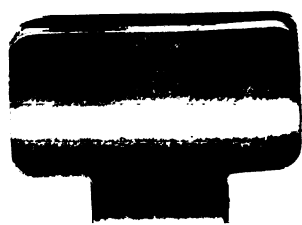
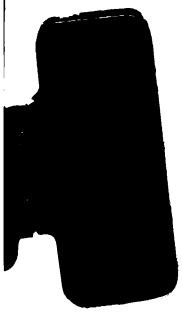


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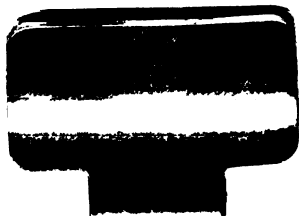
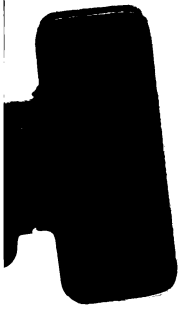
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Brasília, fevereiro de 1989

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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.

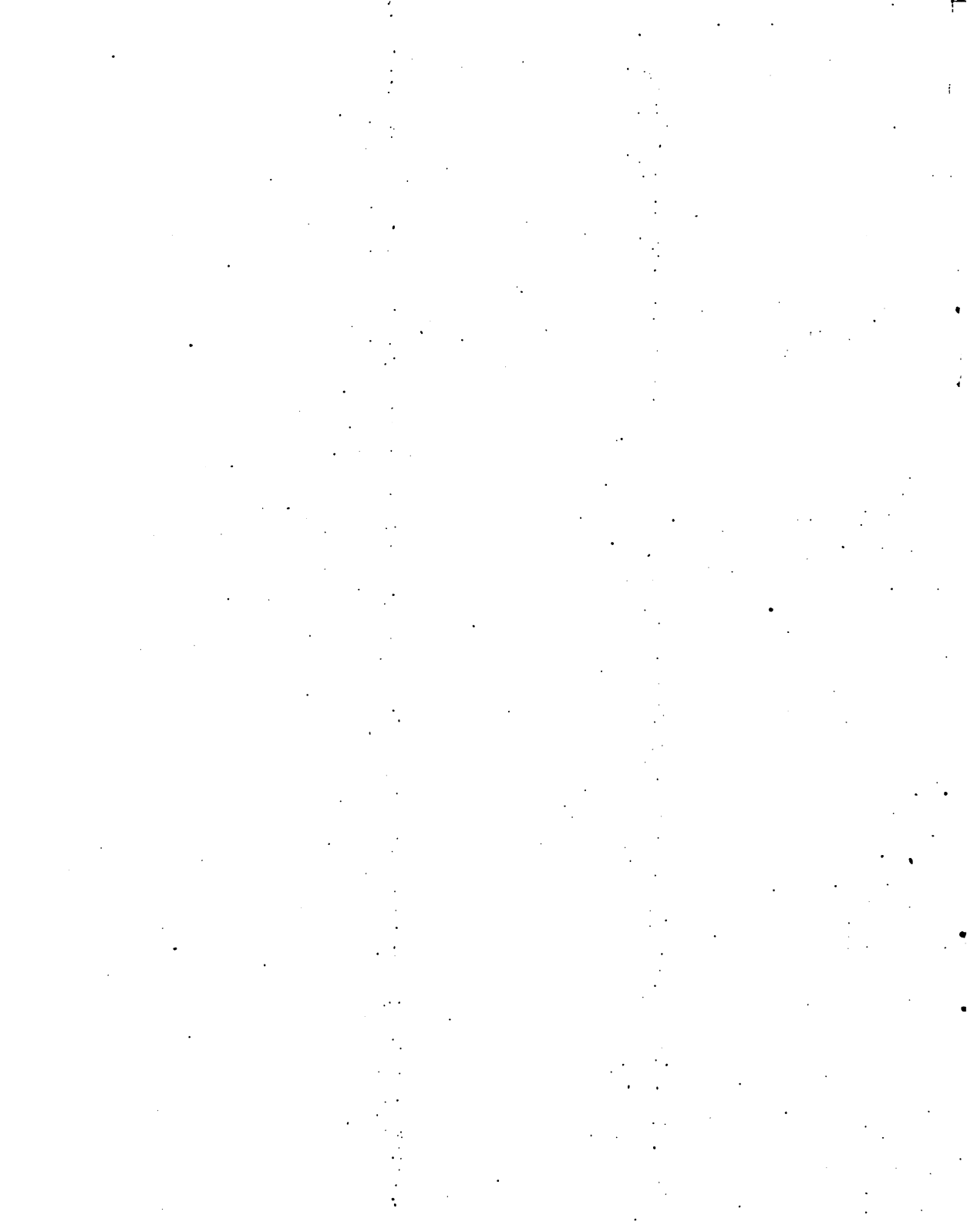
As atividades de consultoria são realizadas no âmbito do Projeto de Desenvolvimento da Pesquisa Agrorpecuária e Difusão de Tecnologia na Região Centro-Sul do Brasil - PROCENSUL II, financiado parcialmente pelo Banco Interamericano de Desenvolvimento - BID e a EMERAPA conforme os contratos de Empréstimo 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 agradeceria receber comentários sobre estes relatórios.



