<u>Session Coordinators</u>	<u>Title XII</u>	<u>ICRISAT</u>
Inauguration		L.R. House
I. Setting the scene		L.R. House
II. Physiology		J.M. Peacock
III. Stress		J.M. Peacock
Insect	Teetes	
Path/ <u>Striga</u> /Weeds/Birds		L.K. Mughogho
IV. Genetic Resources		L.R. House/ M.H. Mangesha
V. Breeding		L.R. House
VI. Prod. Tech.		L.R. House
Cropping Systems		
Seed Production		
Mechanization		
Post-harvest		
VII. Food Quality	Kirleis	
IX. Socio-economic	Busch	

PROPOSED TIME TABLE

- 1980
- June 24-26 - Organizing committee meets.
 - July 15 - Letters of invitation sent by ICRISAT including statement of the spirit of the symposium and a copy of the draft program. Letters will note that it is not only necessary to cover the present state of the art but expectations as to what must be done over the next decade.
 - August 30 - Reminder sent to those who have not responded.
 - Sept. 15 - Receive responses (copies to Busch, session organizers).
 - Sept. 30 - Inform section organizers of acceptance and rejections.
 - Oct. 15 - Guidelines to authors sent.
 - Nov. 30 - Replacement participants identified.
 - Dec. 15 - Guidelines to authors sent to replacement.
- 1981
- May 15 - All papers received.
 - June 1 - Papers sent to discussants, section organizer, ICRISAT.
 - Sept. 1 - Discussant papers due at ICRISAT; editor arrives at ICRISAT.
 - Nov. 1 - Conference takes place.

Best Available Document

ESTIMATED BUDGET (\$)

	<u>ICRISAT</u>	<u>AID</u>	<u>INTSORMIL</u>	<u>ICAR</u>	<u>OTHER*</u>
Travel/per diem					
LDC	30,000	40,000		6,000	} 24,000
MDC	24,000		50,000		
On-site expenses	21,000				
Publication/ editor	5,000	5,000			
Translation service		5,000			
TOTALS	<u>90,000</u>	<u>50,000</u>	<u>50,000</u>	<u>6,000</u>	<u>24,000</u>

* includes IRDC, RF, FF, FAO, SAFGRAD, etc.

PROPOSED PROGRAM

DAY I

Inauguration 9:00 - 10:00

Tea 10:00 - 10:30

I. Setting the Scene

Look back 10:30 - 11:00

Production 11:00 - 11:30

Institutional 11:30 - 12:15

Lunch 12:15 - 13:30

Transforming 13:30 - 14:10

Summary 14:10 - 14:40

Discussion 14:40 - 15:10

G. Disc. 15:10 - 15:40

Tea 15:10 - 16:00

II. Plant and Environment 16:00 - 17:00

G.D. 17:00 - 17:30

-- Discussant

DAY II

Session III

Water 8:30 - 9:00

Temperature 9:00 - 9:30

Nutrition 9:30 - 10:15

Tea 10:15 - 10:30

Disc. 10:30 - 11:00

Insect Probs. 11:00 - 11:30

Pest Management 11:30 - 12:30

Disc. 12:30 - 13:00

Lunch 13:00 - 14:00

DAY 2 . contd.. Disease Probs.	14:00	-	14:30
Disease Management	14:30	-	15:10
Discussant	15:10	-	15:40
Tea	15:40	-	16:00
<u>Striga</u>	16:00	-	16:40
Birds	16:40	-	17:00
Disc.	17:00	-	17:15
G.O.	17:15	-	18:15

DAY 3

IV. Resources

Current sit.	8:30	-	9:00
Utilization	9:00	-	9:30
Discussant	9:30	-	10:00
Tea	10:00	-	10:20

V. Breeding

Apomixis	10:20	-	10:40
Cytoplasm	10:40	-	11:00
Temperature	FM	11:00	- 11:30
	NCPR	11:30	- 12:00
Lunch		12:00	- 13:00
Population	VMR	13:00	- 13:30
	BNV	13:30	- 14:00
Disc.		14:00	- 14:30
Gen. Disc.		14:30	- 15:30
Tea		15:30	- 15:50

Stability pap

Short Research Papers	15:50	-	17:30
Banquet - Roy Quilby guest speaker Entertainment	18:30	-	21:00

DAY 4

Field Tour	8:30	-	12:00
Lunch	12:00	-	13:00
Session VI Production			
Cropping Systems	13:00	-	13:30
Crop Management	13:30	-	14:00
Seed production	14:00	-	14:30
Tea	14:30	-	14:50
Mechanization	14:50	-	15:20
Post-harvest	15:20	-	15:50
Discussants	15:50	-	16:20
Gen. Disc.	16:20	-	17:20
Poster Sessions	17:30	-	18:30
Short Research Communications	19:30	-	21:30

