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Consultant final Report
IICA/EMBRAPA-PROCENSUL II
RESEARCH ON PROCESSING TOMATO IN BRAZIL

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Consultant final Report
IICA/EMBRAPA-PROCENSUL II

RESEARCH ON PROCESSING TOMATO IN BRAZIL

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N RESEARCH ON PROCESSING TOMATO IN BRAZIL

Consultant Progress Report
IICA/EMBRAPA-PROCENSUL II

Edward C. Tigchelaar ✓

Brasília, agosto de 1989

INSTITUTO INTERAMERICANO DE COOPERAÇÃO PARA A AGRICULTURA
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APRESENTAÇÃO

A reprodução e difusão dos Relatórios de Consultores, no âmbito restrito das Diretorias das Unidades do Sistema Nacional de Pesquisa Agropecuária, vinculado à EMBRAPA, tem como objetivo principal o de divulgar as atividades desenvolvidas pelos consultores e as opiniões e recomendações geradas sobre os problemas de interesse para a pesquisa agropecuária.

As atividades de consultoria são realizadas no âmbito do Projeto de Desenvolvimento da Pesquisa Agropecuária e Difusão de Tecnologia na Região Centro-Sul do Brasil - PROCENSUL II, financiado parcialmente pelo Banco Interamericano de Desenvolvimento - BID e a EMBRAPA conforme os contratos de Empréstimo 139/IC-BR e 760/SF-BR, assinados em 14 de março de 1985 entre o Governo Brasileiro e o BID.

As opiniões dos consultores são inteiramente pessoais e não refletem, necessariamente, o ponto de vista do IICA ou da EMBRAPA.

A coordenação dos Contratos IICA/EMBRAPA agradecerá receber comentários sobre estes relatórios.



Horacio H. Stacho
Coordenador Contratos IICA/EMBRAPA



INTER-AMERICAN INSTITUTE FOR COOPERATION ON AGRICULTURE
IICA/EMBRAPA CONTRACT

CONSULTANT FINAL REPORT

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2. Specialist in: *"Melhoramento Genético do Tomateiro"*
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**OBSERVATIONS AND RECOMMENDATIONS
ON RESEARCH ON PROCESSING TOMATO
PRODUCTION IN BRASIL**

A report submitted to the
**Instituto Interamericano de Cooperacao para a
Agricultura**
and
Empresa Brasileira de Pesquisa Agropecuaria
Ministerio de Agricultura, Brasilia, D.F.

by
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August, 1989

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The author also wishes to express a special word of thanks to my "travelling companions" in Northeastern Brasil (Joao Eustaquio Cabral de Miranda, Lineu Amaro Rodrigues, Edinaldo Ferraz and motorista "Luiz") for many pleasant hours of observation and discussion. Finally, "muito obrigado" to the many people from both the public and private sectors who provided us with an opportunity to observe the diversity within the processing tomato industry and for providing views and/or opinions which were critical to this evaluation.

1.0 INTRODUCTION

This report contains observations of field production practices of the processing tomato industry in Northeastern Brasil and of public research which is being carried out at the Belem de Sao Francisco Experimental Station; at CPATSA in Petrolina; and at CNPH (Brasilia) to address the needs of this rapidly expanding industry. My visit was scheduled to coincide with the peak of the processing tomato production season in the Northeast and also the 29th Annual Meeting of the Brazilian Vegetable Crops Society (S.O.B.) held in Recife, Pe. Ironically, my visit also coincided with the 20th anniversary of our departure from Brasil following a 2 year assignment at the Federal University of Vicoso from 1967-69. This assignment was followed by several short term assignments in Brasil largely dealing with the vegetable processing industry. As a result, this report will include an "historical perspective" of this industry based upon recollections and reports of prior visits during the 1970s and early 1980s.

The author's 2 week stay in Brasil was funded through the Instituto Interamericano de Cooperacao para a Agricultura (IICA) for the Empresa Brasileira de Pesquisa Agropecuaria (EMBRAPA) through the Centro Nacional de Pesquisa de Hortaliças (CNPH) located in Brasilia. Visits were also made to observe research at the Centro de Pesquisa Agropecuaria do Tropicó Semiarido (CPATSA) and the Pernambuco State Experimental Station (IPA) located at Belem de Sao Francisco. The major objectives of this assignment were as follows:

1. Participate in the 29th Annual Brazilian Vegetable Crops Society Meeting; meet with Brazilian tomato researchers, and present a talk on the topic "Breeding Tomatoes for Industrial Uses".
2. Visit with tomato growers and processors to observe the status of production technology in Northeastern Brasil and attempt to develop some ranking of research needs and priorities.
3. Review processing tomato research (with special emphasis on tomato breeding) and evaluate existing tomato breeding research and research organization.