Horacio H. Stagno
Coordenador Contratos IICA/EMBRAPA



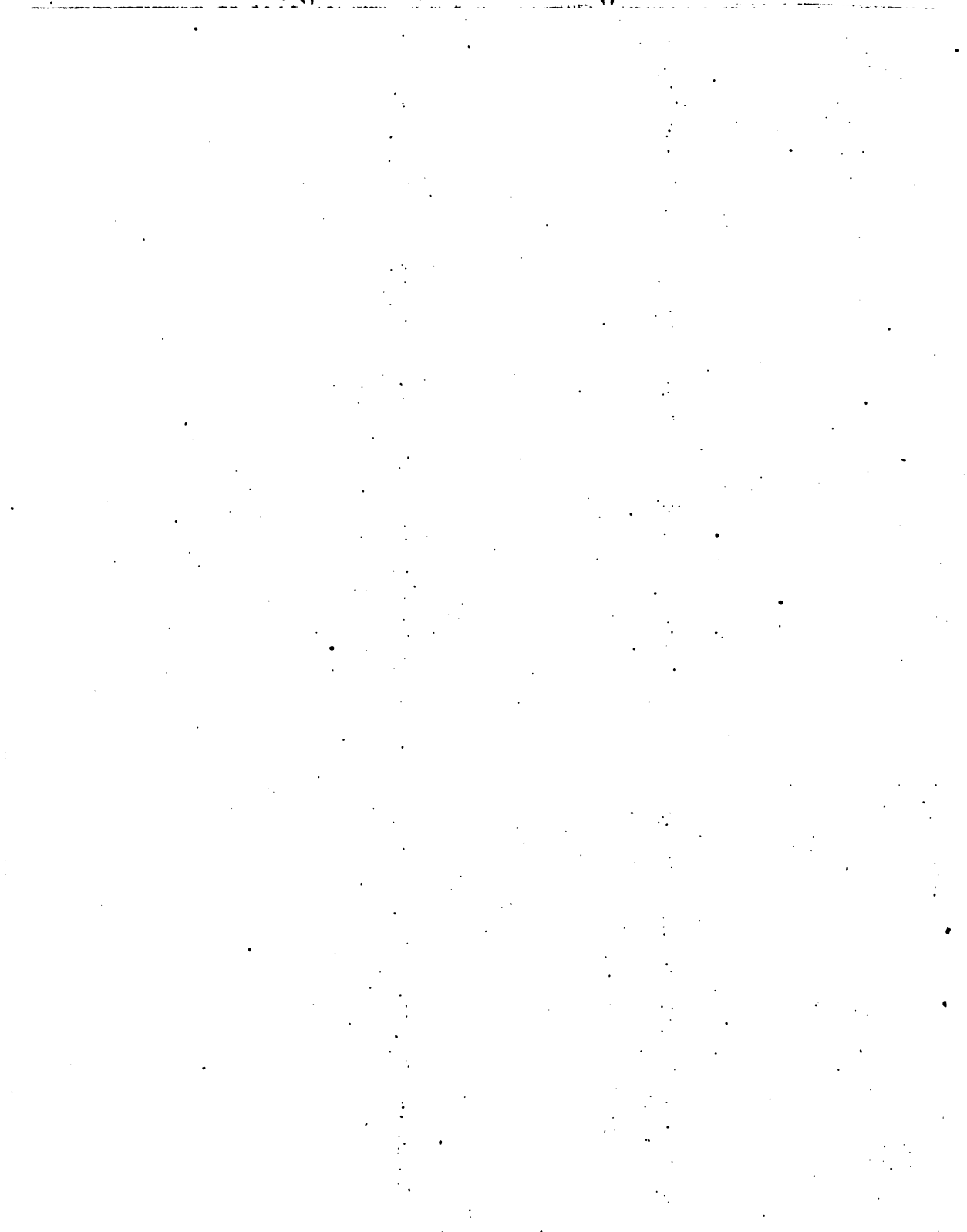
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RELATÓRIO FINAL DE CONSULTORIA

