

# IICA



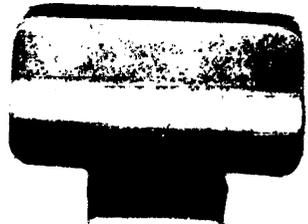
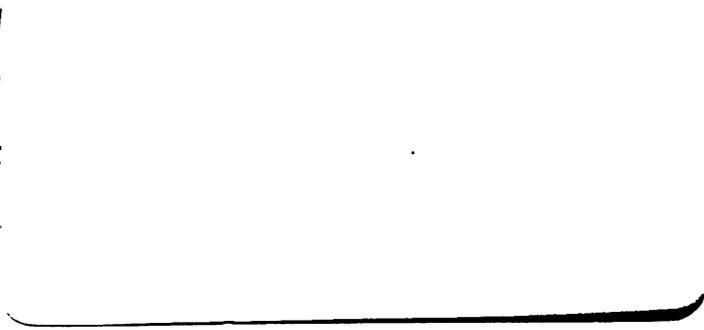
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IICA/EMBRAPA-PROCENSUL II  
Consultant Final Report  
IICA/EMBRAPA-PROCENSUL II

ADVANCED INTERNATIONAL COURSE  
ON SEED PATHOLOGY, WHEAT

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ON SEED PATHOLOGY, WHEAT

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Schaad, Norman W.

Advanced international course on seed pathology. Wheat. Consultant final reporter IICA/EMBRAPA-PROCENSUL II/por Norman W. Schaad.-Brasília: IICA/EMBRAPA, 1989.

9 p. (IICA. Série Publicações Miscelâneas, A4/BR89-002).

ISSN 0534-0591

1. Semente-Trigo-Patologia. I. Título. II. Série.

CDU 631.531:632.93  
AGRIS A50;H20

Série Publicações Miscelâneas No.A4/BR-89-002  
ISSN-0534-0591

ADVANCED INTERNATIONAL COURSE  
ON SEED PATHOLOGY, WHEAT

Consultant Final Report  
IICA/EMBRAPA-PROCENSUL II

Norman W. Schaad

Brasília, janeiro de 1989

INSTITUTO INTERAMERICANO DE COOPERAÇÃO PARA A AGRICULTURA  
EMPRESA BRASILEIRA DE PESQUISA AGROPECUARIA

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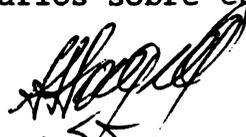
## APRESENTAÇÃO

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.