2.0 EXECUTIVE SUMMARY

The agricultural changes of the past 15 years in Northeastern Brasil, and in particular, the development of a significant "food processing industry" in this area, has been truly remarkable. The opportunity to visit this area and observe the dramatic changes which have taken place in the 17 years since my original visit in 1972 (and a subsequent visit in 1975!) was most gratifying.

This report presents a summary of observations made from visits to a sampling of farms, processing plants and research facilities in the region to attempt to assess the adequacy of research to support and sustain the rapidly expanding processing tomato industry. As might be expected, this "new industry" is experiencing "growing pains" (some of them severe!) and is seeking public research assistance to find solutions to the unique problems of this region.

A processing tomato breeding program initiated in the mid 1970s by IPA at the Belem de Sao Francisco Experiment Station appears to have played a major role in the early expansion of this industry. The development of several varieties (IPA 5, IPA 6 and IPA 7) which have proven widely adapted to the region has created excellent visibility for this research effort. Processing tomato research to date appears to have stressed variety development; breeding goals and objectives need to be re-evaluated to focus on priority problems of this industry. Research on crop culture and management and crop diversification has been limited and needs to be expanded.

Part 3 of this report presents a general overview of activities and observations from visits to a sampling of tomato farms in the Pesqueira, Florestas, and Petrolina/Juazeiro regions. Part 4 presents a brief discussion of tomato research programs and Part 5 attempts to recommend research areas which should be given high priority in future years.

In order to build a strong and relevant public research and grower education effort on processing crops, the processing industries must join forces to help prioritize research needs and develop a stable and long term funding base for needed public research.

3.0 DETAILS OF ACTIVITIES

3.1 Participation in the 29th Annual Brazilian Vegetable Crops Society (S.O.B.) Meetings (July 17-19, 1989).

A seminar was presented during the 1989 SOB meetings on the topic "Breeding Tomatoes for Processing Uses". This seminar was followed by a brief discussion of the role of variety and crop management on the unique quality requirements for different processed tomato products.

An informal round table discussion was held on July 19 at which time most researchers involved in tomato breeding research throughout Brasil participated. This meeting proved to be particularly beneficial, since it provided me with an overview of tomato improvement efforts throughout the country. The vast majority of public research on tomato breeding is focused on development of "varieties for fresh market use". Processing tomato breeding appears to be restricted to the IPA/CNPH program and possibly some limited activity by the processing industries (CICA?). IPA 5 and several imported varieties (UC 82, Rio Fuego, Rio Grande, Petomech. Peto 1401 F2 etc.) appear to be the major varieties used by the processing industries in Northeastern Brasil. Greater exchange of information and breeding materials should be encouraged by public sector researchers.

RECOMMENDATION: A forum should be developed (similar to the Tomato Breeders Roundtable or Crop Advisory Committees in North America) to encourage discussion and broader communication and cooperation among researchers working on specific crop commodities.

3.2 July 19, 1989 Meeting with Director of IPA, Dr Manuel Abelho

Met briefly to get an historical overview of changes that have taken place in the San Francisco River Valley since my first visit there in 1972.

3.3 July 20, 1989: Visit to Fabrica "Peixe" in Pesqueira, Pe. and to surrounding production fields accompanied by Dr Jose Dubeux Neves, Northeastern Director for Peixe, and local agronomos.

The Peixe plant at Pesqueira was the first company in Brasil to process and market processed tomato products. This plant currently receives part of its annual supply of "raw product" from "rainfed acreage" produced on many small farms in the Pesqueira region. Additional raw product is produced to the west of Pesqueira under irrigation projects developed by CODEVASF. Soils in the Pesqueira region are very shallow and the topography quite irregular (very similar, in fact, to the processing tomato producing regions I have visited in Japan!). Peixe has developed an appropriate technology for tomato production in this region and is the only processor in Brasil producing in this region. Several diseases occur regularly in this region ((Late blight; *Phytophthora infestans*, Southern Blight; *Sclerotinia rolfsii* and soil rot (unknown spp)) which are not normally found in the drier regions of western Pernambuco. Use of plastic mulches should be examined in this region as a means for conserving soil moisture and to reduce "soil rots" which may cause extensive losses.