DAY 5

Session VII Food Quality

Milling	8:30	-	9:00
Evaluation	9:00	-	9:30
Nutrition	9:30	-	10:00
Tea	10:00	-	10:20
Alternate Uses	10:20	-	10:50
Energy	10:50	-	11:10
Discussants	11:10	-	11:40
Gen. Disc.	11:40	-	12:30
Lunch	12:30	-	13:30

Session VIII Socio-Economic

Farming	13:30	-	14:00
Markets	14:00	-	14:30

Inputs	14:30	-	15:00
Tea	15:00	-	15:20
Research	15:20	-	15:50
Discussant	15:50	-	16:20
Gen. Disc.	16:20	-	17:20
Plenary Session	19:00	-	21:00

SORGHUM IN THE 80's

Draft Program

? NOVEMBER 1981

SUNDAY

PM REGISTRATION AND COCKTAILS

MONDAY

AM-PM INAUGURATION

Chairman: M. S. Swaminathan

Welcome

L.D. Swindale

Objectives of the Symposium

L.R. House

SESSION 1 - SETTING THE SCENE

Chairman: J.S. Kumar
Co-Chairman: A. Karjal

A look back at the 70's

H. Doggett

Status of sorghum production in relation
to other cereals

E.R. Leng

Institutional considerations as related
to sorghum improvement in the 80's

R.W. Carrings

Transforming traditional farming

T. Chhabra
H.C.P. Rao

Summary of the problems

L. ...

Discussants

J.C. Davison
IPAT

TUESDAY

AM SESSION II - SORGHUM AND ITS ENVIRONMENT

Chairman: R.L. Vanderlip
Co-Chairman: EMBRAPA

The plant and environment

G.L. Wilson &
J.L. Eastin
P.H. Soldworthy

SESSION III - FACTORS REDUCING SORGHUM YIELDS

Chairman: J.L. Monteith
Co-Chairman: S. Fukai

Environmental stresses

Water

C.V. Sullivan &
W. Jordan

Temperature

J.P. Peacock

Nutrition (including N fixation)

D. Edwards or
P.J.K. Myers

Minor elements, acidity

E.F. Clark

Discussants

H.C. Turner &
S.K. Sinha

Insects

Chairman: L. Brader
Co-Chairman: J.W. Johnson

Insects problems

J.C. Savies

Insect Pest Management

G.L. Leeton &
R.M. Seshu Reddy

Discussants

W.P. Young &
H.S. Jotwani

PM Diseases, Striga and birds

Chairman: D.N. Srivastava
Co-Chairman: E. Izquierdo

Disease problems

E. Frederiksen

Disease management

C. Parbhoo

Discussant

J.C. Girard

Striga and weeds

K.V. Ramaiah &
C. Parker

Birds

J.S.S. Buesley

Discussant

H. Doggett

WEDNESDAY

AM SESSION IV - GENETIC RESOURCES

Chairman: J. Monyo
Co-Chairman: J.M.J. DeWet

Current situation and future of
sorghum germplasm

M.L. Bengesh &
K.F. Thiruda Rao

Utilization of germplasm in sorghum
improvement program

B. Subramanian

Discussant

S.K. Jain &
Orin Webster

SESSION V - BREEDING FOR IMPROVEMENT

Chairman: H.C. Barber
Co-Chairman: D.L. R. Snow

AM - PM Sterility systems (Apoixis and
cytoplasmic systems)

G.P. Parthy &
Keith Schertz

Temperature - tropical cross selections

Fred Miller &
H.G.P. Rao

Stability and adaptation

S. Herbert

Population breeding techniques

L. P.

Discussants

R.G. Hunzel &
M. Riccelli

THURSDAY

AM Field Tour

PM SESSION VI - PRODUCTION TECHNOLOGY

Chairman: J. Kabore
Co-Chairman: C. Charreau

Cropping systems

P.W. Willey

Crop Management

M.D. Clegg & or
S.P. Singh

Evening Lecture

Roy Quinby

Seed production and distribution

K.P. Chopra &

Mechanisation

Barthe/Senegal

Post harvest technology

D.S. Chung

Discussant

Ch. Krishnamurty &
Bry. D.A. Beck or
F. McQuire

FRIDAY SESSION VII - FOOD QUALITY AND UTILIZATION

Chairman: H. Hulse
Co-Chairman: L.A.V. Dendy

Milling

R. Robert

Evaluation

L.W. Rooney &
D.S. Murty

Nutrition

J.D. Axtell & Futrell

Alternative uses

Perten, Sudan

Energy Sources

R. Schaffert, Lynn
Lynn Gourly
African (C. Charreau)
D. Chapman

Discussant

SESSION VIII - SOCIO-ECONOMIC CONSIDERATION

Chairman: Gaur
Co-Chairman: Dillon

AM

Farming Systems

H.P. Binswanger &
D. Norman

Market System

M. von Oppen &
P.J. Matton

Input Systems

H.P. Arakeri

Research System

L. Busch &
W.F. Lacy

Discussant

J.G. Pagan
David James

SESSION IX - PLENARY SESSION

PM

Chairman: H.R. Akaderi
Co-Chairman: Lampe

Presentation of Sessional Reports

G.E. Sprague

Recommendations

Valedictory speech

A.H. Panting

PROPOSED SORGHUM QUALITY WORKSHOP

I VARIATION IN FOOD QUALITY

(i) Introductory remarks by a knowledgeable specialist on major foods of sorghum - basic differences - importance of consumer quality in human food - problems of extending improved varieties devoid of consumer qualities - need for standardisation of procedures, an assessment of variation and development of suitable techniques.