1. Nome do consultor: John Vernon Wilkins
2. Especialista em: Produção Animal
3. Nome do Projeto de IICA: 2. SB. 3
4. Especificar qual o Programa da ENBRAPA em que a consultoria está sendo prestada:
Programa : PROCENSUL II
Sub-Programa: 02 - Produção Animal

Código Atividade Projeto IICA:2.SB.3.02		Código contábil: R 4884 B1B 03103	
Título da Atividade do Projeto de IICA correspondente a esta consultoria		Apoio a EMBRAPA para desenvolvimento de pesquisa na área de Produção Animal	
PERÍODO DE CONTRATAÇÃO		SEDE DA CONSULTORIA	
26-06-88 a 09-07-88		CPAP/Corumba	
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Conselho Britânico, Brasília, Brazil



**Cattle Conservation and Breeding Programmes
of CPAP in the Pantanal, Brazil.**

Background

The Matto Grosso Pantanal (the latter word meaning swamp, is an area of 139.111 km² with an altitude that ranges from 80 m to 150 m above sea level. It lies in the basin of the upper Paraguay river between 16° and 22° S and 53° and 61° W. There is a declivity from north to south of 2.5 cm to 5.0 per km. Mean annual rainfall for the area is aprox. 1200 mm with a winter dry season. Mean annual temperature is 25° C. Maximum temperatures of 40° C occur in late winter and early spring (August - October) when the land is driest.

The area is alluvial and receives the sediments of several rivers other than the Paraguay which causes great variation in soil type.

Slight differences in altitude determine if an area within the Pantanal is subject to flooding or not and this altitude also affects the depth and length of time of that flooding. These small differences in altitude coupled with the different soil types produce the large number of micro environments of the zone.

Farms producing beef cattle that graze the natural pastures and forages occupy much of the area but the Pantanal has not yet been directly affected by intensive modern agriculture. It is official policy to protect and conserve the Pantanal, which is extremely rich in flora and fauna, and livestock breeding must be directed towards providing animals for production systems that will maintain, as far as possible, the existing harmony between domestic animals and the environment and that will minimise changes in the botanical equilibrium. It must be noted that the area contains a high population of wild herbivores that are to be protected and these include the very numerous capybara as well as species of deer.

The average farm size is 7.788 hectares with a stocking rate of 3.7 hectares per head. The cattle are the result of several generations of crossing zebu bulls with the Criollo cattle of the Pantanal. It would appear that the Nellore breed is now the numerically most important in the area.

Cattle are normally sold through middlemen for immediate slaughter or for fattening and leave the area either by foot, by boat, by truck or by rail or by a combination of these.

The horse is of fundamental importance to the cattle industry of the Pantanal as it is essential to management in the flooded grazing lands.

