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**PORTUGAL UNIVERSITY
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DEVELOPMENT PROJECT**

(Contract AID/NE-C-1701)

**REPORT ON
SHORT-TERM STAFF ASSIGNMENT**

**Submitted by
DR. JULES JANICK
Department of Horticulture
Purdue University**

May 11 - June 9, 1983

PORTUGAL UNIVERSITY INSTITUTES DEVELOPMENT PROJECT
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SHORT-TERM STAFF ASSIGNMENT

at the
Universidade de Evora
Evora, Portugal

May 11 - June 9, 1983

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West Lafayette, Indiana

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I wish to acknowledge the assistance and encouragement of the staff of the University of Evora with special commendation for Dr. Carlos Portas, who was my counterpart, for his support in making this tour of duty a productive and pleasant experience.

REPORT ON SHORT-TERM STAFF ASSIGNMENT

Submitted by
Dr. Jules Janick
Purdue University

This document is the final report of Dr. Jules Janick, Professor of Horticulture, Department of Horticulture, Purdue University, who served as a short-term advisor to the University of Evora, Portugal, under the terms of an Agency for International Development contract administered through Purdue University. This visit was a follow-up of the tour in September - October 1981 (refer to 1981 report).

My Portuguese counterpart was Dr. Carlos Portas, but I also worked closely with Eng. Joao Antero Araujo and Eng. Antonio Manuel Calado as well as Eng. Antonio Almeida Monteiro of the University of Lisbon who is a doctoral student of Dr. Portas.

I advised the University of Evora in the area of horticultural production systems. There were five project aims:

- 1) Investigate the potential for horticultural research in Portugal with emphasis on the Alentejo
- 2) Coordinate a joint research paper on the green oak (*Quercus rotundifolia*)
- 3) Introduce new germplasm (bean, tomato, jojoba)
- 4) Discuss coordination of GTZ and AID research programs
- 5) Present seminars

1. HORTICULTURE AND THE ALENTEJO

The Alentejo is known for dryland grains (principally wheat, barley, and oat), grazing (cattle, sheep, goats, swine), and the exploitation of stands of olive, cork oak, and green oak. It is not a traditional horticultural area despite the fact that each house and village has its local garden and orchard. The horticultural areas of Portugal are to be found along the Atlantic dominated climates of the litoral coasts North of Lisbon, the Douro valley, and the Algarve. The traditional agriculture of the Alentejo is characterized by low production due to marginal rainfall pattern and poor soils. Yet one cannot deny the rugged beauty of the landscape and the stability of the traditional agricultural system. At no time is this more evident than in the spring (especially their unusually late spring of 1983--extending into June! with unseasonable rains during April and May that have caused an explosion of gorgeous hues--yellow, red, and purple).

The great agricultural controversy of the Alentejo involves a technical question over the balance between pasture and grain and the social consequences of land policy. The issues are ancient ones and enormously complicated.

1. Portugal is a grain-deficient country and yearns to be self-sufficient, hence national policy for most of this century has encouraged grain production.

2. The traditional wine interest centered in the Douro valley has discouraged competing wine industry in the Alentejo (it is presently illegal to plant new grapes in the Alentejo--a policy that dates back to the Marquis of Pombal).

3. Large land holdings, a consequence of a traditional "hacienda" system of production favoring low capital investment, low productivity, and extensive holdings.

4. The traditional "ecology" policy which resists any change in the natural landscape (it is illegal to remove cork or green oaks without permission).

As a result, the present agricultural system is a middle course between grazing and intensive agriculture. It has resulted in an agricultural system which features grain production rather than permanent pasture. It may be that this policy has been incorrect and is responsible for "the worst of all possible worlds"!

1. Low grain production
2. Ecological damage to grain farming caused by excessive tillage
3. Low meat production
4. Low agricultural productivity in general and low regional development

It may be that the correct solution may be on the one hand to increase agricultural production via permanent pastures--more intensely grazed, and on the other hand to increase agriculture production based on intensive cropping via horticulture (grapes, fruit trees, vegetable crops) in pockets of suitable soils rather than via extensive cereal production.

Evidence for the feasibility of the horticultural approach is as follows:

1. Grape production: Alentejo wines are excellent but supply is too small for export. Dryland grapes do well in the Alentejo and appear a profitable alternative. There is potential for increased export of good quality wines.

2. Fruit production: The remarkable success of the Monte Branco apple orchard (1000 ha planned, 500 ha in production) indicates that commercial orchards are feasible with suitable technology. In this case, the key factor has been exploitation of the Guadiana river water for irrigation using trickle irrigation.

3. Vegetable production: Small pockets of intensive production (onions, melons) indicates that commercial vegetable production should find a niche.

The key to the systems must be more efficient use of water resources. A system of small dams, ponds, and effective use of irrigation--probably by trickle irrigation systems appear to me to be the most efficient course of development. Thus, I recommend that research on trickle irrigation should be given the highest priority. I have recommended that Antonio Calado pursue this course for his doctorate research. Other fields that should be pursued include grape production (both wine and table grapes) especially for the Alentejo, and finally tree fruit production with emphasis on Prunus--almond, apricot, plum, nectarine and peach.

