PD-AAU-965

PROGRESS REPORT N°. 17

PROJECT: AGRICULTURAL TECHNOLOGY DEVELOPMENT IN PANAMA

CONTRACT: USAID/PANAMA N°. 525-0180-C-00-2015

PERIOD: JULY 1° TO SEPTEMBER 30, 1986

This report is submitted as part of the requirements of the USAID contract on the project "Agricultural Technology Development in Panama" for the Technical Assistance component provided by Rutgers University to IDIAP. Activities and accomplishments of the project and the Technical Assistance component for the period covered between July 1° and September 30, 1986, are described here, in detail.

This report is subdivided into five main sections following the reports from each five (5) specialists components of the Rutgers Technical Assistance Team. These sections are:

	AREA	SPECIALIST
I.	Tropical Pastures	Pedro Argel, Ph. D
II.	General Agronomy	Mark Gaskell, Ph. D
III.	Soil Fertility and Management	Alvaro Cordero, Ph. D
IV.	Livestock Research and Production	José Zorrilla-Ríos, Ph. D
V.	Administration and Management of Agricultural Research	Carlos A. Neyra, Ph. D (Chief-of-Party)

CARLOS A. NEYRA, ATD PROYECT
(CHIEF-OF-PARTY)

ATD - PANAMA PROJECT

CONTRACT N°.525-0180-C-00-2015

REPORT N°.17

CONTENTS PAGE

I. Tropical Pastures
Dr. Pedro Argel

- Background..... 1
- Germoplasm..... 1
- Agronomic Regional Trial Type B..... 6
- Brachiarias..... 9
- Future Plans..... 12

II. General Agronomy
Dr. Mark Gaskell

- Background..... 13
- Activities During the Reporting Period..... 13
- Identification of New Research Priorities.... 14
- Broccoli, Cauliflower and Tomatoe Agronomic Trials..... 16
- Solar Onion Dryer Construction..... 17
- International Horticultural Congress..... 17

III. Soil Fertility and Management
Dr. Alvaro Cordero

A. Introduction..... 18
B. Technical Assistance and Capacitation..... 18
C. Meetings, Conferences, Seminars, Field Days,. Etc..... 20

CONTENTS PAGE

Research..... 23

Varieties..... 23

E. Other Activities..... 25

IV. Livestock Research and Production
Dr. José Zorrilla Ríos

I. Research Activities..... 26

II. Institutional Support..... 28

V. Agricultural Research Administration and Management.
Dr. Carlos A. Neyra

A. Goal: "To Assist IDIAP in the formulation and implementation of institutional objectives, strategies, priorities and evaluation of agricultural research"..... 34

A.1. ATD Project: Strategic Plan, 1987-1992..... 34

A.2. Evaluation of the Agricultural Technology Development (ATD) Project..... 36

B. Goal: "To act as a Chief-of-Party and in-country coordination of technical assistance provided by Rutgers University to the ATD project in Panama..... 38

I. TROPICAL PASTURES

PEDRO ARGEL, Ph. D

RE. QUARTERLY REPORT N°. 17

PROGRESS REPORT

PERIOD: JULY 1 - SEPTEMBER 31, 1986

Prepared by: Pedro J. Argel
Pasture Agronomist

BACKGROUND

Observations on the performance of germoplasm in the field in sities ecologically differentes and during several growth cycles, are the base for selecting promising materials. Agronomic comparisons with the traditional species, serve as final filters to observe advantages and disadvantages, besides of cuantifying the species yield potential. Species of the genus Andropogon, Brachiaria, Centrosema and Stylosanthes, have demostrated a high yielding potential in Panamá during the last years of pasture evaluation. The high acidity - 60% or more of Panamanian soils are acids - and tolerance to pests and diseases, and a better dry matter distribution with relation to dry and wet season changes, are some of the desirable attributes of the species under evaluation. Advances achieved during the time lapse of this report are given as follows.

GERMOPLASM

Germoplasm evaluation by species adaptation advanced during this period to two different ecosystems that are economically important to Panama. One corresponds to the tropical rainforest of El Darién and

the other to the highlands of Chiriqui Province where specialized dairy cattle ranches exist and the need for adapted and productive germoplasm to the area is a generalized need. Darién is an area of active colonization where a system of slash and burnt of the original jungle is practiced follow up by annual crops, and then, when the soil nutrient reserves are reduced to low levels for crop productivity, pasture are established such as Panicum maximum (Cebollana), Brachiaria radicans (Taner) o Ischaenum indicum (Ratana). This soils deteroriate progressively due to plant nutrient extraction, deficient pasture management and poor adaptation and persistance of the established grasses, thus the ecosystem deteriorates continuosly, losing productivity and increasing soil erosion by the action of the frecuent rains. Forage species better adapted to this soil and climate conditions, have obviously a better chance to stabilize the ecosystem.

Soil characteristics at the adaptation trial site established in Darien are shown in Table 1. This corresponds to a recently deforested area, and acceptable levels of phosphorus (P), interchangeable cations and micronutrients are observed, besides of been a neutral soil with only aluminum traces. These are typical solil characteristics of undisturbed rain forest soils and makes possible to cultivate crops following the slash and burnt process; however, it is well known what happens a few years after when natural soil reserves are exhausted.

TABLE 1. SOIL CHARACTERISTICS OF TORTI-DARIEN (PANAMA).

Depth cm	Texture	O.M. %	pH H_2O	P ppm	Inter Cations Ca	Mg	K	Sat Al %	Mn	Fe	Zn	Cu
					---Meq/100 g---							
0-20	Loam	3.5	6.4	7.8	25.6	7.1	53.2	Tr	64.3	142.5	2.0	4.8

The list of established species are shown in Table 2. Grasses dominate on legume pastures, and within the formers the genus Brachiaria dominates. The reason is that these grasses have a stoloniferous growth habit, and some of them such as B. humidicola, are highly tolerant to acidity and insect pests such as spittle bug. It can be seen the good ground cover of the majority of species two months after establishment, even with local materials such as H. rufa. Among the legumes outstand A. pintoi 17434 and P. phaseoloides 9900 (Kudzú) similarly the S. guianensis 136 a d 184. C. brasilianum 5234 has been severely attacked by Rizoctonia foliar blight, but this is common in this species and does not affect considerable its persistance.

In Volcán (Chiriquí) 27 pasture species were established in August. Table 3 shows the list; predominate Brachiaria species among the grasses and Centrosema and Trifolium among the legumes. The site of this experiment is located at 1,100 m over sea level with mean temperature of 21ºC. Predominates in this area specialized dairy cattle farms and for this reason high quality legumes such as Trifolium from ILCA (Africa) were included. Evaluations carried out two months following establishment show a more advanced cover ground of the species Cynodon sp (Estrella), Axonopus sp (Gramalota) and B. decumbens (Comercial), which are species presently in the area, however other Brachiarias from CIAT are equally promising. Slow growth have shown the legumes, due to a combination of high rainfall and low temperatures; however, during the last months vigorous growth of the C. macrocarpum has been observed.

Table 2. Pasture species established in Regional Trial A (ERA) in Tortí (Darién) - Panama. (Establishment: August 1986)

Grasses	CIAT No.	Ground cover(%)*	Adaptation
A. gayanus	621	96	E
B. decumbens	606	96	E
B. decumbens	6131	-	-
B. humidicola	639	88	E
B. humidicola	679	88	E
B. humidicola	6707	45	B
B. dictyoneura	6133	96	E
B. ruziziensis	6419	90	E
B. ruziziensis	6291	-	-
B. ruziziensis	654	40	B
B. brizantha	6780	100	E
B. brizantha	6012	50	B
B. brizantha	664	40	B
P. maximum	622	100	E
D. swazilandensis	Local	100	E
D. aristatum	Local	100	B
H. rufa	Local	100	E
LEGUMES			
A. pintoi	17434	100	E
C. brasilianum	5234	63	R
C. macrocarpum	5062	63	B
C. pubescens	5189	91	B
P. phaseoloides	9900	100	E
S. guianensis	136	93	E
S. guianensis	184	93	E
S. hamata	118	40	B

* 2 months after planting

E, excellent
B, good
R, regular

Table 3. Pasture Species established in Regional Trial A (ERA) in Bijao - Volcán - Chiriquí.