The cattle breeding and conservation work of EMBRAPA in the Pantanal is performed at its experimental station, the Fazenda Nhúmirim, 210 km east of Corumbá at 18° 59' S and 56° 39' W. It has a mean altitude of 89 m and the soil type is essentially sandy. Mean annual rainfall is 1175 mm of which 77% falls between October and March. The property has an area of 4311 hectares of which one third is woodland, one third grassland, one third lagoon. It must be noted that the lagoons provide forage for the domestic livestock. There is a boundary fence and the property has internal fencing providing 19 paddocks of different sizes. One of the paddocks has been set aside as a nature reserve to be free of domestic livestock and would provide a necessary control for environmental changes that will occur in the area being managed for livestock production. Unhappily, grazing requirements for the animals has necessitated the entry of cattle into this "reserved area" on several occasions. At present the property contains 1,515 cattle, 113 water buffalo and 92 horses indicating a domestic livestock population density of one head to 2.5 hectares which might be argued to be too great.

The two EMBRAPA organizations, CENARGEN (the centre for the conservation of genetic resources) and CPAP have initiated a programme to conserve the Criollo cattle of the Pantanal. Because of the difficulty of access to very many properties in the Pantanal, the present size of population is not known but it is very unlikely to be large. It is supposed that there are still animals in very small groups scattered among the four million zebus of the zone.

In September 1985 a group of cows and bulls was acquired by CPAP and CENARGEN commenced a programme of collecting and freezing semen and embryos. In November 1987 there were reported to be 5 bulls, 40 cows and 15 heifers between 2 and 3 years of age at Nhumirim.

The following production parameters have been determined for the Criollo herd at Nhumirim.

	Males	Females
Birth weight (kg)	22 ± 3	19 ± 3
Adult weight (kh)	375 ± 7	298 ± 41
Calving interval (days)	-	404 ± 72

This would suggest that the herd is fertile and that birth and adult weight are lower than is generally reported for Criollo cattle in the humid tropics.

A trial was initiated in 1986 to compare the performance of zebu cattle with the Criollo and a herd of 40 zebu cows on Fazenda Nhumirim is being recorded for this purpose. Data being collected on both genotypes include birth weights, weaning weights, post weaning gain, weight at parturition, mortality and fertility.

The Pantaneiro Criollo horse, that is descended from animals introduced by the first settlers and has has some 200 years to become adapted to the environment, has also been subject to indiscriminate crossing with other breeds but to a much lesser degree than in the case of Criollo cattle. However, it has suffered considerable losses in recent years when equine infectious anaemia was introduced into the area. A Pantaneiro Criollo Horse Breed Society has been formed and CPAP supports the Society's work by maintaining its pedigree records. CPAP also owns a small herd of these horses at Nhumirim. Work has commenced on a study of body measurements (and the ratios between these) of the horses registered by the society. This is based on a document entitled "Metodos de Melhoramento Genético e Sistema de Acasámentos aplicados aos Equinos" by M.A. Giannoni and published by UNESP, Jaboticabal S.P.. The author of the document suggests that these measurement and ratios may be used to breed for a desirable "harmonious conformation" and cites Jones, W. E., "Genetics and Horse Breeding". Lea and Febiger Philadelphia. 1982, in support of this.

Terms of Reference of Consultant

"The consultant must undertake, together with the research workers of the area and neighbouring zones, a reflection regarding what must be the direction of investigation in conservation of animal genetic resources of the centre for Agricultural Research of the Pantanal (CPAP) of the Brazilian federal agricultural research organization (EMBRAPA), prioritizing objectives in the medium and long term in order to ensure the efficiency of these actions.

Considering the objectives cited in the above paragraph and the environmental conditions of the Pantanal, its potential in terms of forage resources and the type of breeding and commercialization, to define a strategy of conservation, evaluation and or improvement of Pantaneiro cattle; in this last case suggesting the breeds or local types for possible utilization and the most appropriate methods of crossing or selecting.

To proceed to critically analyse the projects of conservation of animal genetic resources of CPAP in execution or newly proposed, principally in the aspect of methodology.

In accord with the established norms of EMBRAPA for the employment of a foreign consultant, the consultant must give a seminar in order to divulge the results and recommendations".

