

PROJECT EVALUATION SUMMARY (PES) - PART I

Report Symbol U-447

1. PROJECT TITLE Livestock Feed Production and Utilization			2. PROJECT NUMBER 664-0293	3. MIS... USAID/Tunis
5. KEY PROJECT IMPLEMENTATION DATES			4. EVALUATION NUMBER (Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY) 664-81-1	
A. First PRO-AG or Equivalent FY 77	B. Final Obligation Expected FY 80	C. Final Input Delivery FY 81	<input checked="" type="checkbox"/> REGULAR EVALUATION <input type="checkbox"/> SPECIAL EVALUATION 7. PERIOD COVERED BY EVALUATION From (month/yr.) 4-78 To (month/yr.) 10-80 Date of Evaluation Review 10/80	
6. ESTIMATED PROJECT FUNDING				
A. Total \$ 8,617				
B. U.S. \$ 2,497				

8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

A. List decisions and/or unresolved issues; cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SPAR, PIO, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
1. Revise four chapters of Handbook (dairy, cattle health guide, sheep)	S. Allalout Wm. Kelso R. Dunlap	9/1/81
2. Strengthen Handbook sections on seeding of perennial forages.	S. Chouki H. Galt	2/1/81
3. Assist and encourage seed growers to form a seed growers association.	J. Ammar I. Fobair	9/1/81
4. Organize a national range management program directed toward the improvement of natural grazing lands.	J. Ammar H. Dickherber	4/1/81
5. Retain central team approach to support livestock extension agents after project terminates in 1981. It is recommended that this be accomplished by the creation of an office of technical services under the PDG of OEP.	H. Najjar J. Ammar	4/1/81
6. A formal monitoring system should be developed in order to evaluate progress of farmers who have graduated from the demonstration program.	J. Ammar W. Litwiller	9/1/81
7. Demonstrations should be held with sheep herds of 25 or less.	J. Ammar R. Dunlap	4/1/81

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS	10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT
<input type="checkbox"/> Project Paper <input type="checkbox"/> Implementation Plan e.g., CPI Network <input type="checkbox"/> Other (Specify) _____ <input type="checkbox"/> Financial Plan <input type="checkbox"/> PIO/T <input type="checkbox"/> Logical Framework <input type="checkbox"/> PIO/C <input type="checkbox"/> Other (Specify) _____ <input type="checkbox"/> Project Agreement <input type="checkbox"/> PIO/P	A. <input type="checkbox"/> Continue Project Without Change B. <input type="checkbox"/> Change Project Design and/or <input checked="" type="checkbox"/> Change Implementation Plan (see recommendations) C. <input type="checkbox"/> Discontinue Project

11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)	12. Mission/AID/W Office Director Approval
C. J. Fliginger, ADO, Project Officer W. F. Litwiller, Project Manager, USAID/PASA F. J. Kerber, Program Economist J. Ammar, Project Director, O.E.P.	Signature: <i>William F. Gelabert</i> Typed Name: William F. Gelabert, Director Date: March 10, 1981

PES 664-81-1
Project 664-293

13. Summary. The evaluation team (their report is attached) concluded that the purpose of the project: "to develop the Government's capability to reach the small livestock farmer with modern technology in forage production, feed utilization and livestock management" (Nellum Report: page 5), was being met. While their report is full of suggestions for improving the way in which things are done, they nowhere suggest that the purpose is not being met. They only suggest there are many easy improvements that could be made in the way it is being met.

In making these suggestions, the joint project evaluation team focused on many technical interventions and in many cases attempted to second guess project technicians on the activities. In doing so, the evaluation failed to give as much attention to the institutional and policy aspects of the project as desired.

In general, the project evaluation report as attached is considered to be valid. Most of the project outputs have been achieved and even exceeded ~~on~~ schedule. Most disappointing is that the institution developed, while being one of the more effective agencies of the Ministry of Agriculture, does not have the impact on the formation of policies affecting the development of the livestock, feed, seed and forage industries of Tunisia it could and should have. This stems mainly from the lack of inter-agency working relationships of regular working contacts and exchanges of information within the Ministry, as well as with other agencies and elements of the industry.

Among the team's major concerns was a possible reorganization of the Tunisian Livestock Extension system. They were concerned, that in any such reorganization, the positive elements put in place with the help of the project be retained (p. 26).

Another concern of the team was that cultural and bureaucratic factors in fact kept the number of small farmers actually reached below their proportion in the target population (p. 31). Project records clearly show that small farmers are being reached, and in fact predominate. But USAID and the Government of Tunisia have adopted a major operational recommendation to more effectively reach small farmers (PES, PART I Recommendation 7.)