GRASSES	No.	ADATATION*	GROUND COVER (%)
1. *Brachiaria humidicola*	CIAT 679	R	7
2. *Brachiaria humidicola*	CIAT 6369	B	26
3. *Brachiaria humidicola*	CIAT 6707	B	30
4. *Brachiaria dictyoneura*	CIAT 6133	R	17
5. *Brachiaria ruziziensis*	CIAT 655	B	22
6. *Brachiaria brizantha*	CIAT 664	B	30
7. *Brachiaria brizantha*	CIAT 6780	M	2
8. *Brachiaria decumbens*	Comercial	B - E	58
9. *Brachiaria decumbens*	CIAT 6131	R	21
10. *Cynodon sp* (Estrella)	-	R - B	47
11. *Axonopus sp* (Gramalota)	-	B - E	45
12. *Setaria anceps*	-	B	10
LEGUMES			
13. *Centrosema macrocarpum*	CIAT 5062	M	1
14. *Centrosema macrocarpum*	CIAT 5065	B	4
15. *Centrosema macrocarpum*	CIAT 5478 A	R	2
16. *Centrosema macrocarpum*	CIAT 5274	B	3
17. *Centrosema brasilianum*	CIAT 5487	M	1
18. *Desmodium heterophyllum*	CIAT 349	R	3
19. *Desmodium intortum*	Nativo	-	-
20. *Trifolium stenderi*	ILCA 6253	R	2
21. *Trifolium tembense*	ILCA 5274	R	1
22. *Trifolium quartinianum*	ILCA 6301	R	1
23. *Trifolium decorum*	ILCA 6303	M	1
24. *Trifolium rueppellianum*	ILCA 6260	R	1
25. *Medicago sativa*	Florida 77	-	-
26. *Pueraria phaseoloides*	Kudzú	R	2
27. *Stylosanthes guianensis*	CIAT 184	B	2

Establishment: August 28, 1986.
* Two months after planting. E, excellent; B, good; R, regular; M, bad.

AGRONOMIC REGIONAL TRIAL TYPE B (Rio Hato)

The evaluation of this trial in collaboration with Instituto Nacional de Agricultura (INA) from Divisa, has continued over the rainy season.

Evaluations were accomplished during the time of minimum rainfall. Table 4 shows yields of the species under evaluation for a period of 9 weeks growth; information is also available of plant yield at 3, 6 and 12 weeks, but these are not presented because of similar tendencies. Among the grasses outstands the yield of A. gayanus 6200 compared to the ecotype 621 and to H. rufa; the later had good performance in this ecosystem characterized for soils of low acidity and low aluminum saturation. However the proportion of green leaves was greater in A. gayanus particularly toward the end of the dry season. Wide yield differences were observed among the Brachiarias, and despite that this was not statistically significant, the good production of B. decumbens 606 and B. humidicola 679 can be observed. With the exception of S. macrocephala and S. capitata - Capica, other Stylosanthes had oustanding yields particularly S. scabra 1047 but this species reduced its plant population toward the end of the dry period. Yields of Centrosema ecotypes were similar, but different to other species, they retained a large proportion of leaves, mainly the C. macrocarpum group; other species including Kudzú suffered severe defoliation and yields are a reflection more than nothing of dry residual material with a high stem proportion.

Regeneration from seed is very important for species survival. Observations carried out in this experiment show the high capacity that have S. hamata 118 and S. sympodialis 1044 to regenerate from seed as is shown in Table 5. Other species of the same genus are less agressive,

Table 4. Plant yield (kg MS/ha) during minimun rainfall of germoplasm established in Regional Trial B in Río Hato.

Species	CIAT Nº	Yield kg MS/ha 9 weeks	
GRASSES			
H. rufa	Local	6143	cb
B. decumbens	606	4627	cbd
B. humidicola	679	3784	cbd
B. humidicola	6389	567	d
B. humidicola	6707	380	d
A. gayanus	621	6335	b
A. gayanus	6200	16958	a
D. swazilandensis	Local	1800	cd
		(D.E. = 2341)	
LEGUMES			
S. hamata	118	4923	dc
S. hamata	147	7178	bc
S. guianensis	136	9837	ba
S. guianensis	184	8976	ba
S. sympodialis	1044	5027	dc
S. scabra	1047	11555	a
S. macrocephala	1643	850	gf
S. macrocephala	2133	1023	gef
S. capitata	10280-Capica	120	g
C. macrocarpum	5062	3213	def
C. macrocarpum	5065	2813	dgef
C. macrocarpum	5434	2530	dgef
C. macrocarpum	5478	3970	de
C. pubescens	438	2247	dgef
C. pubescens	5126	2267	dgef
C. pubescens	5189	1600	gef
G. wightii	216	567	gf
P. phaseoloides	9900 (Kudzú)	1890	gef
L. leucocephala	17502	2550	dgfe
		(D.E. = 1452)	

Means followed by the same letter are not statistically significant ($P < 0.05$). Duncan's Multiple Range Test.

Table 5. Seedling number/m^2 coming from seed of Stylosanthes species established in Río Hato (Panamá)*.

Species	Seedlings/m^2
Stylosanthes hamata CIAT 118	6160
Stylosanthes hamata CIAT 147	416
Stylosanthes sympodialis CIAT 1044	2976
Stylosanthes scabra CIAT 1047	176

* Observation made at the begining of the rains.

but equally produce sufficient seedling stand as to keep a good ground cover. Seed quality of these species can be derived from these observations as well.

BRACHIARIAS

Ended durind this report period the evaluation of 21 Brachiarias ecotypes in Gualaca and Finca Chiriquí. Table 6 shows yield variations for the two localities. A marked site effect on species production is observed, and this is associated mainly to soil chemical differences, total rainfall and presence of the spittle bug insect, that is frequent in Finca Chiriquí, but never present in Gualaca. It can be observed that the B. humidicola group together with B. dictyoneura 6133, maintain a more stable production across sites, meanwhile that other species like B. decumbens 'Comercial' is severely affected in Finca Chiriquí because of spittle bug susceptibility. B. humidicola 6707, was the most tolerant to the insect and this is reflected in the yields, besides is a species that grows well in conditions of high soil acidity and high aluminum saturation, as is the case in Finca Chiriquí.

Forage qualities of this Brachiarias are presented in Table 7, where can be seen acceptable contents of crude protein (CP). However, high variation exist with respect to stem/leaf ratio among and within species. Whereas B. humidicola 6707 has a high proportion of stems, the opposite occurs with B. humidicola 6369, that produce a high proportion of leaves, a desirable characteristic of this species. Other outstanding species such as B. dictyoneura 6133, is well balanced in the ratio stem/leaf and is closer to B. decumbens 'Comercial', but protein quality of the latter is superior.

Table 6. Dry matter yields (ton/ha) of 21 Brachiarias species in Chiriquí Province. Panamá, 1986.

Species		CIAT No.	Yields (ton/ha)	
			Finca Chiriquí*	Gualaca**
1.	B. humidicola	6707	2.03	2.64
2.	B. humidicola	675	1.91	2.78
3.	B. humidicila	682	1.72	2.29
4.	B. humidicola	6705	1.69	2.34
5.	B. humidicola	6709	1.44	2.55
6.	B. humidicola	679	1.42	2.55
7.	B. dictyoneura	6133	1.41	2.19
8.	B. humidicola	6369	0.89	2.36
9.	B. brizantha	6012	0.72	1.75
10.	B. decumbens	Control	0.62	2.53
11.	B. decumbens	6131	0.52	1.44
12.	B. ruziziensis	654	0.49	1.58
13.	B. decumbens	6132	0.47	1.68
14.	B. ruziziensis	6130	0.44	1.66
15.	B. ruziziensis	6291	0.41	1.72
16.	B. brizantha	664	0.39	1.74
17.	B. ruziziensis	6419	0.29	1.72
18.	B. brizantha	6298	0.29	1.94
19.	B. ruziziensis	6134	0.25	1.79
20.	B. brizantha	6009	0.25	1.58
21.	B. eminii	6241	0.05	1.84

* Means of 8 cuttings every 42 days (Ultisol soil)

** Means of 7 cuttings every 42 days (Inceptisol soil)

Table 7. Crude Protein (CP) content and stem/leaf ratio of Brachiaria species established in Gualaca, Panamá.