Proposals of CPAP for future work in animal breeding and genetics

1. To continue the determination of production parameters of the Criollo cattle at Nhumirim and the comparison of these with those of zebu cattle on the station.
2. To initiate crossbreeding trials to determine the most appropriate genotypes in order to optimise production in the Pantanal.
3. To make a livestock survey of the Pantanal in order to determine the number and location of Pantaneiro Criollo cattle and horses.
4. To characterize the genetic markers of Criollo cattle and horses.

5. To study resistance to internal parasites in Criollo cattle in Nhumirim and to look for correlations between degrees of resistance and genetic markers.
6. To develop selection parameters based on body measurements, ratios and correlations for the improvement of the Pantaneiro horse.
7. Together with the staff of CENARGEN and CNPGC, Campo Grande, to collect 500 doses of semen from each of 5 Criollo bulls and collect and freeze a total of 100 embryos from nine Criollo cows.

Consultants Observations on Proposals

(1) Evaluation of Criollo cattle

The consultant, with the CPAP staff, examined the adult Criollos at Nhumirim and found 21 females over 2 1/2 years of age that were phenotypically Criollo and 24 females over 2 1/2 years old that showed physical characteristics that suggested that they contain a low percentage of zebu blood. 12 females over 2 1/2 years of age were recommended for sale as they certainly contained a high percentage of non Criollo blood. It was learnt that there were another 8 Criollo cows belonging to CPAP in Campo Grande where CENARGEN is attempting to collect and freeze embryos. Three mature and four immature Criollo bulls with satisfactory physical characteristics were also seen. In brief, CPAP has 21 adult Criollo females suitable for breeding bull replacements plus 8 more in Campo Grande that it is hoped will be returned to Nhumirim soon. There are a further 24 high grade adult Criollo females suitable for producing female replacements. There are 4 adult bulls in service and four young bulls that are sons of existing cows. All the animals were given by two cattlemen and it is logical that animals from the same herd are related and it is probable that they are inbred to varying degrees.

The following obvious observations must be made:

- (a) The population to determine breed production parameters is very small.
- (b) It is not known how representative the herd at Nhumirim is of the whole breed population.
- (c) The herd at Nhumirim may already be suffering from inbreeding depression.

If it is assumed that the herd is representative of the whole population of Criollo cattle, it is necessary to clarify the objectives of the programme and the ways in which it might assist the livestock industry.