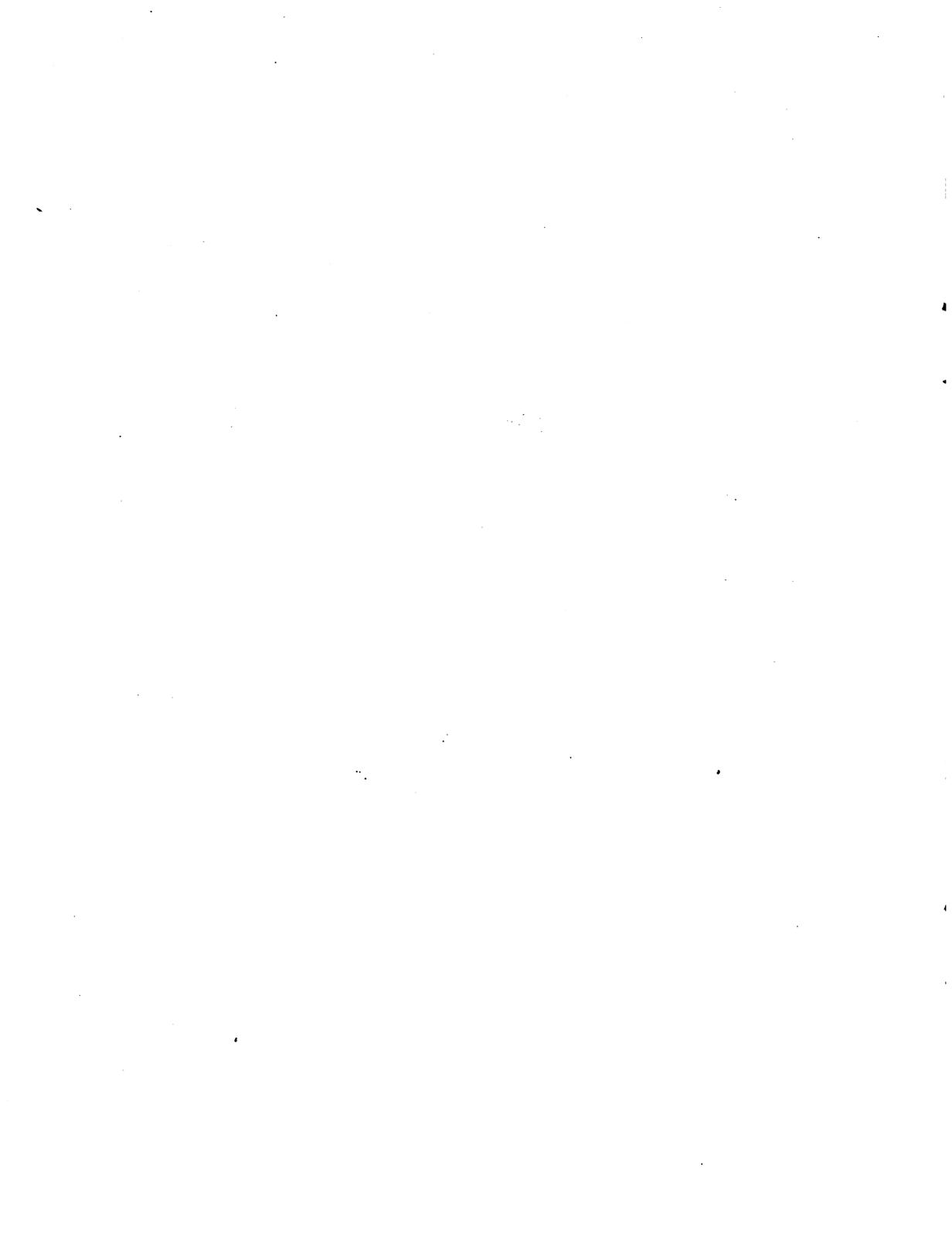
As atividades de consultoria são realizadas no âmbito do Projeto de Desenvolvimento da Pesquisa Agrícola e Difusão de Tecnologia na Região Centro-Sul do Brasil - PROCENSUL II, financiado parcialmente pelo Banco Interamericano de Desenvolvimento - BID e a EMBRAPA conforme os contratos de Empréstimo 139/IC-BR 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. Stagno  
Coordenador Contratos IICA/EMBRAPA



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

**CONSULTANT FINAL REPORT**

1. Consultant's full name: **NORMAN W. SCHAAD**
2. Specialist in: **Bacteriology/Wheat**
3. Title of IICA Project: **2SB3**
4. EMBRAPA Program for which consultancy is provided:  

**PROCENSUL II**  
**I. PESQUISA VEGETAL**

<b>IICA Project Activity Code:</b>	<b>Administrative Code:</b>
<b>Title of Activity of IICA Project corresponding to this consultancy</b>	<b>Cooperation with EMBRAPA on research activities in the field of crop production.</b>
<b>CONSULTANT CONTRACT PERIOD</b>	<b>DUTY LOCATION (Center)</b>
October 17 to October 26, 1987	CNPT/EMBRAPA - PASSO FUNDO/RS
<b>CONTRACT EXTENSION PERIOD (If any)</b>	<b>DUTY LOCATION (Center)</b>

5. Financial support: **PROCENSUL II**

### 6.3 TRAINING ACTIVITIES DEVELOPED BY THE CONSULTANT

Date	Training subject matter	Type of event*	Number of beneficiaries	
			From ENBRAPA	From other institutions
18-24 Oct. 1987	Seed Pathology	Short Course	59 Total	

Participated as a lecturer in Advanced International Course on Seed Pathology held in Passo Fundo. Presented lecture on "The use and limitations of methods to detect seedborne bacteria" and part of discussion groups on 1) the use of seed health testing for bacteria in routine laboratories and 2) comparative seed health testing.