Improvements in quality of the processed products has been remarkable since my visit to this area in 1975. Peixe is currently competing in world markets for tomato based products as well as certain processed fruit and fruit based products. This is probably due to improvements in both raw product quality and improved processing technologies.

3.4 Friday, July 21: Visit to Belem de Sao Francisco Experimental Station to observe tomato research plantings Edinardo Ferraz: Director

Observed tomato breeding plots and sample plantings of varieties (IPA5, 6 and 7) which have been developed from the Belem de Sao Francisco breeding program which was initiated in approximately 1973. These varieties perform well in this region and have been a valuable contribution to the tomato processing industry in the Northeast!

I was also impressed by the dramatic improvements in crop culture and management which have also taken place at the Station since my visit in 1972. Outstanding yields were being produced in several of the experimental tomato areas. Such well conducted trials document what is possible in the region by combining good genetics with good management! In addition, they provide excellent visibility and credibility for public research programs. This effort should get more visibility, however location (an isolated island!) is a disadvantage.

3.5 July 21 (Cont.): Visit to Projeto Mandaracu near Florestas, Pe.

This irrigation project is located east of Belem de Sao Francisco near the town of Florestas. The project is made up of a number of small farms (6-10 Ha/farm) under sprinkler irrigation. Processing tomatoes are an important crop for "colonos"; the Peixe plant in Pesqueira is the end user of tomatoes produced in this area. Culture and management of the crop appears to be largely manual but, at this stage of crop development (first inflorescence!), progress appears good. Soils in this area are very shallow, requiring frequent irrigation. Agronomos from the processing plant provide technical assistance to growers in each of the "colonos".

Visited the farm of Martin Mason, an American from California, who is currently producing processing tomatoes and other crops approximately 20 Km east of Petrolina. Irrigation all gravity flow with water applied every other day due to low water holding capacity and shallow soils. Crop prospects looked fair to good!

3.6 Saturday, July 22: Visits to large scale tomato producers in the Petrolina area.

A major expansion in irrigated vegetable acreage has occurred in the Juazeiro/Petrolina area with the widespread introduction of center pivot irrigation systems. Three large farms with processing tomato acreage under center pivot irrigation where visited. An excellent crop potential (estimate 60-65T/Ha) was evident on the first farm; the second farm was quite variable with very good and very poor sections. Variability appeared to be largely due to poor fertilizer placement at the time of planting and/or sidedressing. Some moisture stress was also noted on knolls where soils are apparently very coarse and light. Moisture stress and moderate "pinworm" (traca) seemed to be the major factors limiting yields on the 3rd farm visited.

Figures we were given on use of different irrigation methods in the area are as follows:

Center Pivot----- appr. 20%
Portable Sprinklers----- appr. 40%
Gravity (Furrow) ----- appr. 40%

3.7 Sunday, July 22: Visit to "Barragem Sobredinho" to observe the water source for the agricultural projects in the Sao Francisco River Valley.

A "water wonderland" in the middle of the Sertao! Most impressive!

3.8 Monday, July 23: Visit to CICA Research Area and Commercial Plantings in Juazeiro, Bahia.

Plots included variety trials, fertilizer studies, and tomato breeding plots. Quite impressive! For some reason, field researchers in Brasil have been taught that each experimental unit should be 3 rows with the middle row only serving for experimental measurements. This statistical precision is unnecessary in variety trial plots and greatly increases the workload involved in carrying out such studies. Single row plots are more than adequate for most variety testing situations.

Observed seeding equipment manufactured by CICA in operation. Seed use is still high (2.5-3.0 kg/ha) and fertilizer and seed placement not as precise as I would like to see. Current equipment is designed to make the bed and seed in one operation. I personally feel it would be preferable to perform each of these steps as separate operations to achieve a higher degree of precision and reduce seed use.

Visit to Frutiville in Juazeiro, Bahia

Visited tomato plantings and observed plantings of several other crops (passion fruit, figs, grapes and guava). Tomatoes under center pivot but trickle being tried on other experimental crops. Tomato potential fair to poor due largely to moisture stress and poor vegetative development (UC82). Severe "traca" as well!

Visit to Projeto Nilo Coelho in Petrolina, Pe.