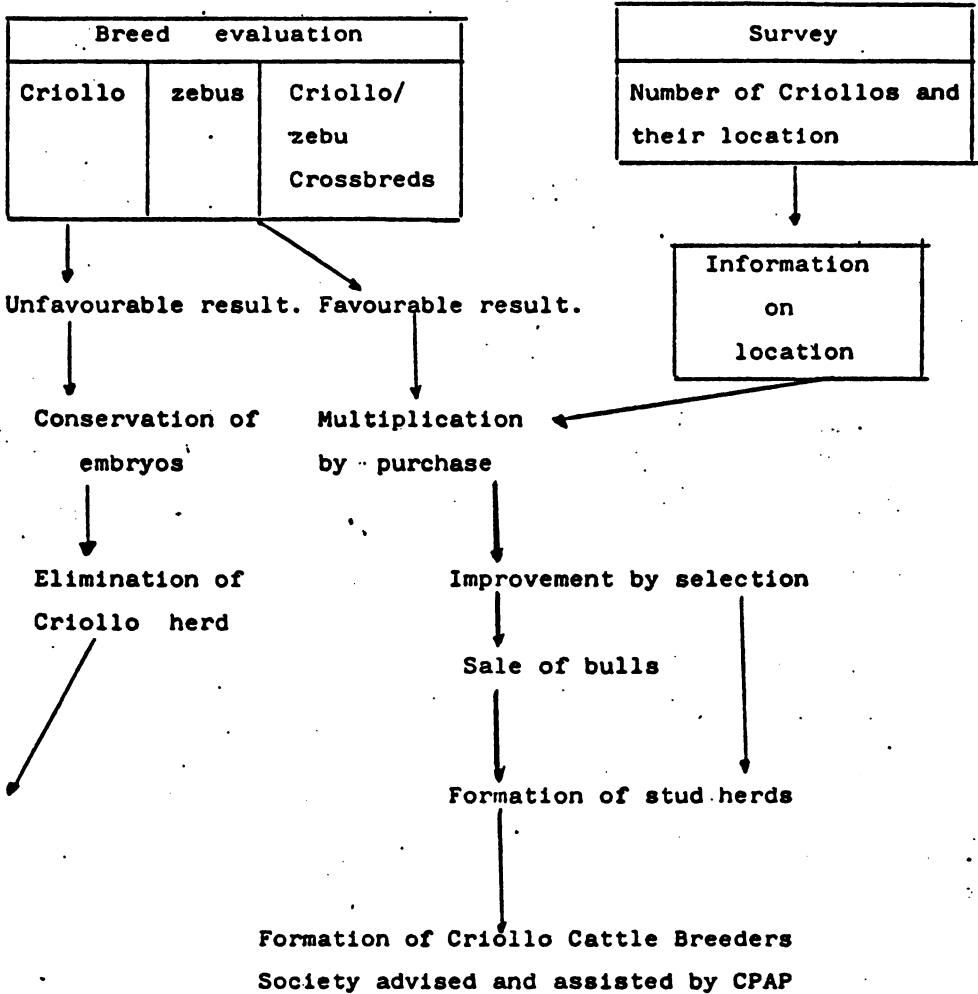
The breed evaluation can have two possible results - the breed has immediate commercial value or it does not. In the latter case, the herd might be sold and the germoplasm conserved in the form of frozen semen and embryos.

If the breed is shown to have commercial value, the herd will have to be increased in size by purchase which will be made much easier by the results of the livestock survey that is to commence in the near future because this will have determined which properties have Criollo cattle.

A selection programme must then be commenced to improve speed of growth while retaining high fertility and low calf mortality.

The results of this selection would be disseminated to farmers and some of these would wish to form their own stud herds. CPAP staff would advise the owners of the stud herds on the selection of their animals and Fazenda Nhumirim would produce Criollo bulls to sell to these properties. A breed society would be formed which CPAP would advise and carry out all necessary data analysis. This is shown graphically on page 7.

Possible Developments of CPAP Criollo Project



The writer must observe here that the evaluation of the Criollo breed can only be carried out if there is an improvement in the quality of support services at Nhumirim. There was much evidence of failures regarding management and data recording. If this continues, the whole project would be made valueless.

In order to fully evaluate the criollo breed, it will be necessary to determine its value in crossbreeding with the zebu, this replicating work already done on the flood plains of Venezuela and Bolivia. It is therefore suggested that another group of 40 zebu cows be selected and maintained with 3 or 4 Criollo bulls. There would thus be three cow herds:

- (a) Criollo cows with criollo bulls
- (b) Zebu cows with zebu bulls
- (c) Zebu cows with criollo bulls

There is no need to include the reverse cross as criollo cows will be too rare for this to be a feasible practise in the foreseeable future.

It has been suggested that the crossbreeding trial be expanded to include the canchim and carucu breeds. The consultant does not recommend this because of the limitations of support staff, appropriate land and the alternative requirements for land and cattle on the station.

It should be noted here that the land for the three herds should be selected with great care and, if necessary, the fences may have to be moved in order to ensure that each group has similar forage and that the results of the trial are not confounded by differences in availability of pasture.

It is also worth considering that the extra management skills and or capital, that are needed for a successful crossbreeding production system, may not be widely available in the Pantanal.

It might also be shown that the environment might be damaged the construction of the many fences that are necessary in crossbreeding systems and by the subsequent restriction of movement of the cattle.