This course was well organized. I was impressed by the active involvement of the participants. Some very good questions were asked. In general the discussion sessions were lively. This was an excellent course.

\* Short courses, seminars, conferences, etc.

### 6.4 IN-SERVICE TRAINING PROVIDED BY THE CONSULTANT

In-service training subject matter	Names of counterparts

**6.5 ACTIVITIES IN SUPPORT OF RESEARCH STRATEGY AND PLANNING**

Research subject matter	Research program to which subject matter is concerned
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Control of black chaff of wheat

Discussed black chaff problem in the breeding program with Dr. Mauricio Fernandes. Discussed plans with Dr. Arolodo Gallon, also.

**6.6 ACTIVITIES IN SUPPORT OF OTHER CENTERS AND UNIVERSITIES IMPROVING THE RESEARCH CENTERS LINKS WITH ABROAD**

Subject matter on which links were recommended	Persons, centers and universities recommended for contact
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**6.7 PUBLICATIONS AND REPORTS UNDERTAKEN WITH THE CONSULTAT'S PARTICIPATION**

Author(s)*	Title of publication or Report and other bibliographic identification
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Schaad, N. W.

"Apostila"  
IN: The use and limitations of methods to detect seedborne bacteria.

\* Personal, institutional, etc.

**6.8 SUPPORT PROVIDED TO EMBRAPA RESEARCHERS IN THESIS AND DISSERTATION WORK**

Name of the student	Thesis subject matter and synthesis of advice
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8. CONSULTANT'S SUGGESTIONS AND TECHNICAL OR INSTITUTIONAL RECOMMENDATIONS FOR THE IMPROVEMENT OF THE RESEARCH SERVICE

During discussion on control of black chaff of wheat the following priorities were established:

- 1) Assay all EMBRAPA foundation seeds for the black chaff pathogen, Xanthomonas campestris pv. translucens.
- 2) Determine how common seedborne X. translucens is in commercial seed lots.
- 3) Determine the effectiveness of the semiselective medium XTS agar in the inhibition of seedborne saprophytic bacteria on Brazilian seeds. Dr. Fernandes is currently making modifications in the medium.

The following additional projects need attention, also:

- 1) Treat contaminated breeder and/or foundation seed with the hot water cupric acetate method to eradicate X. translucens.
- 2) Screen all advanced breeding lines for resistance to black chaff.
- 3) Test all released cultivars for symptoms.
- 4) Choose 3 or 4 lots for comparative assay tests with University of Idaho.
- 5) Test other fungicides such as benlate or benomyl to replace cycloheximide in XTS agar. Cycloheximide is too expensive.
- 6) Determine if antagonism is occurring on XTS agar. Antagonism will inhibit X. translucens from growing.

It is recommended that an EMBRAPA pathologist, such as Dr. Fernandes, be assigned to work on bacterial disease only. This person should be sent to Idaho for 2 or 3 months for advanced training in seed bacteriology. He should be responsible for field controls, seed health testing and resistance screening, and identification of other bacterial diseases. Such diseases as basal glume rot (Pseudomonas atrofaciens), P. syringae, and Clavibacter tritici may become problems once the fungal diseases are brought under control. Commonly, bacterial diseases only become evident once foliar symptoms of fungal diseases are eliminated.