Species	CIAT No.	PC* (%)	Stem/leaf** (%)
B. decumbens	Comercial	10.1	50/50
B. decumbens	6132	9.4	70/30
B. decumbens	6131	9.2	80/20
B. brizantha	6298	9.1	56/44
B. brizantha	6009	9.1	64/36
B. brizantha	6012	8.8	56/44
B. brizantha	664	9.9	57/43
B. ruziziensis	6130	9.8	67/33
B. ruziziensis	6291	9.3	74/26
B. ruziziensis	654	9.9	72/28
B. ruziziensis	6419	9.9	66/34
B. ruziziensis	6134	9.0	68/32
B. humidicola	6709	9.1	31/69
B. humidicola	6707	9.2	38/62
B. humidicola	679	9.1	34/66
B. humidicola	6705	9.4	34/66
B. humidicola	675	9.2	32/68
B. humidicola	682	9.2	39/61
B. humidicola	6369	8.5	83/17
B. dictyoneura	6133	9.2	52/48
B. eminii	6241	10.0	54/46

* Means of three-cuttings every 5 weeks during the rainy season

** One observation during the rainy season

FUTURE PLANS

The establishment of seed multiplication plots of promising species continuos to be a priority the following months. The species *S. guianensis* 184, *C. macrocarpum* 5062 and 5434, *C. acutifolium* 5278, *B. dictyoneura* 6133 and *B. humidicola* 6369 and 6707, are considered as more important within the group of new pasture species with potential for Panamá. Similarly, the implementation, namely replanting and setting up internal fences in grazing experiments in Calabacito and Finca Chiriquí, are inmediate activities. Arrangements are made for the establishment of a fertility adjustment trial for teaching purposes in Fca Chiriquí. On the other hand, trials on herbicide control of the grass weed Cabezona (*Paspalum virgatum*), Helecho (*Pteridium aquilinum*) and shrubs are in the first order for the localities of Chepo, Gualaca and Volcán.

II. GENERAL AGRONOMY

MARK GASKELL, Ph.D

RE. QUARTERLY REPORT N°. 17

PROGRESS REPORT

for the period

July 1, 1986 - September 30, 1986

Dr. Mark Gaskell, Agronomist

BACKGROUND

Work activities during the reporting period were concentrated in the onion research program in the highlands. The onion research program is a relatively new program, initiated by IDIAP under Dr. Gaskell's direction in 1983. In Panama, onions are produced primarily in the highland areas around Boquete and Cerro Punta and in the lowlands areas around Chitre and Los Santos. Production of onions in Panama has traditionally been limited to a harvest period during the dry season from February to May. Since the beginning, the onion research effort has concentrated on improving onion production during the rainy season as a means of expanding production opportunities for Panamanian producers and decreasing onion imports.

In August, of 1985, IDIAP assigned a new researcher, Ing. Esteban Sanchez, to work in the onion program in the highlands. Since that time, Dr. Gaskell has been working closely with Ing. Sanchez to familiarize him with the predominant onion production patterns, with some of the limiting factors in onion production in the area, and with the general focus of the research program. Ing. Sanchez has taken primary responsibility for the onion program beginning with the 1986 Annual Plan. Dr. Gaskell will continue to collaborate on several onion experiments and to provide advice and guidance in the management of IDIAP's western region crops research programs and the highlands vegetable research program specifically.

ACTIVITIES DURING THE REPORTING PERIOD

Opening of New Area Office - Boquete

On July 1, IDIAP opened a new area research office in Boquete in the facilities of the Agricultural and Industrial Cooperative. The onion research program was formally transferred from Cerro Punta to the Boquete area and the new area will be headed by Ing. Sanchez with the assistance of Agr. Campo Serrano and with the collaboration of Dr. Gaskell.

The opening of the new office signals a change from IDIAP's traditional research relationship with producers. In other areas, IDIAP has in the past and continues to conduct on-farm research with very positive results in most cases. The new program in Boquete, comes in response to a positive image which producers in the area have of the onion research program as a result of nearly three years of onion research - all on producer's farms.

The program revolves around a formal memorandum of understanding between IDIAP and the AGRICOLA and HORTICOLA cooperatives in Boquete and provides for the two cooperatives to actively financially support the research program established by IDIAP in the area. A Research Advisory Committee has been established to guide and support the research program. The committee is composed of one representatives from each cooperative and two from IDIAP, with Dr. Gaskell serving as an advisor. IDIAP assigns personnel to be permanently stationed in the area and the two cooperatives provide office facilities, transportation, and research materials and supplies. The research program follows the guidance of the Research Advisory Committee and ultimately is accountable to the Committee, the cooperative membership, and to IDIAP with research results that respond to priorities established by the Committee.

The new collaborative program is a potential solution to the budgetary and political instability that have plagued many of IDIAP's research programs in the past. With the support of the membership of the two coops, it is assumed that a more stable program can be established which truly addresses the needs of producers. The agreement also implies additional responsibility and accountability on the part of the research program. If the program produces technology that is important to area producers, they will be supportive and if it fails to respond to these needs, support will diminish.

Identification of New Research Priorities

The Research Advisory Committee has met regularly during the initial three months of the new program and has established future priorities for the research program. These new priorities center around the perceived opportunities that exist for continued improvement of rainy season onion production and for additional vegetable crop diversification - particularly during the rainy season. The research effort will continue to try to improve onion production efficiency generally and rainy season production specifically. The recent opening of the market to unrestricted importation of onions (with an annually diminishing import tax) means that the market is free to respond to supply and demand signals but more importantly, that producers will be able to plan for importation and know what to expect with regard to import competition. The potential exists for Panamanian producers to compete freely with imports but much work remains to improve the efficiency of area producers - particularly during the rainy July to December period when domestic production is most difficult and imports are relatively inexpensive.

Additional opportunity exists for vegetable crop diversification in the highlands and based on marketing opportunities as percieved by the HORTICOLA marketing cooperative, broccoli, cauliflower, and table tomatoes have been identified as crops where a research effort could have a high payoff for area producers. The marketing cooperative has a demand for broccoli and cauliflower which is in excess of supply much of the year and tomatoe supply is very low during the rainy season. Therefore, a new effort is being initiated on recommendation of the Research Advisory Comittee to investigate the critically limiting factors in year-around production of broccoli and cauliflower and the possiblilites of improving rainy season tomatoe production.

On-going Research - Onion Agronomic Problems

Several onion experiments were harvested during the reporting period. An experiment to evaluate the role of nitrogen and phosphorus fertilization in rainy season onion production was harvested from the Cheva farm in El Salto in late August. This experiment was a result of exploratory experiments conducted on the same farm in 1985 and suggestions made by Dr. Alvaro Cordero, the Rutgers Soil Scientist stationed in Santiago and IDIAP researcher Ing. Benjamin Name during their visit to the area in 1985. The results are shown in Figure 1.