Determination of Genetic Markers and Relationships Between these and Parasite Resistance

It is logical that there will be considerable variation in genetic markers in the criollo cattle at Nhimirim and it will be surprising if a sufficiently great variation in internal parasite resistance can be established in order to determine relationships between the degree of resistance and genetic markers in this very small population. However it is important that an attempt be made to characterise the herd by this method in order to determine relationships between it and other criollo breeds elsewhere. For example, if it could be determined that the Criollo of the Beni, the Bolivian flood plain, were closely related, then no logical argument could exist to prohibit the introduction of germoplasm from that area to the Pantanal.

The Selection of the Pantaneiro Horse

The consultant is not happy about basing selection of working horses on body measurements and it is recommended that original American work, that was the source of this theory, be obtained and studied and reviews of the book be sought in such journals as Animal Breeding Abstracts.

It is recommended that a survey be made of animals that vaqueros consider to be superior and the qualities that the vaqueros believe to be important should be listed. This list will doubtless include

- (a) Ability to work long hours in water.
- (b) Trouble free hooves while working long hours in water.
- (c) Rapid acceleration and stopping.
- (d) Fast turning.
- (e) Intelligence and docility.

The consultant thinks that the ideal animal will be shown to be of medium size with heavy muscling on the shoulders and over the hind legs and with a relatively short back. Whatever the truth of this, it is necessary to clarify what are the really desirable characteristics before attempting to select for them.

The consultant strongly believes that an organization like EMBRAPA should not involve itself in breeding horses for exhibition particularly if this type were shown to be unsuitable for use by the cattle industry.

Collection and Freezing of semen and embryos

Semen from the five bulls should be obtained because it is simple and rapid and will not affect herd management. In the case of embryos, this is more difficult and very much slower and would mean that the eight cows, that are 15% of the herd, would not be included in the determination of production parameters of the Criollo herd during the period of collection. Once the management and nutritional problems are overcome in Campo Grande, the rate of collection should improve from the present unhappy situation but it would certainly take considerable time to collect and freeze 12 - 15 embryos from each cow. Unfortunately, the absence of these eight cows (and their potential calves) will greatly reduce the validity of the evaluation of the herd.

The consultant recommends that the collection of embryos be postponed until 1991 when the evaluation of the herd will be completed. It is recommended that the eight cows be returned from Campo Grande as soon as possible.

Summary of Recommendations

It is recommended:

1. That the evaluation of the Criollo herd in Nhumirim compared to that of a group of zebu cows be continued with improved and better disciplined support services in order to ensure correct daily management and improved data recording.
2. That the Criollo herd evaluation be expanded to include a study of the performance of crossbred Criollo/zebu cattle compared to Criollo and zebu animals.
3. That the planned livestock survey of the Pantanal be carried out in order to determine the population and location of Pantaneiro

Criollo cattle and horses.

4. That when the results of the Criollo herd evaluation are known, a decision be taken regarding the next phase. If the breed has no commercial value, it may be conserved as embryos. If the breed has valuable commercial characteristics, the population must be increased by purchase to a size that will permit selection for speed of growth, high fertility and low calf mortality. This purchase will be made easier by the results of the livestock survey. Bulls will be produced for sale and the formation of stud herds will be encouraged.

5. That the determination of genetic markers in the Criollo herd be attempted and the results compared to those of other Criollo populations.

6. That the search for relationships between genetic markers and degree of resistance to internal parasites in Criollo cattle be carried out in order to determine appropriate methodology for subsequent work.

7. That the proposed methodology for selection of the Pantaneiro horse be reconsidered after a revision of the literature.

That the desirable characteristics of a working horses in the Pantanal be determined before initiating a selection programme.

8. That the programme for the collection and storage of semen of the Criollo bulls continues.

9. That the programme for the collection and freezing of embryos is halted and recommenced in 1991 after the evaluation of the Criollo herd is completed.

10. That the eight Criollo cows in Campo Grande be returned to Nhimirim as soon as possible.

Acknowledgements

I wish to express my gratitude to Maria Cristina Mazza, José Robson Bezerra Sereno, Urbano Gomes de Abreu and Roberto Aguilar Silva for their considerable assistance and for their hospitality and friendship. I am also grateful to IICA and to ODA, London, for making this consultancy possible.