Part II

PES 664-81-1
Project 664-293

This project is nearing its completion, and there are no serious problems in the way of having a satisfactory livestock and forage production extension system continue in Tunisia so long as the country and the government wish to support it.

14. Evaluation Methodology

This evaluation was delayed several times by unexpected difficulties in fielding an expert team of evaluators recruited or hired by A.I.D./W in collaboration with the USDA. Although it was decided early on that the evaluation would be preceded by a joint U.S.-Tunisian seminar on evaluation concepts, methodology, and objectives, funding constraints and non-availability of seminar leaders reduced that preparation to a half day seminar led by a development intern (with several years of professional private experience in the field) already with the U.S. mission.

The delays were such that what was designed as a mid-project evaluation, in fact occurred only eleven months prior to the FACD.

Following the initial seminar, the joint evaluation team (described in the team report, p.4.) split into smaller groups that conducted site visits, interviews, and selective reviews of project records.

The joint team report is attached, and is an integral part of this Project Evaluation. A large number of recommendations were made by the team, partly because the short period of time it had to actually consider its report left no time to winnow these. Consequently, a memorandum from William F. Litwiller, Chief of Party and principal advisor of the USDA team providing technical assistance financed by the project, briefly addressing each of their recommendations is also attached and is an integral part of the evaluation.

15. External Factors

A major shortcoming of the evaluation team was that it did not address the external factors, including agricultural policy in Tunisia, in depth. There are serious questions about some of the assumptions and their impact on the project, but these problems are not preventing it from achieving its project purpose.

PES 664-81-1
Project 664-293

16. and 17. Inputs and Outputs See the attached report.

18. Purpose See attached Report (p. 26 ff)

19. Goal/Sub Goal

As the project purpose seems well on the way to being achieved, so is the project and sector goal, increased income and productivity.

20. Beneficiaries

This project is intended to directly benefit small livestock farmers and growers of forage in Rural Tunisia. The record of cooperating farms clearly indicates that this group of farmers is being successfully reached. Permanent increases in their productivity and income are likely, but it is too early to confirm these or their permanence. Also see attached report and Comment in 1. Summary, above.

21. Unplanned Effects

This was one of the factors inadequately addressed by the evaluation team.

22. Lessons Learned

The major lesson learned about this project and similar activities from its evaluation is that problems of administrative capacity and internal responsibility (largely stemming from excessive centralisation of authority) are major constraints on the development of institutional capacity in Tunisia. The project is successful in that a continuing, improved capability to serve small livestock and forage farmers will have been put in place. But that capability will be less than it might have been had the basic administrative problems been recognized at the outset and attacked throughout the project contribution period. The PASA team was

Part II

PES 664-81-1
Project 664-293

largely estopped from dealing with these problems directly and confined to dealing with technical questions and issues through much of the project. Means were devised by which the administrative problems' adverse impacts upon project activities were kept to a minimum. But these means depended upon the continued presence and participation of USAID.

A second lesson concerns evaluation itself. Good evaluation depends upon a good evaluation team, - imaginative, broad based, and with sufficient experience and time to take a considered mature look at the project, its purpose, and its environment. This evaluation team was hurried, and spent much of its time and energy on technical questions.

24. Attachments

1. Evaluation Report of the USAID Tunisian Livestock Feed Production and Utilization Project 664-293
(A.L. Nellum and Associates: October 1980).
2. Litwiller OM of December 9, 1980.

(One copy only of Attachment 1 is being submitted herewith. Additional copies have presumably been deposited with the appropriate office or are available from the contractor.)

A.L. Nellum and Associates
1990 M. Street N.W. Suite 200
Washington D.C. 20036)

Office Memorandum

USAID/TUNISIA

TO : The Files

DATE: December 6, 1980

FROM : William F. Litwiller, Project Manager

SUBJECT : Evaluation Report of the Livestock Feed Production and Utilization Project 664-0293

REF.: Evaluation Report on the USAID/Tunisia Livestock Feed Production and Utilization Project 664-0293 dated October, 1980 by A.L. Nellum and Associates

The objective of this memorandum is to address the recommendations of the referenced report and to state GOT and PASA team reaction and action that are being taken to implement certain recommendations. Although for several reasons, including structure of the team and the short duration of the evaluation, the evaluation lacks the depth and understanding desired, it does contain many useful recommendations that are proving helpful to the GOT and PASA team.

In the attached report, the Summary of the Recommendations appears on pages 8 - 10. This memo only includes the response or comment concerning these recommendations.