Observed very severe cases of "traca" (*Scrobipalpa absoluta*) on several farms in this project. The problem is clearly being aggravated by the close proximity of fields at widely different stages of crop development and a resulting "building up" of very large populations of the pest. In addition, tomato producers frequently abandon fields after the first or second harvest creating a reservoir of various pests. NOTE: Plowing under of crop refuse immediately after the final harvest should be a standard practice for all crops to minimize future insect, disease and weed problems. Failure to adopt this practice may contribute to serious future problems in pest control in the area! This practice is not only important for the control of 'traca' but also to prevent other problems (eg. nutsedge) from building up in the future!

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Haji, Francisca N.P., José P. Araujo, Otávio Nakano, João P. Silva and João C. Toscano, 1986.

Controle químico da traca do tomateiro (*Scrobipalpa absoluta*) no submedio Sao Francisco. An. Soc. Entomol. Brasil, 15: 71-80.

Haji F.N.P., Carlos A. de Vasconcelos, Oliveira, M. da Silva Amorim Neto and J.G. de Sordi Batista, 1988.

Flutuação populacional da traca do tomateiro no submedio Sao Francisco.
Pesq. Agropec. Bras. 23: (1); 7-14

Incidence of this pest appears to be under fairly good control on large plantings where conscientious chemical control has been practiced. Severe buildup seems to be limited to situations where population levels have been allowed to buildup or movement has occurred from neighboring fields. Managing this pest on the small scale plantings on the "irrigation projects" would appear to be a particular challenge which will require careful monitoring of planting dates, populations, and control strategies. Research workers at CPATSA have studied the biology of this "new pest" and have identified those chemicals which provide effective control (See references below). Cases of failure to achieve effective control appear to result from use of ineffective materials and/or movement from areas in which control has not been practiced (abandoned fields or fields at the end of the harvest cycle!)

Tuesday, July 24: Seminar/Discussion at CPATSA with Research Staff and Processing Industry Group. Approximately 30 technicians representing both public and private sectors were in attendance.

: Observed Processing Tomato Breeding plots at CPATSA (with Joao Eustaquio Cabral de Miranda, Jose Pires de Araujo and Rosita de Cassias Souza Dias). Trial involves an evaluation of F2 populations derived from selected F1s.

: Travel by car from Petrolina to Salvador, Bahia.

Wednesday, July 25: Salvador to Brasilia: Met with Horacio H. Stagnio, Coordenador de Contratos, IICA/ EMBRAPA.

Thursday, July 26: Tour of research and research facilities at CNPH/EMBRAPA.

Friday, July 27: Visited CNPH research facilities assigned to the tomato breeding project. Spotted wilt very severe in field plots and precluded any evaluation of research.

Presented seminar to CNPH staff on genetics of tomato fruit ripening and use of male sterility to produce F1 hybrids.

Meeting with Dr Rafael Eurides Jabuonski (Chefe do CNPH) and Dr Francisco J.B. Reifschneider (Technical Director of CNPH) to discuss observations of the CNPH/EMBRAPA tomato breeding program.

Met with Marina Castello Branco (Entomologist) to discuss her research to introgress resistance to *Scrobipalpa* found in *L. pennellii* (LA 716) and *L. hirsutum* (PI 134417 and PI 127826) into *L. esculentum*.

4.0 DISCUSSION

4.1 The Tomato Processing Industry in Brasil: has experienced major changes during the past 20 years. It has evolved from an industry (largely based in Sao Paulo) which served a limited national marketplace in the late 1960s to one which is attempting to compete in the world marketplace in the late 1980s. The rapid growth of this industry has been fostered by a growing national and international demand for processed tomato products and, undoubtedly, by the arrival of "the supermarket" in Brasil.

The expansion of processing tomato production in Northeastern Brasil has taken place largely during the past decade! The very rapid expansion into this area has been fostered by the climatic advantages of the region, development of large irrigation projects which would support this industry and fiscal incentives to industries willing to locate in this region. In 1973, a small public research effort was also initiated by Empresa Pernambucana de Pesquisa Agropecuaria (IPA) to develop and/or identify tomato varieties adapted to the region and examine cultural requirements in the region. This research presumably contributed to the very rapid expansion of processing tomato production in the region in the 1980s. Estimates of 1988 processing tomato production in the states of Pernambuco and Bahia indicate a production of approximately 475,000 tons on approximately 12,000 hectares. Reported collective factory capacity is estimated to be approximately 4000 tons per day with future expansion expected to further increase this daily capacity.