2. GREEN OAK PAPER

I have assisted in the coordination of a joint paper on the green oak. A rough draft has been prepared with the cooperation of Dr. Carlos Portas, Afonso de Almeida and Francisco Colaco do Rosario. This paper is being prepared for Economic Botany and hopefully will encourage future cooperation between plant and animal scientists.

3. NEW GERMLASM

During my last trip, I was instrumental in obtaining interest in the introduction of blueberries as a new crop for the acid soils of the North.

A small planting of blueberries is under observation at Vila Real under the supervision of Alberto Santos. During this trip I have distributed seeds of three species as follows:

1) Dry beans suitable for canning. An observation trail will be set in cooperation with Antonio Calado of the University of Evora and Tocan, Sociedade de Tomate de Canha (Fernando M.L. Penha Pereira). Cultivars included are: Neptune, Seafarer, Sanilac, Kentwood, Nep-2, Admiral, Swan Valley, Tuscola, Fleetwood, Ex Rico, Great Northern VI 59, Aurora, Great Northern Emerson, Pinto VI III, Great Northern Harris.

2) New tomato germplasm was turned over to Antonio Calado: Purdue University 812 (jointless) whole pack processing type; 'Caro Red' (High beta carotene); Nor hybrid (nor/+) in 'Walter'; nor u homozygotes in 'Heinz 1350'; and Purdue University 74-32, hp og^c, a high pigment, crimson type.

3) Jojoba seed sufficient to plant 1 hectare was made available to Antonio Almeida Monteiro and the GTZ program in the Algarve.

4. GTZ AND AID COOPERATION

I have encouraged Antonio Calado to develop a cooperative program on the technological and economic implications of trickle irrigation to the Alentejo with the GTZ (contact, Herbert Albrecht). Hopefully, this study will provide research for a doctoral thesis for Calado. I feel this study could have enormous research implications for the Alentejo.

Finally, I hope to develop continued support for joint future research with the GTZ and AID in the Algarve. The introduction of jojoba seed is the first step in this effort.

5. SEMINARS

Two seminars were presented during this tour.

- Tissue Culture, June 1, 1983, Mitra, University of Evora
- Tissue Culture and Crop Improvement, June 8, 1983, National Fruit Station at Alcobaca.

GENERAL OBSERVATIONS

The transfer of Dr. Carlos Portas to Lisbon will create a vacuum in horticultural research at the University of Evora. I feel it imperative to utilize this move as an opportunity rather than a loss. In this respect, I wish to recommend that the University redouble its effort to direct horticultural research to the specific problems of the Alentejo. Perhaps a program aimed at improved irrigation techniques, particularly trickle irrigation which is suitable for small areas and dryland conditions will be a key factor. Further, I recommend that efforts accentuating fruit trees and grapes for this region be emphasized. A cooperative program of trickle irrigation with Prunus production and table grapes should be feasible with present personnel, specifically Antonio Calado and Joao Araujo, but increased research should be encouraged with new assistant professors.

DIARY

- Wednesday, May 11, 1983 - Left New York TAP flight 315
- Thursday, May 12, 1983 - Arrived in Lisbon after a stop at the Azores (Terceira)
Met by João Araujo. Met Dr. Carlos Portas, Dr. Edward Carter, Pedro Silveira, and Ant6nio Almeida Monteiro at a meeting of the Portuguese Horticultural Society.
Discussed final report of AID consultant Carter.
- Friday, May 13, 1983 - Orientation meeting at USAID with Charles Buchanan, Jos6 Pinheiro, and Michael Lukomski. Arrived in 6vora (Mitra); met Howard Taylor and discussed his visit.
- Saturday, May 14, 1983 - Excursion to Vila Viçosa with Howard Taylor meeting with Dr. Carlos Portas. Visited marble industry, Vila Viçosa castle.
- Sunday, May 15, 1983 - In 6vora, visited garden at the Convento with Taylor, visited Valverde, nearby village, children's folklore competition at 6vora, attended Portuguese bullfight at 6vora.
- Monday, May 16, 1983 - In 6vora. Discussed doctoral theses (2) of Araujo (Contribution on the wine characterization (ampelographica) of the grape wines cultivated in Alentejo; Studies on the phenology of the grape). We discussed possibility of a rapid method to characterize grape cultivars based on 2 parameters of leaf morphology. Visited Mitra including research laboratories of the Department of Plant Science, library, and rhizotron (with Maria do Ros6rio Oliveira).
- Tuesday May 17, 1983 - In 6vora. Prepared inventory of germplasm, inventory of greenhouse technicians, developed a system to classify grapes by leaf shape. Meeting with Dr. Carlos Portas, Afonso de Almeida, Francisco Colaço do Ros6rio to coordinate a paper on "Acorns of the Alentejo" destined for Economic Botany to include historical aspects, botany, ecology, legal issues, uses industrialization, and potential. Dinner meeting with Portas and Araujo.