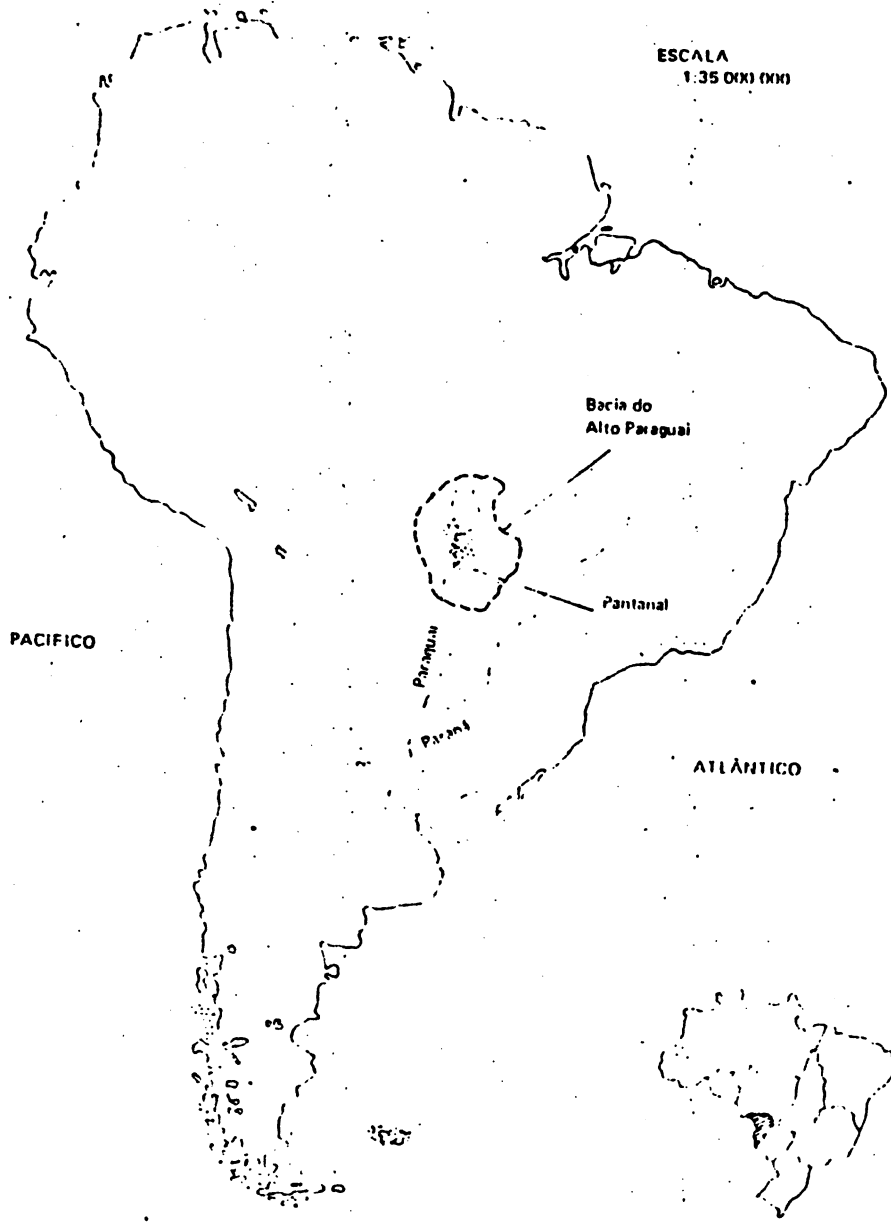


FIG. 1. Mapa de localização.



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.

Interessados em receber mais exemplares deste e de outros Relatórios de Consultores poderão solicitá-los a:

Coordenação dos Contratos IICA/EMBRAPA
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Responsáveis pela reprodução: Jadir José dos Santos e Murillo Sodré da Silva.

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Autor

Catle conservation and breeding programmes of cpap in the pantanal, BRAZIL

Fecha
Devolución

Nombre del solicitante

Fecha Devolución	Nombre del solicitante