Attachment: a/s

cc: F&A
PROG
C&R 2

BEST AVAILABLE COPY

RESPONSE TO RECOMMENDATIONS

Recommendation Number

- 1 Two training seminars are felt needed, and we support their continuation. However, they should encompass the total Projet Intégré subject matter, not just livestock.
- 2 Their attendance should be authorized according to their functional needs, not an open policy that will create absenteeism from their job.
- 3 The evaluation team must have overlooked the fact (see page 16) that the Economics Section scheduled 24 regional mini-seminars of one day duration during the year (held 20). The evaluation team must have also overlooked the 11 regional farm planning seminars also of one day duration that were held with agents from 18 governorats during the year. The bovine, ovine, forage and economic sections participated in these seminars.

According to agents' prior experience and current functional needs, more than two days are required for the staff in many governorats.
- 4 The chapter on Dairy Cattle production is already in the process of revision. The chapter on "Dual Purpose Cattle Production" is not being revised because the major emphasis in Projet Intégré is on milk production and this chapter is adequate to serve our future needs in this subject.
- 5 This chapter will be rewritten by the Tunisian staff and appropriate consultation with local veterinarians will be included.
- 6 The perennial forages section is in the process of being strengthened.
- 7 The evaluation team must have gained an incorrect impression of the role of Projet Intégré. In OEP, Projet Intégré is assigned the primary responsibility of conducting educational programs to increase forage production and its utilization in producing milk and meat. Secondary emphasis is placed on beef production as a complementary product from the dairy herd. Projet Intégré is not emphasizing mixed grazing systems. The FAO/SIDA project within OEP has the primary responsibility for bull fattening and beef cattle production.

An M.S. in nutrition will not address the husbandry practices needs of the project. An M.S. in animal husbandry would more nearly address the project requirements.
- 8 The evaluation team did not attend a demonstration field day and, therefore, was not aware of the bulletins, line drawings, charts, and slides that are being used by the project.

RESPONSE TO RECOMMENDATIONS (continued)

Recommendation
Number

- 9 This is a valid criticism and this phase is being strengthened.
- 10 This recommendation is being implemented.
- 11 This recommendation is being implemented.
- 12 This recommendation is being implemented.
- 13 Agreed.
- 14 Agreed.
- 15 Has already been initiated and will be extended.
- 16 Has been emphasized and will continue to be.
- 17 Seed Production is not on a two-year participation period. It is a continuous program with participating farmers.
- 18 Each section has specific functions which are full time and reach out in separate directions of Tunisia.
- 19 A valid recommendation, and is being implemented.
- 20 The development of winter pasture for dairy cows and fattening bulls has been a successful Projet Intégré demonstration and the program has been increased by 40% this year. However, for the winter forage production for green chop there is also a critical need and this phase of forage production is also being expanded.
- 21 Forage production and feeding has always been integrated with creep and lead feeding demonstrations. Normally the first action completed on a farm is to help the farmer establish or improve his forage production with assistance on livestock management a follow-up action. In the future, creep and lead feeding concentrates will not receive special emphasis because the practice is now widely adopted, especially since concentrates (due to subsidies) have been priced lower than hay.
- 22 Agreed.
- 23 A valid recommendation. Efforts are underway to accomplish this recommendation.
- 24 The report notes that 40.8% of the cultivated farms are less than 5 has. (Annex N). The latest bi-annual reports which were made available to the evaluation team supply the following information:

RESPONSE TO RECOMMENDATIONS (continued)

Recommendation
Number

24
(continued)

	<u>Size of farm with demonstration^{1/}</u>	<u>Distribution of farms by size^{2/}</u>
5 has. and less	1277 - 71.2%	40.8%
5.1 - 10 has.	253 - 14.1%	22.4%
10 - 20 has.	131 - 9.3%	19.7%
More than 20 has.	133 - 7.4%	17.1%

It should be further noted that 85.3% of the forage demonstrations were on farms of 10 has. or less while the percent of total farms of this size in Tunisia was 63.2%.

These data show that the project demonstrations are directed more intensively to the small farm size than the normal distribution of farm size in Tunisia.

^{1/} Bi-annual Report, Spring 1980, Projet Intégré, O.E.P.

^{2/} Bureau du Plan, MinAg, 1974.

25

Free inputs to larger private dairy farms has not been general practice. Annex L Table shows the average herd size in 1979 was 7 head for demonstrations and these include some larger state-owned farms which have never received free concentrate inputs from Projet Intégré. The average size flock within the integrated farm program is 18 head.