4.2 Tomato Breeding and Variety Testing:

The processing tomato breeding program initiated by IPA in 1973 with cooperation from various other public agencies has obviously made important contributions to the expansion of processing tomato production in the Northeast. Inbred varieties developed from this program (IPA 5, 6 and 7) have occupied a significant share of acreage and continue to be widely grown.

The current processing tomato breeding program needs to be refocused to address some of the high priority problems that exist within the region. This refocusing is also important in light of the rapid shift to F1 hybrids that is occurring in other regions of the world.

Short term goals should include development of inbred varieties incorporating needed disease resistances (V, F1, F2, Sm, and nematode resistance) with adequate cover, good fruit set and firmness and moderate soluble solids. I personally believe that the use of F2 varieties will be a very temporary situation and research on F2 varieties should be limited to very specific resistance situations.

Medium term goals should focus on combining desired pest resistances with improved processing quality (soluble solids, firmness and peeling quality). Use of F1 hybrids should be explored in the region if seed costs and seed usage can be reduced substantially. F1 hybrids offer definite yield (and potential quality) advantages versus inbred varieties and should be carefully explored. We would be happy to share our "male sterile" germplasm for F1 hybrid studies.

Long term goals should explore the use of host resistance to facilitate control of serious pest problems, particularly "spotted wilt virus" which may be a devastating disease in southern and central Brasil, and tomato leafminer (*Scrobipalpa absoluta*) which is causing serious losses in the Northeast. Introgression of resistance to spotted wilt from *L. hirsutum* is being studied by Maluf and tolerance to *Scrobipalpa absoluta* from *L. pennellii* and *L. hirsutum* is being introgressed into *L. esculentum* at CNPH by Marina Castello Branco. Close cooperation should be developed with these programs and, if feasible, results of this research should be integrated as quickly as possible into the current tomato breeding program.

4.3 Research in crop culture and management:

The rapidly expanding tomato processing industry will require continued improvements in the volume and quality of the raw product needed to support the processing industries. I personally feel that a major increase in research on crop culture and management is needed to complement the breeding programs.

A long term research effort is required to explore options in crop culture and management (particularly land preparation and use, crop diversification, water and soil management under different irrigation systems, and optimal strategies for integrated pest control).

EMBRAPA and the Food Processing industries should assume leading roles in providing the infrastructure and creating the knowledge base needed to ensure continued growth by this industry. Orderly future growth of this industry will require that industries join forces to support public research and education to solve future growth problems and further improve product quality and production efficiency of this crop.