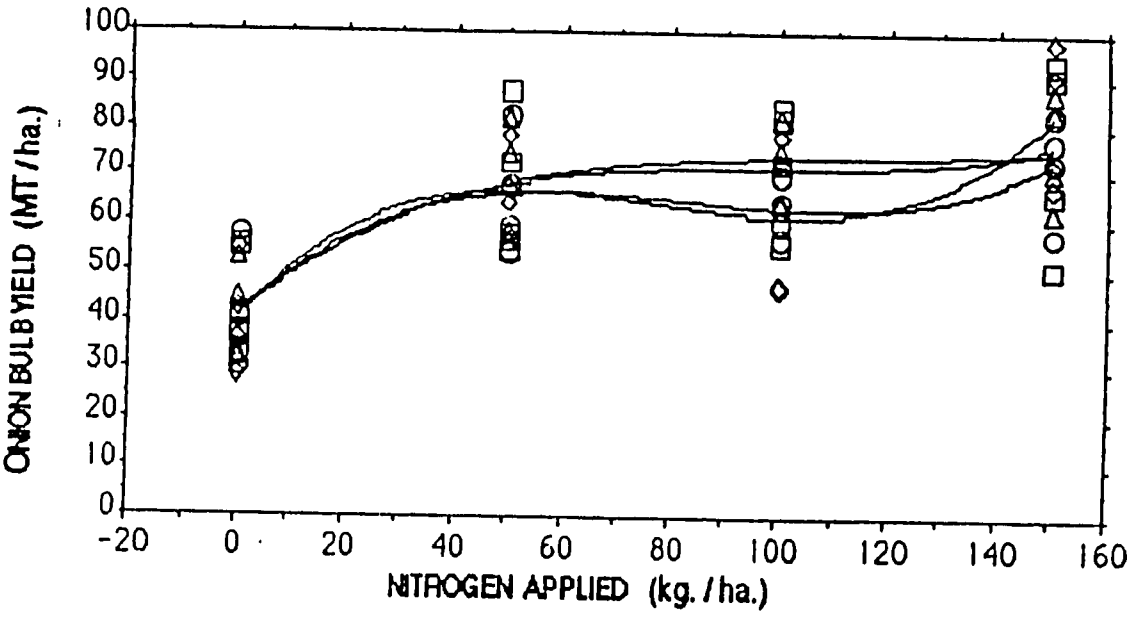

Figure 1. Yield response of rainy season onions to nitrogen (N) and phosphorus (P) fertilization. Harvested September, 1986 Cheva Farm, Boquete, Panama. P rates = 0 (○), 25 (□), 50 (△), and 100 (◇) kg. P_2O_5/ha.

Onions in this experiment responded positively to nitrogen fertilization and that response was enhanced by phosphorus fertilization. The application of 50 kg. P_2O_5/ha. gave the closest fit of yield with nitrogen (r^2=0.69**) but with 100 kg. P_2O_5/ha.(r^2=0.64**), the response to nitrogen appears to continue beyond the highest level included in these treatments. It is doubtful however, that these higher levels would be cost effective and the economic optimum is likely within the range expressed in this graphic response. The majority of literature suggests that 150 kg. N/ha. is sufficient for optimal onion yield and it had been hypothesized that nitrogen may actually be in excess and causing quality problems during the high moisture rainy season. These results suggest that, in fact, there may be a nitrogen response up to150 kg. N/ha. if between 50 and 100 kg./ha. P_2O_5 is band applied beneath the row prior to transplanting.

Two onion rainy season varietal trials were harvested in August and September from plots transplanted on the IDIAP experiment Station in Cerro Punta and on the Miranda farm in Callejon Seco (Boquete). The varieties in these trials represent the

most promising varieties selected from the results of trials on several farms in the highlands during the period 1983-1985. Results from these trials are presented in Table 1.

Table 1. Yield of six commercial onion varieties at two highland sites during the 1986 rainy season.

ONION VARIETY	LOCATION EXPT. STATION[1]	MIRANDA FARM[2]
	— MT./ha. —	
Granex 33	68.2	26.6
Dessex, PRR	44.3	24.8
Texas Grano 502	42.7	21.3
Yellow Granex	42.3	22.3
Tropic Brown	44.1	29.5
Texstar, PRR	44.5	–
L.S.D. (.05)	10.0	n.s.

1 Harvested September 9, 1986.
2 Harvested September 30, 1986

These results show some interesting aspects. First, they clearly show the importance of management on yield at the farm level. Varieties grown in similar climatic conditions during the same period can differ dramatically due to management. The Tropic Brown variety on the Cheva farm in the experiment shown in Figure 1 and harvested at about the same date had yielded nearly double what it did in this yield trial on the Miranda farm just a short distance away. Also, the potential relative yield advantage of Granex 33 over the other varieties was confirmed in the Cerro Punta trial and this has been observed quite consistently in other previous trials. And finally, the profitability of onion production during this rainy period is confirmed from these yield levels. Onions were selling at $25- 30 /qq (1 Mt.=22 qq.). during this harvest period and costs of production of rainy season onions have been set by the National Onion Commission at $5600 /ha.

Broccoli, Cauliflower and Tomatoe Agronomic Trials

Broccoli, cauliflower and tomatoe have been identified by the Research Advisory Comittee as priority crops for which a research effort would have a high payoff for area producers. Calendarized plantings of broccoli and cauliflower are needed to provide a continual year around harvest and much management research is needed for tomatoe production during the rainy season. Broccoli and cauliflower seedbeds were estblished on the Emerito Martinez farm in the Quiel area of Boquete in July, August and September and one transplanting has been made. The seedbeds on the Martinez farm have been established under a covered seedbed structure that is a modification of the structure which has been shown to be valuable for onion seedbed establishment. This new structure appears to also have potential for protected cropping of tomatoes during

the rainy season as well as for simple onion drying in the field. An expanded research effort in protected cropping is planned in these three crops for the 1987 rainy season.

Solar Onion Dryer Construction

In 1984, Dr. Mark Singley of the Department of Agricultural Engineering at Cook College - Rutgers University, visited Panama and subsequently designed several solar onion dryers of varying levels of sophistication. Two of those designs have been built in Panama and one is still being evaluated and modified. Some private producers have adapted and modified these designs and are using them in the highlands to dry onions in the rainy season. Following his visit to Panama, Dr. Singley developed a proposal and received financing from the New Jersey Agricultural Experiment Station to develop a more advance design solar onion dryer for Panama. That dryer has been built and was evaluated with the onion harvest in New Jersey in August and has been modified. Plans are underway for the dryer to be reconstructed in Panama in the facilities of the HORTICOLA cooperative in Boquete for evaluation under Boquete conditions during the 1987 rainy season. The photovoltaic panels and related equipment will be shipped from New Jersey and the remaining structure will be constructed in Boquete.

International Horticultural Congress

In early August, Dr. Gaskell attended the International Horticultural Congress in Davis, California and participated in the pre-conference technical tour through some of California's most important vegetable growing areas. Of particular interest in the vegetable tour were commercial operations of broccoli, cauliflower, tomatoe, and artichokes, as well as several types of post-harvest fresh produce management. The visit to the fresh herb research program at the UC-Davis experimental farms was also valuable. Many of the technical presentations were of interest and will be especially useful in assisting IDIAP to strengthen research programs in horticultural crops.

III. SOIL FERTILITY AND MANAGEMENT

ALVARO CORDERO, Ph. D

RE. QUARTERLY REPORT N°. 17

PROGRESS REPORT

DR. ALVARO CORDERO

SOIL SPECIALIST

PROYECT: AGRICULTURAL TECHNOLOGY DEVELOPMENT IN PANAMA

PERIOD: JULY 1° TO SEPTEMBER 30, 1986

A. INTRODUCTION

The activities for the Soils Specialist as in previous reports are divided in three important components:

a. Technical Assistance and Capacitation.
b. Meetings, Conferences, Seminars, Technical Field Trips.
c. Research Support.

The most outstanding activities performed are reported below.

B. TECHNICAL ASSISTANCE AND CAPACITATION

The Soil Specialist delivered to I.D.I.A.P. a document about the Sub-program for Evaluation and Soil Fertility Improvement focussed on research and services. The document was presented to I.D.I.A.P. as a basic proposal for the development of the sub-program for Soil Fertility, under the IDIAP Soils Program. The document was prepared by Eng. Benjamín Name, IDIAP Soil Specialist for the Central Region and Dr. Alvaro Cordero, Soils Advisor of Rutgers University proyect ATD in Panama. The document consists of four (4) chapters. Chapter 1 summarized all the antecedents and the institutional situation of Soil Fertility in Panama.