The demonstration program of Projet Intégré has been directed to flocks of 50 to 100 head. However, the sheep advisor and the Director last August agreed that changes would be made in the demonstration program. This will include a total management package and implemented in 1981 and directed to flocks of under 50 head.

It should be noted that the sheep component of the project has only been in operation for 18 months and a major change in direction is already underway.

26

It should be noted that 16% of the central staff is female and that regional staffs also include females. Advisers work with staff regardless of sex. More females are in training at agricultural schools and presently some are in training in regional offices.

27

Seminars have been used to improve these skills. In fact, the last seminar included such topics as extension methods and use of visual aids. A copy of this program was provided to the evaluation team for their review. The next seminar will also include presentations on extension methods.

RESPONSE TO RECOMMENDATIONS (continued)

Recommendation
Number

- 28 OEP and other MOA officials are aware of this problem and have made every effort to staff positions that are vacated. We do not think that promotions and assignment of greater responsibilities should be stopped in order to keep specialist in a position for a project. It must also be recognized that replacements are not always immediately available.
- 29 All parties agree to this recommendation, and plans have been drawn up for transportation. In fact this project has more vehicles per agent than any other extension activity in Tunisia. The overall allocation of vehicles to various agencies in Tunisia limits the number of vehicles that OEP can procure. There is constant pressure on the part of the USAID and OEP to assure adequate transport for agents.
- 30 Agree to this recommendation if funds are available within GOT and USAID.
- 31 OEP is a very specialized agency - Forage Production and Utilization. Other organizations in Ministry of Agriculture and Education seem more appropriate to address this need.
- 32 Efforts to establish a Seed Growers' Association have been under discussion for nearly a year. The organizational meeting was held December 4, 1980.
- 33 USAID/Tunis and the MOA are currently in the PP design stage of a range management program, in response to GOT initiatives.
- 34 Some of the central team will remain in Tunis; Dairy, Economics, Seed Production. However, the range and sheep sections will be located in the regions where closest to the rangeland and highest concentration of sheep; probably Sidi Bou Zid.
- 35 The "Direction Technique" is scheduled to be operative in early 1981 and will function as the central team with assistance from the USAID PASA advisors.
- 36 This is not a practical recommendation in view of the organizational constraints of OEP and the research institute.
- 37 OEP would welcome this addition to the central staff and would also welcome USAID technical assistance.

RESPONSE TO RECOMMENDATIONS (continued)

Recommendation
Number

- 38 This recommendation is being implemented as all concentrate inputs with cattle demonstrations will terminate on January 1, 1981. It should be noted that this trend has been underway for several years - fertilizer was eliminated in 1976. Concentrate for ovine demonstrations and free seed will continue in 1981, however, these inputs are to be phased out in 82 and 83.
- 39 Only limited quantities of molasses are available in Tunisia and are presently being used in feed mills and in liquid form on farms. It would be difficult to justify drying facilities and energy cost for this limited amount. We do not deem this to be a problem since the present quantity of molasses is being fully utilized in animal feed.
- 40 OEP is in the process of implementing this recommendation with consideration to the total farm resources and broad government support being utilized to improve the management of agricultural resources. This includes artificial insemination, dairy production records, veterinary services, forage production and farm management systems as well as marketing of farm products.

EVALUATION REPORT OF THE USAID TUNISIAN LIVESTOCK FEED PRODUCTION
AND UTILIZATION PROJECT 664-0293

Prepared for the United States Agency
for International Development

A.L. Nellum and Associates
1990 M. Street, N.W. - Suite 200
Washington, D.C. 20036

Tunis, Tunisia
October, 1980

BEST AVAILABLE COPY

TABLE OF CONTENTS

	<u>Page</u>
PREFACE	4
PART ONE: BACKGROUND	5
Introduction	5
Livestock Conditions in Tunisia	5
Policies of the Donor Agency	6
PART TWO: RECOMMENDATIONS LIST	8
Recommendations for Project Management	8
Recommendations for the Government of Tunisia	9
Recommendations for the Donor Agency	10
PART THREE: ANALYSIS OF PROJECT OPERATIONS	11
Achievements	11
Administration and Management	11
Farm Management	12
Participant Training	13
Development of the Extension System	14
In-service training program	16
Forage Seed Production	18
Forage Production	21
Livestock Production	23
Impact and Institutionalization	26
Project Purpose	26
Administration and Management	26
The Extension System	26
Forage Seed Production	29
Program Goals	30
Forage Production	30
Livestock Production	31
Income	33
The Role of Women	33

PREFACE

This is an evaluation report on the USAID-assisted Tunisia Livestock Feed Production and Utilization Project, known in Tunisia as Projet Intégré, as it enters its fifth and final year of external funding. The evaluation process was carried out by a binational team composed of the following members:

Louis Balmir, Agricultural Economist, A.L. Nellum and Associates
Houcine Boughanmi, Economist, Tunisia Ministry of Agriculture,
Office of Planning.