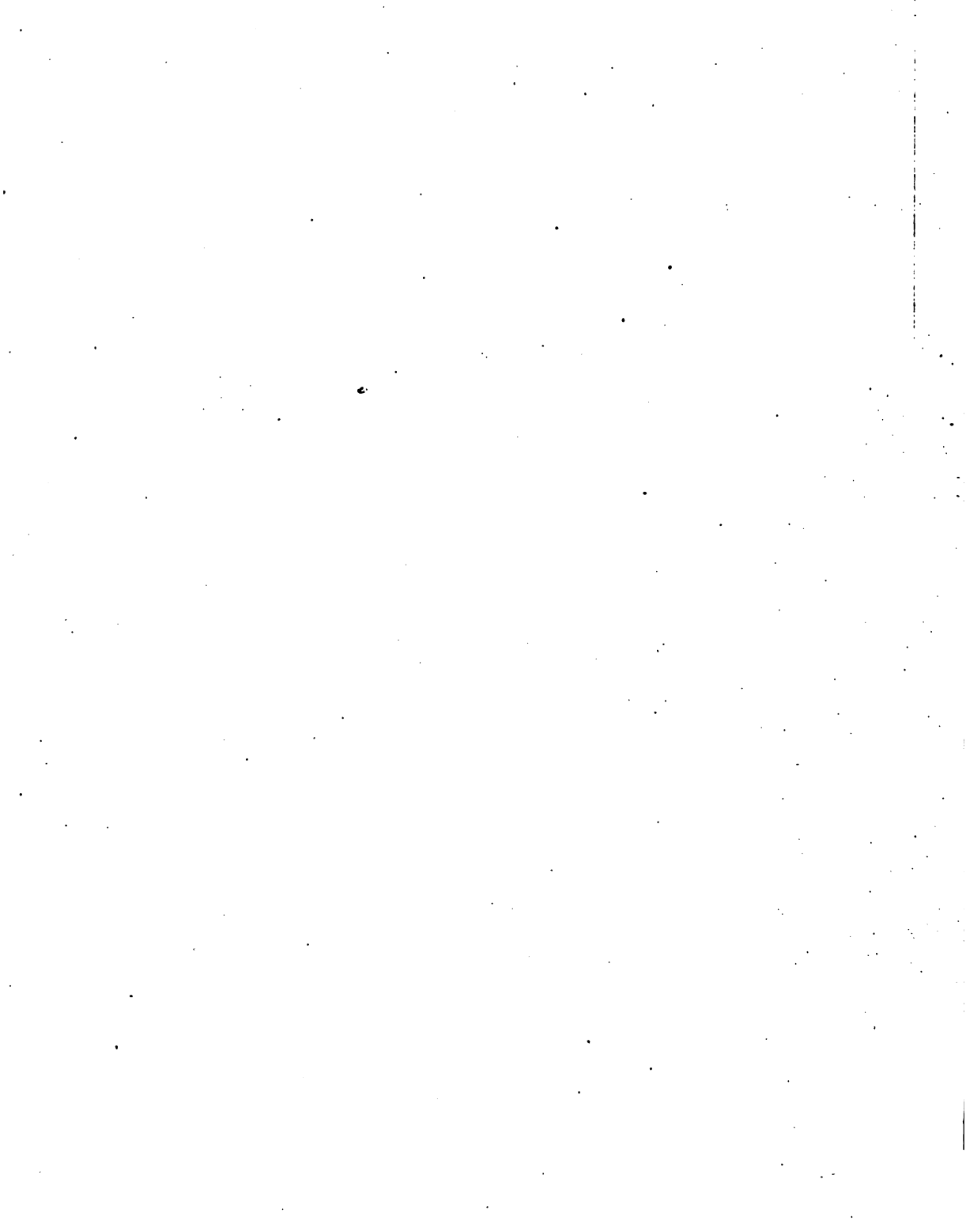
5.0 RECOMMENDATIONS:

1. Given the importance of the tomato as both a fresh market and processed commodity in Brasil, I believe the individual assigned to breeding work on this crop within CNPH/EMBRAPA should not have other crop responsibilities but should be free to devote his/her entire time to the needs of this species.
2. Given the unique differences between tomatoes for processing versus fresh use, breeding programs for each use should be separate (but closely linked!). A single individual could readily handle both fresh market and processing tomato breeding programs if he/she had no responsibilities for other crops.
3. Ample opportunity should be provided to the specialist working on this crop to visit the major production regions in Brasil (at least once each season and preferably more!) and identify priority problems which should be addressed in breeding programs. Some exposure to programs outside of Brasil should also be encouraged. The EMBRAPA/CNPH program should provide national focus and leadership for the nation's public tomato improvement programs.
4. Research on processing tomato culture and management should be expanded to address some of the cultural and crop management problems which are likely to arise as this industry continues to expand. Future yield increases and improvements in quality are likely to involve a combination of improvements in variety and crop management.
5. Improved communications must be developed with the Food Processing Industries to solicit their assistance in prioritizing research (and extension) needs and to secure the long term stable funding needed to build an effective public research infrastructure. Industries must join forces to help to build a strong public research (and extension) capability to solve future problems of their industry!
6. Facilities and technical competence within CNPH for disease and insect resistance research to support the tomato breeding effort appear good. Technical competence and facilities in Food Science and Technology should be considered to support future research in product development and processing quality.
7. A forum should be developed to provide better national coordination and communication among research workers working on the same crops. An opportunity for such communication might be provided each year during the SOB meetings through the formation of "crop advisory committees" and/or the development of national or regional variety trials.
8. A mechanism for seed production and better maintenance of genetic purity of publicly developed processing tomato varieties must be developed. At the present time, genetic purity of new cultivars declines rapidly as a result of seed mixtures during extraction by the processing industries. The ultimate solution to this problem requires the adoption of crop establishment methods which minimize seed use and which encourages the use of high value and carefully maintained seed.
9. More effective mechanisms for the dissemination of research results to the "end user" should be explored. This might take the form of a "Production Guide" which would be updated periodically to incorporate new research results. A publication prepared by IPA in 1984 (See reference below) represents an excellent example to build upon. In addition,

field days at critical times during the crop season should be used to communicate new developments to growers and field staff of the "processing companies. Relevant research and effective communication of research results between public and private sectors will be needed to encourage the development of a strong research support base in the private sector.