Chapter 2 propose what the sub-program of evaluation and improvement of the Soil Fertility should be. This chapter present an organigram, define the problematics and objectives of the sub-program. In this chapter the Methodology for laboratories studies, Field and Greenhouse research is defined with the intention of fulfilling our targets which we hope to accomplish in the short and long term. This chapter gives the need for capacitation of the personel of Soil Fertility sub-program. Also described are the laboratory facilities, seasons and experimental fields available.

At the end of this chapter we present the achievements reached by IDIAP in reference to Soil Service for farmers. Also the Soil Analysis Studies, the guide to interpret soil analysis and recommendations about crop fertility levels using the soil analysis.

Chapter 3 describe the perspective for 1992, once reached the short and long term goals, the sub-program be transformed into a National level program of "Soil Fertility" with 3 definite stages to develop. In the year 2,000, it will be possible to give recommendations about pastures and crops fertilization and amendments based on mathematics models. Chapter 4 presents all the literature consulted. Technical Assistance was also given to individual IDIAP experts and staff as requested. The assistance given emphasised, primarily in planning, implementation and discussion of results about Soil Fertility, and crop, pastures, mixed cropping fertility programs.

The collaboration was more intensive on research carried out in the Experimental Station of Calabacitos, with Eng. Name, to find alternatives for Acid Soil Management. During the month of September I took charge of the Acid Soil Investigation of Eng. Name, because he left to participate in the Management of Tropicals Soils/Latinamerican Workshop in Yurimaguas, Peru, during the month of September 1986, sponsored by I.N.I.P.A.-PERU, NCSU and Copatrocinated by USAID and the I.I.C.A.

Technical Assistance was also provided to the Roots and Tubers Program in Ocu that is directed by Eng. José A. Aguilar, in the fertilization trials in Yuca and Corn/Yuca associations.

Individual assistance was also given to Eng. Esteban Arosemena, Pastures Specialist, for the legume fertilization experiments. In some proyects we even assisted with the fertilizer calculation for the differents experimental treatments.

Special attention was also given to the Soils Laboratory in the organizing part, because of two situations:

1- The compromise by I.D.I.A.P. to analyze, for Soil clasifications studies, samples mailed by CATIE from Coffee and Cocoa areas of Panama and

2- The damage of the atomic absortion equipment. To correct this problem different meetings were held with Regional Director Eng. Sanchez Diez and Eng. Name, Jaramillo and Lic. Sing, to find solutions for the efficient opperation of the Soils Lab, considering the existent problems.
Individual assistance was also given to Eng. Ezequiel Espinosa, Agronomy Faculty of Panama University and IDIAP Ex-general Director.

Joined by Eng. Eric Batista in Chiriquí, in the planning of fertilization exp. for dosis of Phosporus (0,30,60,90 and 270 kg of P_2O_5/ha) in two promisory lines, 1537 and 1048 in Alanje, Chiriqui in soils low in P and with high fixation capacity for P. Eng. Luisa Martinez, of IDIAP Experimental Field in Los LLanos de Cocle, was also assisted with statistic calculations of experimental results of a factorial by Nitrogen source, in rice. We also disscused the results and gave collaboration to Eng. Martinez, in her presentation at the IDIAP Scientific Meetings of the experimentals results.

Review of various documents was also important as in previous quarters:

Review of a proposal on irrigation research presented by Eng. Lourdes Charles, within IDIAP'S Soil Program. This advisor made a meticulous and exhaustive review of the proposal and made several suggestions in writting for improvement of the documents.

Also Eng. Name presented for reviewing the proposal "Investigation of sorghum in Acids Soils", submitted by Eng. Name to IDIAP Directors with the purpose of looking after external funding.

Also, we attended the request for review of three abstracts published in the IDIAP Scientific Meetings, 1986. The principals authors of each abstract were: Eng. Luisa Martinez, Eng. Esteban Arosemena and José Antonio Aguilar.

The specialist also attended a request from the editors of Turrialba Journal to review two articles for evaluation and approval. Other important review was the Strategic Plan Draft 1987-1992 for the Agricultural Technology Development Proyect in Panama. The Chief of Party of Rutgers ATD proyect in Panama received the respective commentary.

C. MEETINGS, CONFERENCES, SEMINARS, FIELD DAYS, ETC.

During July to September, became involved in field work extensively to prepare for evaluation tours and field demonstrations. Also the soils advisor was in charge of experiments in the Experimental Station of Calabacito, during the month of September, on Acid Soils Management. Other visited areas was in Ocu-Herrera to the Roots and Tubers Programs and in the Experimental Field of Penonome, we gave assistance with the fertility investigation in rice. Lolá de Las Palmas was another visited area with the purpose to give continuity to the fertilization experiments and liming in Piña.

Another visited area during this period was Chiriqui in Alanje and the Experimental Farm of the Agricultural School of Panama University, with the purpose to collaborate with fertility investigations in rice conducted by IDIAP with CIAT and the University of Panama in the Rice Improvement Program. Other relevant activities are described below:

- To attend Dr. Robert Tate, Soils and Crops Dept. of Cook College-Rutgers University. He was given all the support, for the purpose of taking samples of soils, for his Nitrogen Proyect. Three sampling areas were visited in the Eastern region:

  a) Asentamiento Campesino in Chepo
  b) The Experimental Sta. of IDIAP in Chichebre
  c) The Hilly Zone-Road to Los Llanos de Cartí, San Blas District.

For every one of the visited zones samples were taken of different soil profiles and soil management. Dr. Tate, expressed his satisfaction for the succesful Mission. Eng. Cruz Miranda (IDIAP) was present in this tours and collaborated actively.

- At the Experimental Station of Calabacito and the Soil Laboratory in Divisa we attended to the Evaluation Group of A.I.D.: Drs. Drga, J.J. grant and R. Waugh.

- One of the most important technical tours during the period, was realized to the Zumbona Area in South of Soná. This tour was joined with MIDA'S experts, Eng. Augusto Fernandez, Mariana Palacios Hernandez and Dr. Alvaro Cordero. The main reason of this visit was to evaluate the bad development of fields sown with rice by the farmers. An evaluations led to the consensus between the experts, that the principal problem was presence of weeds and its competition; lack of control, principally of "Comelina", was owed that the farmers did not follow the recommendations given by IDIAP.
  The Soils Assessor during his visit also visualized other problems, like sulphur defficiency. It was recommended to the IDIAP resident to take samples of soils at two depths 0-20cm and 20-40cm in the dry season (December-April), to conduct Greenhouse studies.

A technical tour to the Experiment Station of Calabacito, was conducted to the Chief of Cooperative Extension from Rutgers University, Dr. J.J. Kupcho. His visit was pleasant and after observing the investigation activities that the soils specialist is providing advise, he showed

satisfaction with the objectives and goals of the research carried out in Calabacito, the investigation center for acid soils management, of Panama.

During the Scientific Meetings participated in Technical Tours at Experimental Camp in Penonome and in the Experimental Station of Calabacitos, and dictated a conference, to about 50 persons on the "Importance of the Acids Soils Investigation". Also collaborated with Eng. Name, to showing the visitors, and the field experiments. Also, during the Scientific Meetings together with Eng. José A. Aguilar presented a paper on "The Yuca response (Manihot Esculenta Grantz) to dosis of N, P, K and liming".

Other conference was "Phosphorus fixation in Soils of Alanje-Chiriqui" and topics about "The Nitrogen Fertilization of Rice". The two conferences were presented to the Latinamerican group of students at the "International Course of Rice", dictated and organized in CIAT, Colombia in the technical tours, conducted to the Republic of Panama. In this technical tours was useful to present to the Latinamericans Scholars, the experiment "P Fertilization in 2 promisory lines of rice (1537 and 1048) in Soils of Alanje-Chiriquí". In this research, the Soils Specialist, collaborated with Eng. Ezequiel Espinosa, University of Panama and Eng. Eric Batista-IDIAP.