Finally, communication and cooperation with Idaho should be continued to keep up with current research going on in Idaho on black chaff. A second trip should be planned to Brazil for 1988 or 1989. The disease situation and progress should be evaluated.

Dr. Fernandes has done preliminary work with assaying seed for X. translucens. Because he found that XTS agar does not reduce saprophytic bacteria associated with Brazilian seed lots well enough, he has attempted to modify the medium by adding X-gal. In addition, cycloheximide, which is used in XTS agar to control growth of fungi, cannot be obtained. A recommendation was made to use benomyl and/or benlate. To reduce saprophytic bacteria, a survey of Brazilian seed lots should be made. Antibiotics should be tested by placing filter paper discs impregnated with antibiotics onto XTS agar and overspraying the plate with a seed washing containing saprophytic bacteria. If possible, these studies should be done in Idaho. To do so, 500 g of 4 or 5 seed lots should be sent to Idaho. The presence of antagonists in Brazilian seed should also be tested. If such antagonists are present, the XTS agar assay will not work and certain modifications must be made. Methods to test for antagonists were discussed.

Comparative tests between EMBRAPA and University of Idaho should be done in order to be sure the assay is done correctly.

## 8. continued

Methods for establishing field tolerances were discussed. Seed from 2 naturally contaminated seed lots grown in Brasil should be used. One lot should have a high ( $1 \times 10^5$  CFU/ml) and one a low ( $1 \times 10^3$  CFU/ml or lower) level of contamination. A total of 15 samples should be used for each lot. Five will be assayed in the laboratory and 10 sown in plots. Five replications should be grown in Passo Fundo and 5 sown in Parana. The seed should be harvested and the level of contamination (seed transmission) determined. The experiment should be repeated the next season. The plots in Parana should be irrigated by sprinklers.

Once confidence is established in the seed assay, EMBRAPA foundation seed, important commercial cultivars and several CIMMYT breeder seed lines should be assayed. For breeder seed, the seed should be dried and returned to the breeder.

The hot cupric acetate seed treatment should be used to clean up any contaminated breeder or foundation seed. A detailed outline of the method for treating wheat seed will be mailed to Dr. Fernandes.

If Dr. Fernandes or another EMBRAPA plant pathologist cannot devote full time to working with bacteria, someone should be sent to Idaho to obtain a Ph.D. in plant pathology, working on a seed bacteriology program. As mentioned earlier, other bacterial diseases are known in wheat. In addition, undescribed bacterial diseases may be present in wheat in Brasil. With the improved control of fungal diseases, symptoms of bacterial diseases will most likely become more visible. This is known to happen in Idaho.

We also discussed the variability in symptoms of black chaff in different cultivars. Various cultivars should be inoculated and symptoms recorded.

A workshop on detection of seedborne bacteria, including X. translucens, should be offered by EMBRAPA for workers in other areas in Brasil. This should be an actual hands-on workshop and not a lecture seminar. Actual seed samples from Brasil should be used.

Finally, a bacteriologist from EMBRAPA should join the Bacteriology Working Group of ISTA. This should be done by writing to the Working Group Leader, N. W. Schaad. This group develops and tests routine seed health methods.

9. AGREEMENTS OR COMMITMENTS ESTABLISHED WITH EMBRAPA RESEARCHERS IN-SERVICE OF  
THE FUTURE DEVELOPMENT OF RESEARCH IN THE CONSULTANT'S FIELD OF SPECIALIZATION

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I recommend that Dr. Fernandes work in my laboratory for 2 or 3 months to become more acquainted with working with X. translucens. We may need to cooperate on modification of the selective media. I should also spend 10-14 days working in the field with Dr. Fernandes in Parana and Rio Grande Sol. This should be about 3-4 weeks before harvest.

10. CONSULTANT'S COMMENTS ON CIRCUMSTANCES WHICH AFFECTED THE CONSULTANCY WORK

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Date:

11 March 1987

Signature



## 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.