Reference

Paulo Cesar Tavares de Melo, Edinaldo Ferraz and Luiz Jorge da G. Wanderley, 1984
Cultivo do Tomate Industrial em Pernambuco
INSTRUÇOES TECNICAS DO IPA No. 16, June, 1984



Programa II. Geração e Transferência de Tecnologia

O Programa de Geração e Transferência de Tecnologia é a resposta do IICA a dois aspectos fundamentais: (i) o reconhecimento, por parte dos países e da comunidade técnico-financeira internacional, da importância da tecnologia para o desenvolvimento produtivo do setor agropecuário; (ii) a convicção generalizada de que, para aproveitar plenamente o potencial da ciência e da tecnologia, é necessário que existam infra-estruturas institucionais capazes de desenvolver as respostas tecnológicas adequadas às condições específicas de cada país, bem como um lineamento de políticas que promova e possibilite que tais infra-estruturas sejam incorporadas aos processos produtivos.

Nesse contexto, o Programa II visa a promover e apoiar as ações dos Estados membros destinadas a aprimorar a configuração de suas políticas tecnológicas, fortalecer a organização e administração de seus sistemas de geração e transferência de tecnologia e facilitar a transferência tecnológica internacional. Desse modo será possível fazer melhor aproveitamento de todos os recursos disponíveis e uma contribuição mais eficiente e efetiva para a solução dos problemas tecnológicos da produção agropecuária, num âmbito de igualdade na distribuição dos benefícios e de conservação dos recursos naturais.

INSTITUTO INTERAMERICANO DE COOPERAÇÃO PARA A AGRICULTURA

O Instituto Interamericano de Cooperação para a Agricultura (IICA) é o organismo especializado em agricultura do Sistema Interamericano. Suas origens datam de 7 outubro de 1942, quando o Conselho Diretor da União Pan-Americana aprovou a criação do Instituto Interamericano de Ciências Agrícolas.

Fundado como uma instituição de pesquisa agrônômica e de ensino, de pós-graduação para os trópicos, o IICA, respondendo às mudanças e novas necessidades do Hemisfério, converteu-se progressivamente em um organismo de cooperação técnica e fortalecimento institucional no campo da agropecuária. Essas transformações foram reconhecidas oficialmente com a ratificação, em 8 de dezembro de 1980, de uma nova convenção, que estabeleceu como fins do IICA estimular, promover e apoiar os laços de cooperação entre seus 31 Estados membros para a obtenção do desenvolvimento agrícola e do bem-estar rural.

Com um mandato amplo e flexível e com uma estrutura que permite a participação direta dos Estados membros na Junta Interamericana de Agricultura e em seu Comitê Executivo, o IICA conta com ampla presença geográfica em todos os países membros para responder a suas necessidades de cooperação técnica.

As contribuições dos Estados membros e as relações que o IICA mantém com 12 Países Observadores, e com vários organismos internacionais, lhe permitem canalizar importantes recursos humanos e financeiros em prol do desenvolvimento agrícola do Hemisfério.

O Plano de Médio Prazo 1987-1991, documento normativo que assinala as prioridades do Instituto, enfatiza ações voltadas para a reativação do setor agropecuário como elemento central do crescimento econômico. Em vista disso, o Instituto atribui especial importância ao apoio e promoção de ações tendentes à modernização tecnológica do campo e ao fortalecimento dos processos de integração regional e sub-regional.

Para alcançar tais objetivos o IICA concentra suas atividades em cinco áreas fundamentais, a saber: Análise e Planejamento da Política Agrária; Geração e Transferência de Tecnologia; Organização e Administração para o Desenvolvimento Rural; Comercialização e Agroindústria, e Saúde Animal e Sanidade Vegetal.

Essas áreas de ação expressam, simultaneamente, as necessidades e prioridades determinadas pelos próprios Estados membros e o âmbito de trabalho em que o IICA concentra seus esforços e sua capacidade técnica, tanto sob o ponto de vista de seus recursos humanos e financeiros, como de sua relação com outros organismos internacionais.

FECHA DE DEVOLUCION

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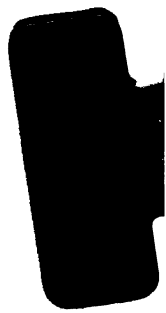
Autor

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Devolución

Nombre del solicitante

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