During the quarter participated in several other meetings. Principally, with the Central Region Director and his advisory group, in the Regional Executive Council, to search for solutions of the Soils Laboratory of IDIAP in Divisa. Also participated in the disscussion (per three days) of the draft of the Strategic Plan /ATD proyect with the Central Region Director and Advisory group.

At that time the evaluators group of AID for the ATD project was present in the region (Drs. D. Drga, J.J. Grant and R. Waught) participated with them and with the experts in disscussions about the ATD proyect impact in the Region, and regional priorities for agronomical and livestock research.

We attended Dr. Rose Mary Silvester Bradley, Soils Microbiologist of CIAT and organized a meeting with Eng. Esteban Arosemena and Lic. Rodolfo Morales, with the objective to Plan Rhizobiology Studies, at the Laboratory and Greenhouse levels to be directed by Lic. Morales and field research conducted by Eng. E. Arosemena.

We used the opportunity of the visit of Dr. Robert Tate to discuss with Drs. J. Jonas and J. Espinosa of IDIAP and with Drs. C. Neyra and A. Cordero of Rutgers-Team the following topics: a) Soils Program, b) Soils Fertilization Sub-program, c) Investigation of the Fertilization Quality Control, in Panama.

1. RESEARCH

Great support to Soils Research and Fertilization of Crop and Forestal Species, was given by the Soil Assessor to IDIAP.

In July 10, 1986 and after eleven months in the field the experiment on "Adaptation of twelve varieties of Yuca in Acids Soils" was harvested. Principal Investigator: Eng. B. Name-IDIAP, Collaborator: Dr. Alvaro Cordero Rutgers University. Six varieties of those harvested were identified as promising for Acids Soils:

VARIETY

DAYANA
ACU 2096
BRASILEÑA
GIGANTE
LA BLANCA

CM1 91-3

In view of the success with this six Yuca varieties, seven days after and using the fresh vegetative material, another experiment was laid out on a latin square design 6 x 6. The principal investigator is Eng. B. Name and Collaborator Dr. Alvaro Cordero, Rutgers University.

In July 29 an experiment was sown using 8 outstanding varieties of Guandú (Cajanus Cajan) harvested in 1985. It was laid out using random blocks with four replications, to evaluate the following material:

T-21	SC -8002
L-3A	SC -8003
6A 28	SC -8005
6A 16A	SC -8006

This investigation is directed by Eng. Benjamín Name of IDIAP and Collaborators: Dr. Alvaro Cordero Rutgers University.

In early July another experiment was planted to evaluate adaptation to Acid Soils of eleven lines of Malanga:

MM7377	MM6117	MM7331
MM7239	MB7364	MM6081
MM6561	MM10869	MM8987
MM6315	MM7361	

- "Other Research: Management of phosphorus in Corn Grown in Acids Soils". Principal Investigator: Eng. Benjamín Name, Collaborator: Dr. Alvaro Cordero, Rutgers University IDIAP.

- "Liming and Fertilization of Pineapple in Acids Soils". Location: Lolá de Las Palmas-Veraguas: Principal Investigator: Eng. B. Name. Collaborator: Agr. Nelson Gratacos-MIDA and Dr. Alvaro Cordero, Rutgers University-IDIAP. The experiments included an evaluation of the hormone ETREL on flowering of Pineapples.

- Fertilization Experiments in Yuca: a) Dosis Studies of N and P, b) Aplications times of N and c) Liming. Principal Investigator: José A. Aguilar-IDIAP, Collaborators: Eng. Benjamín Name-IDIAP and Dr. Alvaro Cordero, Rutgers University-IDIAP.

- Phosphorus Fertilization in the Yuca-Corn Association in Ocu. Principal Investigator: José A. Aguilar-IDIAP, Collaborator: Dr. Alvaro Cordero, Rutgers University-IDIAP.

- Phosphorus Fertilization in Two promising lines of rice (1537 and 1048). Principal Investigators: E. Espinosa, Faup and E. Batista, IDIAP. Collaborator: A. Cordero, Rutgers University.

- Adjustment of Fertilization for the Andropogon gayanus Associations CIAT 621 and Centrosema macrocarpum-CIAT 5062. Principal Investigaros: Dr. Alvaro Cordero and Pedro Argel, Rutgers University-IDIAP. Collaborators: Eng. B. Pinzón and R. Montenegro-IDIAP. The experiment was replicated in the Experimental Station of Calabacito. Principal Investigators: Dr. Alvaro Cordero, Pedro Argel, Rutgers University-IDIAP and Eng. B. Name-IDIAP. Collaborators: Eng. Esteban Arosemena-IDIAP.

- Rice Fertilization Experiments in Los Llanos de Penonome: a) Source and Nitrogen Dosis, b) Differents Nutriments Studies Co, Mg, S, P and minor elements. Principal Investigators: Eng. Luisa Martinez-IDIAP, Benjamín Name-IDIAP and Collaborator: Dr. Alvaro Cordero, Rutgers University-IDIAP.

- Kudzú Fertilization Experiment (Pueraria phaseoloides): Dosis studies of P, S and Mg in one Acid Soil of Calabacito. Investigator: Eng. Esteban Arosemena-IDIAP, Drs. Pedro Argel and Alvaro Cordero, Rutgers University-IDIAP. Collaborator: Eng. B. Name.

- Evaluation of 60 lines of Soya in Acids Soils of Calabacito. Investigator: Eng. Benjamín Name-IDIAP, Collaborator: Dr. Alvaro Cordero, Rutgers University-IDIAP.

- Species Forestals Adaptation in Acid Soils. Principal Investigator: Eng. Benjamín Name-IDIAP. Collaborator: Eng. Blas Morán of CATIE, Engs. Amable Gutierrez, Luis Pittí of RENARE and Alvaro Cordero, Rutgers University-IDIAP.

- Agrosilvo Pastoril Association. Principal Investigator: Benjamín Name Collaborator: Eng. Blas Morán of CATIE, Eng. Luis Pittí-RENARE and Alvaro Cordero, Rutgers University-IDIAP.

E. OTHER ACTIVITIES

With Dr. Pedro Argel of Rutgers Team, worked in the Seminar Workshop Coordination about "Tropicals Acids Soils Management, for the Pastures Settlement" celebrated in Panama, November 10 to 14, 1986, sponsored by IDIAP-RUTGERS-CIAT.

It was prepared the quarterly report for April-May-June.

ALVARO CORDERO
December 1986.

IV. LIVESTOCK RESEARCH AND PRODUCTION

JOSE ZORRILLA-RIOS, Ph. D

RE. QUARTERLY REPORT N°. 17

REPORT OF ACTIVITIES: BY DR. JOSE ZORRILLA, LIVESTOCK PRODUCTION SPECIALIST WITHIN THE AGRICULTURAL TECHNOLOGY DEVELOPMENT PROJECT OF THE UNIVERSITY OF RUTGERS, FOR THE AGRICULTURAL RESEARCH INSTITUTE OF PANAMA.

REPORTING PERIOD: JULY, AUGUST, SEPTEMBER, 1986.

This report for the third quartely period of the year (July, August and September) contains description of activities conducted on the following areas:

I. Research

II. Institutional support

I. RESEARCH ACTIVITIES.

Includes the following experiments:

I.1. Estrategic supplementation to dual purpose cows. This trail was established at Calabacito Experimental station on July. Its main objective is to study any residual effect on milk production by supplementing cows the first ninety days of lactation. The treatments are: 1. control, no supplement. 2. Molasses-urea supplement and 3. Protein bank from a legume (Kudzú, *Pueraria phaseoloides*). All cows graze on a pasture of *Bracharia humidicola*. At the end of September, information has been collected on nine

.../...

cows (three per treatment. A partial summary of results is presented in Table 1. This experiment is planned to end by December '86, January '87, depending on availability of animals.

I.2. Use of fishmeal as a supplement to dual purpose cows.

On farm research in the area of Ocú, Veraguas. It was intended to evaluate the effect of supplementing to lactating cows, grazing on native grass with fishmeal plus a supplement of molasses-urea ad libitum (the conventional practice at the farm). Response will be measured in terms of milk yield and reproduction activity. An economic evaluation will be performed at the end of the trial (December '86).