(ii) Product-wise Reports emphasizing a) detailed procedures b) parameters of distinction, evaluation and consumer importance and c) genetic variability for some of the important parameters.

Evidence should be brought out from literature and, of course, extensively from the 25 samples of ICRISAT.

A. STIFF PORRIDGES

1. Tô (acidic, U.V.)
2. Tô (Basic, Mali)
3. Ugali
4. Sangati (and boiled sorghum after pearling)
5. Ogi (fermented)

Thin porridges of the respective regions could be discussed in passing as there is not much data.

- B. 1. Injera
2. Kisra

- C. Tortilla

- D. Chapati
- E. Cous Cous
- F. Summarisation of physical and chemical properties of the 25 samples - comparison of values - Discussion in relation to the Food Quality ratings obtained.

II MILLING AND PROCESSING

Emphasis on laboratory procedures of dehulling and milling that have a predictive value on traditional performance - includes wet grinding. (details to be worked out by Prof. Rooney).

III FOOD QUALITY ASSESSMENT - METHODOLOGY

- i) Grain color, flour color, food color
- ii) Corneousness, hardness, breaking strength etc.
- iii) Water absorption
- iv) Flour composition (PSI)
- v) Flour solubility
- vi) Composition of starch
amylose, amylopectin etc.
- vii) 'Gels'
- viii) Fermentability of flour
- ix) Taste panels - organoleptic properties - organization - data sheets etc.

Specialist Required
- x) Textural properties of foods -
 - a) Stickiness in porridges

- b) Tearing strength in Chapati, injera, tortilla etc.
- c) Consistency of these porridges.

Instrumentalist Required

- xI) Structure of grain and its bearing on food and processing quality.
- xII) Consumer acceptance - Importance - Rural Economists like Sally Vogel.

IV FOOD INDUSTRY - includes high lysine Foods by JDA
(details to be worked out by Prof. Pooney)

- V i) What does all this mean to the breeder? Should he be concerned? If yes, to what extent?
- ii) Selection Criteria that would be resolved at the moment for each product or a class or set of products.
- III) Any visual methods?
Any information on the stage of breeding program at which the evaluations may be done.
- iv) Any information on heritability etc.
- v) Any quality standards?
- vi) Future research - Collaboration - recommendations.

On June 27, Teetes, Busch, Kirleis, and House met with Dr. J.S. Kanwar, Assistant Director of ICRISAT. We first discussed the proposed conference on Sorghum in the 80s with him. He made several suggestions about the organization and financing of the conference which will be taken into account. He emphasized the importance of keeping costs down and finding additional sources of funds for participant travel.

We briefly discussed the proposed INTSORMIL collaboration and support for the program in Latin America. It was explained that while the INTSORMIL budget does not specifically allow for this kind of regional cooperation, the INTSORMIL mandate does include regional concerns.

The upcoming meeting in Lubbock, Texas was mentioned and Dr. Kanwar, Dr. Swindale, and all members of ICRISAT were invited to attend. It was noted that an official invitation would be forthcoming at a later date.

At that point, the other members of the group left while Busch remained to discuss proposed interviewing at ICRISAT. Dr. Kanwar made it clear that he felt such was inappropriate at this time, though he encouraged working with ICRISAT staff in the Sahel countries.

Teetes and Kirleis departed that afternoon for the states while Busch stayed on to observe the Hyderabad grain market. Busch departed for Geneva on June 29th arriving on June 30th.

On July 1, Busch met with Matthias Stiefel, Solon Barraclough, and Pierre Spitz of the United Nations Research Institute for Social Development. They currently have two projects underway which are related to our proposed research as part of INTSORMIL. One project concerns improving popular participation in development and includes participation as related to the creation and diffusion of the products of science and technology. Currently the participation program is establishing research

work groups including individuals not directly tied to or financed through the project. It appears feasible and desirable for us to link up with this research network. The other project of interest to INTSORMIL is the Food Systems Project. Pierre Spitz is heading this project and is currently doing field work on food systems in West Bengal, India. Specifically, they are interested in identifying individual and communal responses to food scarcity and famine with an eye to minimizing such problems in the future. It was agreed that an exchange of information and publications between our two organizations would be desirable.

Busch returned to the US via London on July 2.