- Wednesday, May 18, 1983 - Meeting with Portas to discuss problems of department and horticultural research in Alentejo. Dr. Portas advised me that he will join the faculty of the University of Lisbon. Delivered tomato seed to Calado.
- Thursday, May 19, 1983 - Visited Coruche with Antonio Calado. Met Victor Dias, Cooperativa do Sorraia, and visited peach plantings under trickle irrigation. Visited Department of Agriculture at Vila Franca de Xira and toured trials of melons with Francisco Caldeira.
- Friday, May 20, 1983 - Visited largest apple orchard (Monte Branco) in Europe (1000 ha) with Araujo and student (João Manuel Mata Barroso) at Juromenha. A Dutch company is exporting 'Granny Smith' apples the first to mature in Europe. Also 'Golden Delicious' 'Ozark Beauty' 'Starkrimson', many pear cultivars, a few peaches. The largest and one of the most modern orchards I have ever seen. All irrigated by trickle from the Guadiana river. (Thil Lda., Elvas, Tel. 1045, Telex 12000). Storage capacity of 1000 tons.
- Saturday, May 21, 1983 - In Évora, visited city.
- Sunday, May 22, 1983 - In Évora, visited "Anta" paleolithic ruins next to Mitra. Waited for Tom Gunter who was to arrive but failed to appear.
- Monday, May 23, 1983 - To Aveiro via Lisbon with Portas and Calado. En route visited new greenhouse at the University of Lisbon.
- Tuesday, May 24, 1983 - Attended National Colloquium on the Production of Potato. Discussed potato seed production with Dr. Van der Zaag, invited speaker from Holland. Discussed thesis problem (Technological and Economic Problems of Trickle Irrigation) with Calado.
- Wednesday, May 25, 1983 - In Aveiro, Colloquium. Discussed seed potato problem with Dr. Jurgens Carls, GTZ.
- Thursday, May 26, 1983 - In Aveiro, Colloquium.

Telephone conversation with Alberto Santos, Vila Real, concerning blueberries sent to Portugal as a result of my previous trip. Some plants survived and are fruiting this year. Field trip to visit potato trials.

- Friday, May 27, 1983 - Returned to Évora. Visited Tomar en route.
- Saturday, May 28, 1983 - In Évora. Student "bullfight" in Évora (Garraiada).
- Sunday, May 29, 1983 - Toured Beja with Howard Taylor. Visited UCP (collective farm) of Aguiar, saw 3 ha of plastic greenhouse with almost total crop failure. Collected soil samples (pH 5.0 water; 4.5 KCl) indicating probable cause was toxic reaction, perhaps by ammonium sulfate? Visited Viana do Alentejo. Visited local farms and saw melon production in plastic tunnels (Beja).
- Monday, May 30, 1983 - In Évora. Discussed visit and plans with Tom Gunter, chief of Party at Covilhã.
- Tuesday, May 31, 1983 - In Évora. Meeting with Herbert Albrecht, GTZ to discuss research cooperation with AID.
Meeting with Maria Ivone Henriques to give editorial advise on virus paper.
Meeting with Carlos Portas, Afonso de Almeida, and Francisco Colaço do Rosario to discuss first draft of "Acorn" paper (refer May 17).
Meeting with Antonio Almeida Monteiro to discuss visit to Algarve.
Meeting with Antonio Calado to discuss his research with trickle irrigation, visited present irrigation studies at Mitra.
Dinner meeting with Herbert Albrecht.
- Wednesday, June 1, 1983 - Visit to Tocan at Taipadas with António Calado to set up program of bean trials. Delivered seed to Fernando M.L. Penha Pereira.
Delivered seminar on tissue culture at Mitra.
Discussed rapid method of classifying grape leaves with Araujo and possibility of preparing short paper.

- Thursday, June 2, 1983 - In Évora. Holiday.
Wrote draft of final report.
- Friday, June 3, 1983 - Discussion with Calado on paper of his tomato
research.
To Algarve with Antonio Almeida Monteiro.
- Saturday, June 4, 1983 - In Algarve, visited greenhouse industry, table
grape industry.
- Sunday, June 5, 1983 - In Algarve.
- Monday, June 6, 1983 - Visit GTZ project at Algarve, Nursery at S. Bartolomeu de
Messines (Andrew Henley-Welch), return to Évora.
- Tuesday, June 7, 1983 - Final visits at Évora.
To Lisbon for meeting with Buchanan, AID.
Visit greenhouses with Buchanan.
- Wednesday, June 8, 1983 - Trip to Alcobaca Fruit Station, seminar on
tissue culture and fruit breeding.
Return to Lisbon.
- Thursday, June 9, 1983 - To New York on TAP flight 312 and proceed to Indianapolis,
and Lafayette.