I.3. The use of a protein bank of Centrosema macrocarpo on the rearing of suckling calves during the dry season, within a dual purpose system. On farm research at Ocú, Veraguas Province, in collaboration with the specialist on pastures and forages of the ATD project, Dr. Pedro Argel. The seeding of the legume was done on September, on an area of aproximately 8000 m^2. This plot will be grazed

.../...

as a protein bank by suckling calves, plus a grass (Digitaria swazilandensis), as compared to calves grazing the same grass only. Agronomic, animal performance and economic evaluations will take place during an initial stage of aproximately six to nine months, depending on pasture establishment and persistance during the dry season.

II. INSTITUTIONAL SUPPORT.

These activities will be grouped as:

II.1. Visits to/from producers and/or agricultural scientists.

II.2. Workshops, seminars participation.

II.3. Other activities

II.1. Visits to/from producers and/or agricultural

Six visits to producers (dual purpose or beef cattle) were conducted. Three in the Azuero area, two in the Veraguas Province and one in Colón Province. The main purpose of these visits has been to attain a better understanding on production systems, limitations according to producers criteria and to establish a relationship with producers who may be interested in collaborate in the future with our research

.../...

program. With two of these producers, it has been posible to obtain their herds production/reproduction records for analysis. Contact was made with the staff of the Agricultural Institute Jesus Nazareno, in Atalaya, Veraguas. Collaboration on seminars and talks was requested on their behalf and their willingness to share the production/reproduction data on their especialized dairy herd.

In four different occasions, the visit of scientists/consultants was attended. Dr. J. Simpson, from the University of Florida, coordinator of the Ralgro/IMC/IDIAP project. After a request of the Agricultural Division of AID/Panamá Mission, an economic evaluation to estimate cost of production of beef was conducted with his assistant, on one producer at the Chiriquí Province. Also from U. of Florida, Dr. Lee R. McDowell, a nutritionist of cattle in tropical areas of Latinamerica, spend three days at Panamá, as a follow-up on our talks at ALPA meeting held last April

.../...

in Mexico. Dr. McDowell had the opportunity to visit an area where a mineral defficency problem is pressumed to exist, talk with a producer and some Panamenian Technician with some experience on the matter. He also visited IDIAP Experimental Station at Calabacito and the National Agricultural Institute (INA), at Divisa.

During his visit, areas for cooperative work were indentified and a proposal was elaborated. This proposal has already being summitted to IDIAP and AID/Panamá authorities. The main objectives are to analyse commercially available mineral mixtures and ingredients in Panamá, the development of practical, low-cost, mineral-boxes that would reduce/eliminate some of the major limitations on mineral supplementation programs for grazing animals in the tropics: waste /spoilage due to rain and/or wind, and high frecuency of supplementation to achieve a regular supply.

From the Extension Department of Rutgers University, Dr. J. Kupcho visited the Region

.../...

and interviewed with IDIAP staff. His Departamental involvment in the ATD project is expected to fullfill an important need by the Livestock Specialist in performing his activities directly with the producers. Finally, a Consultant Team for AID, made by Dr. J. Grant and Dr. R. Wough, spent two days at the Central Provinces area, interacting with IDIAP staff and visiting facilities in the area.

II.2. Workshop/Seminar participation.

- There were two participations in seminars. One to MIDA extension staff, on the use of paddock management records and their application to develop a farm feed-budget. The second talk was addressed to producers, and it dealt on the topic of alternative feeding and management strategies to reduce the effect of the dry season on animal performance, maintenance and/ or survival.
- During IDIAP Aniversary celebration, assitance was given to three IDIAP researchers on their presentations of experimental results on

.../...

activities performed during the present year. Two abstracts were included in the Proceedings. The titles of the oral presentations were:

* Improvement of the nutritive value of low quality forages by the applications of urea solutions. By Ing. L. Tasón.
* Performance of a dual purpose herd grazing Bracharia humidicola. I. Comparative effect of an energy supplementation vs a protein bank of Pueraria phaseoloides (Partial results). By Ing. E. Arosemena.
* Reproductive parameters of a commercial beef herd on the Coclé Province. By M.V.Z. Jaén.

II.3. Other activities.

- Two meetings with the Faculty of Sciences, University of Panamá, MIDA and BDA took place to discuss the planning of an inter-institutional project to assist dual purpose and beef cattle producers to increase their productivity. It is intended to closelly monitor a number of commercial herds, identify constrains, priorities them and

.../...

implement some action to reduce/correct them.

- Due to an irregular rainy season this year, a severe shortage of feed (pasture) is expected for the comming dry season. Therefore a manuscript was prepared on alternative feeding and management estrategies for cattle during a drought, and submitted to IDIAP and the National Livestock Program of MIDA for their consideration.

V. AGRICULTURAL RESEARCH ADMINISTRATION AND MANAGEMENT

CARLOS A. NEYRA, Ph. D

RE. QUARTERLY REPORT N°. 17

ADMINISTRATION AND MANAGEMENT OF AGRICULTURAL RESEARCH

Carlos A. Neyra, Ph. D.

PERIOD: JULY 1° TO SEPTEMBER 30, 1986

The ATD project and Rutgers University are providing since February, 1985, the services of an Agricultural Research Administration and Management Specialist in Panama. This specialist provides technical assistance for the purpose of helping improve resource use and the overall management and administrative capacity of IDIAP. The specialist is also acting as a Chief-of-Party of a five persons research team placed in country by Rutgers University as part of the Technical Assistance component of the ATD proyect.

The activities report of the Ag. Research Adm. Mgt. Specialist for this quarter, are organized according to the following specific goals:

A. "To assist IDIAP in the formulation and implementation of institutional objectives, strategies, priorities and evaluation of agricultural research".

B. "To act as a Chief-of-Party and in-country coordinator of the technical assistance provided by Rutgers University to the ATD proyect in Panama".

ACTIVITIES

GOAL: "To assist IDIAP in the formulation and implementation of institutional objectives, strategies, priorities and evaluation of agricultural research".

A.1. ATD Project: Strategic Plan, 1987-1992.

A.1.a. Rutgers: On-Campus Consultations.

During this quarter, the Ag. Research Adm. and Management specialist was called back to Rutgers for a period of 10 days (July 13 to 23) for a second round of discussions and consultations on issues related to the preparation of the written report on the "Strategic Plan for the Agricultural Technology Development Proyect in Panama, 1987-1992". A working team was implemented at Cook College that also included:

Dr. Carlos A. Morán, General Director of IDIAP, Marcos Navarro, Jefe del Sub-Centro de Azuero IDIAP and Pedro Argel, a team member of the Rutgers Technical Assistance in Panama. The report on the "Strategic Plan" was prepared based upon the discussions, data collection and conclusions reached by a multidisciplinary study team made by representative researchers from IDIAP and Rutgers that met together in Panama through the month of June, 1986. The document/report on the Strategic Plan was officially presented to USAID/PANAMA and to IDIAP on August 1°, 1986, as promised.

Eventhough, the Strategic Plan reflects quite accurately the conclusions reached by the Study Team implemented in Panama, it is worth mentioning that this document in its current version (August 1°) represent only a first stage of a process that must be continuous and subject to adjustments, actualizations or changes when and if shown valid, necessary and in consonance with institutional realities and sector policies. However, it is also worth mentioning that the Plan constitutes per se a very serious analytical effort that can be taken as a "reference document" to define goals and priorities for agricultural research to be conducted in the next 5 to 10 years.

A.1.b. Strategic Plan and Priorization: IDIAP

The process of research priorization is a very dinamic and continuous activity undertaken to help otimize the efficiency of utilization of available resources. The order of priorities must be established following a rather pragmatic criteria based on the recognition of:

1. The occurrence of differente systems of agricultural production and the need for improvement to enhance production efficiency.

2. The existance of limiting agro-ecological factors to reach the maximal production potential in Panama.

3. The limited availability of human, physical and economic resources to attain the goals defined by IDIAP and the agricultural sector in general.

4. The existing limitations to adequately commercialize agricultural products within the domestic and export markets.

The Strategic Plan identified two areas, Horticultural Crops and Livestock products, with high priority for resources allocation and research activity. The choice of Horticultural Crops was based on the exceedinglly good possibilities for economical benefits for some species

together with the existance of a great demand from exporting markets. Similarly, the Plan reveals the existing possiblities to increase productivity and decrease costs of production in the near future for beef and milk making Panama able to enter competitively in the export market while at the same time benefit with largers gains in the domestic market.

The process of discussion and analysis of the Strategic Plan within IDIAP apparently leads to the conclusion that Horticultural Crops and Livestock production are highly prioritary activities but IDIAP also considers the need to include other commodities in the high priority list, among those are: basic grains, roots and tubers. The process of discussion and analysis mut lead to a more rational definition of priorities and use of available resources.

A.2. Evaluation of the Agricultural Technology Development (ATD) Project.

The terms of reference for the evaluation of the ATD project and selection of an evaluating team were prepared by USAID/Panama based on an initial draft elaborated by D. DRGA and F. Pope of USAID/Panama and Carlos A. Neyra, Chief-of-Party. Subsequently, the Research Adm. and Mgt. Specialist (C. Neyra) prepared a working document to help IDIAP get ready for the incoming evaluation.

The process of evaluation took place during the months of July, August and September, 1986 by a team made of six members: M. Sarles, J. Sussman, J. Grant, K. Burns, J. Claire and R. Waugh. The team was able to prepare and share at least 4 draft versions of the Executive Summary and 2 versions of the entire document. The evaluation also included the Agricultural Technology Transfer (ATT) project.

In relation to the ATD project, all the Technical Assistance team members from Rutgers were interviewed as well as the Administration and individual researchers of IDIAP. The specialist in Research Adm. and Management had the opportunity to meet with all the members of the evaluation team in at least 6 opportunities to discuss aspects related with:

- Programs and approaches of the Research at IDIAP
- The Technical Assistance provided by Rutgers to IDIAP.
- Relations between the ATD and ATT projects (Generation and Technology Transfer, respectively).

The specialist in Administration and Chief-of-Party of Rutgers had the opportunity to review and suggest modifications in at least three version of the Executive Summary and a draft from the final

document. In addition, he attended several Rapport sessions made by the Evaluation team to IDIAP, MIDA and USAID/Panama.

Among the most important recommendations in the Evaluation report are the following:

1. IDIAP mut concentrate its research efforts IN ADAPTIVE type of research and emphasize even more on the Farming Systems methodology applied on Farmer Fields.

2. IDIAP needs to concentrate efforts on an smaller member of commodities and research activities and define the research priorities more rigurously. The repport suggested taking as a reference for priorization two documents recently prepared with the participation of experts from Rutgers, ISNAR and IDIAP and published as the "Strategic Plan for the ATD project in Panama" and the report entitled "Identifying opportunities to improve Agricultural Technology Management Systems in Latin America: A methodology and test case". Personally, I think IDIAP has made efforts to define priorities for research in several occasions and the Annual Plan of Activities (POA) of IDIAP is a formal guiding exercise of great value.

3. Counterpart funding from the Government of Panama must be made available on time and if possible in anticipation of the required expenditures for research.

4. IDIAP must make a real effort to increase the annual budget for operational expenses to improve research implementation.

5. The team recomended the continuation of the Technical Assistance provided by Rutgers Specialists. The evaluators concluded that this Technical Assistance has been effective but may be improved. The best two examples are found in the Horticultural Program (Onions, particularly) and in Tropical Pastures. They also expressed confidence that the Technical Assistance in Livestock production and management will be equally succesful.

6. One of the most important recommendations was to improve Coordination and Cooperative action between the two projects: ATD and ATT. Efforts on this lines have already been initiated between working groups of MIDA/Technology Transfer and IDIAP/ Technology Generation.

B. GOAL: "To act as a Chief-of-Party and in-country coordination of technical assistance provided by Rutgers University to the ATD project in Panama.

ACTIVITIES

The Ag. Research Adm. Mgt. specialist used about 50 percent of the effective time in activities related to its function as a Chief-of-Party and overall Project Coordination. These activities can be grouped as follows:

1. Keeping records of activities and reports for each member of the Rutgers Technical Assistance team.

2. Review and editing, in Spanish and English, of the quarterly reports and work plans prepared by the TA team.

- Organization of Report N°16 for the period from April 1° to June 30, 1986.

3. Participate an assist with the coordination of visits to Panama by Rutgers faculty as part of the backstopping efforts to the ATD project and related activities.

- Coordination of a visit for research purposes by Dr. Robert Tate III, Associate Professor of Soils and Crops, Cook College. The main objective of the visit was to take soil samples from soils of different degrees of evolution and use and vegetation cover for the purpose of studying the "Dinamics of Nitrogen in Panamamian Soils.
  This opportunity was also used to hold meetings with Soils experts from IDIAP and Dr. Alvaro Cordero (Rutgers TA member) to discuss on: a) Advances in the development of a National Soils Program; b) Research on Soil Fertility and c) Soil acidity and micronutrients toxicity.

- Coordination of a visit made by Dr. J.J. Kupcho an extensionist expert from Cook College who came to Panama to become acquainted and collaborate with:

- The development of Extension Strategies in Agriculture including Livestock.

- Interrelations between Research and Extension particularly in reference to Generation, Technology Transfer and Technical Assistance.

The visit of Dr. Kupcho was centrally coordinated by Dr. Rafael Castrellon, Deputy General Director of IDIAP and Carlos A. Neyra. In Chiriqui, the coordination was in charge of Ing. Omar Chavarria, Director of the Western Region of IDIAP and Dr. Pedro Argel, Rutgers TA team member. The activities scheduled in Chiriqui were highlighted by the offering of a round table entitled "Discussions about Extension, Technology Transfer and Technical Assistance". Participants included staff from IDIAP, MIDA, FAUP and other local representatives of the agricultural sector. Dr. Elizabeth de Ruiloba, a Communications Specialist of IDIAP provided technical support for the organization of the roundtable.

The trip of Dr. Kupcho also included visits to each of the regions covered by IDIAP: Eastern (Chepo); Central (Santiago, Veraguas) and Western (Chiriqui).

- Dr. J. Howard Ellison, Professor from the Horticulture Dept., Cook College, came to Panama to visit the vegetable producing areas in Boquete (Chiriqui). Dr. Ellison came as part of a project with VOCA (Volunteers in Overseas Assistance).

- Coordination of a visit by Dr. Reed Hertford, Director of IAFP, Cook College and Rutgers Manager of the ATD project. As a coordinator in Panama of the ATD project this specialist (C. Neyra) accompained Dr. Hertford in numerous meetings to present personally the Strategic Plan to representatives from various institutions, namely:

  - USAID/Panama
  - IDIAP
  - BID
  - FAUP
  - Planning Unit of MIDA
  - PRAGMA
  - World Bank
  - IICA

  In addition, Reed Hertford and Carlos Neyra held several meetings together to discuss aspects related to: a) Management of the ATD Project; b) Technical Assistance in Panama and c) Identification of new lines of Interinstitutional Cooperation between IDIAP and Rutgers University.

4. Rutgers/IDIAP Office Annex.

During this quarter we concluded negotiations for implementation of Rutgers/IDIAP Office Annex located on the 5th floor, Apt. 13/15 of the "Condominium Hilton Park" at short distance from IDIAP and USAID/Panama headquarters.

The office include space for: desk/office for the Rutgers Chief-of-Party; Administrative Assistant/Project Coordinator and a Secretary/Receptionist. Additional space is available in the reception area; a meeting room and space for file cabinets and support equipment. We will try, as possible, to implement the office with facilities for occassional work by any of the Rutgers Technical Assistance team members working in-country when visiting Panama City. This Office is also intended to help facilitate communications with Rutgers Administration in New Jersey as well as facilitate inter-institutional coordination.