Ahmed Chabchoub, Livestock Specialist, Tunisia Ministry of
Agriculture, Office of International Cooperation.

Harold Cooper, Forage Agronomist, A.L. Nellum and Associates.

Mustapha Guellouz, Agricultural Economist, Tunisia Ministry of
Agriculture, Office of Livestock and Pastures.

Frank Kerber, Program Office, USAID, Tunis.

Albert Sollod, Team Leader and Livestock Specialist, A.L. Nellum
and Associates.

Menana Zitouni, Agricultural Economist, Tunisia, Ministry of
Agriculture, Office of Livestock and Pastures.

Data gathering and site visits were undertaken between October 7 and October 17, 1980; details appear in ANNEXES A and B. On October 10 an evaluation seminar was held at the Tunisia Ministry of Agriculture, Office of Livestock and Pastures. At that time the four Tunisian evaluators were added as an integral part of the evaluation team.

Analysis of the findings and the writing of this report took place in Tunis between October 18 and October 26. The final draft was prepared by the evaluation team members from A.L. Nellum and Associates, Washington, D.C., with considerable assistance from Frank Kerber, USAID/Tunis. Separate oral presentations of the results of this evaluation were made to the USAID Mission in Tunis and to the Tunisia Office of Livestock and Pastures on October 23.

The evaluation team is indebted to the following organizations and persons for their generous support and cooperation in conducting this evaluation:

The Tunisia Ministry of Agriculture, the Office of Livestock and Pastures, The United States Agency for International Development (Tunis), The administration and staff of Projet Intégré, and numerous farmers and herders in Tunisia.

The opinions expressed in this document are the responsibility of the evaluation team and do not necessarily reflect the views of the United States Agency for International Development or the Government of Tunisia.

Albert E. Sollod
Tunis, October, 1980

PART ONE: BACKGROUND

Introduction

This report presents the findings of an evaluation of a Government of Tunisia agriculture project known as Projet Intégré d'Élevage. The purpose of this project is to develop the Government's capability to reach the small livestock farmer with modern technology in forage production, feed utilization and livestock management. Funding for the project has been partly provided by the Government of Tunisia and partly by the United States Agency for International Development.

The evaluation presented herein reflects an attempt to analyze the achievements as well as institutionalization and development impact of the project. It focuses on key objectives which were defined for project management at the outset. The project itself is viewed and analyzed as an integral part of Tunisia's agricultural extension system.

The remainder of PART ONE describes the conditions and policies of the host and donor countries which led to the establishment of this project. PART TWO is a list of recommendations given separately for Project Management, the Government of Tunisia and the AID donor organization. PART THREE is an analytical narrative of project operations.

Livestock Conditions in Tunisia

From 1971 through 1975 Tunisia's livestock subsector was assisted through the Accelerated Livestock Project. Specific accomplishments were brought about by that project which, when analyzed in 1976, indicated the need for the present forage project. The major accomplishments and conditions in 1976 were the following:

1. A national office, the Office for Livestock and Pastures (Office d'Élevage et des Paturages - OEP) was established for the purpose of planning and implementing livestock and development activity, including forage and forage seed production. Regional offices were created, thereby providing the infrastructure for a national agricultural extension service.
2. There was increased receptivity on the part of the small farmer to improve technology in forage cultivation. On-the-farm forage planting demonstrations were multiplying rapidly. Over 900 new demonstrations were undertaken in 1974, and 80% of these were on farms of less than five hectares. Follow-up studies showed that almost 100% of participating farms continued to grow forage after project support was withdrawn.

(This statistic may not be important if the demonstrations involved mostly perennial species).

3. An acreage and livestock survey conducted by the project in 1974 was interpreted as showing that lack of forages was the principal constraint to livestock production in Tunisia. Concentrates and feed grains were generally unavailable or unused by the small farmers. Production could be greatly increased without them if high quality forages could be fed instead of, or in addition to, poor quality oats-vetch hay. There was not only a shortage of quality forage, but also of suitable forage seed to use in demonstrations under various climatic and soil conditions.
4. The accelerated livestock project developed a technological package for forage production and feed utilization that was designed for the small farmer. This package became the basis for project forage demonstrations and feeding demonstrations for meat and milk production.

The perceived need for greater emphasis on forages led to the development of Livestock Forage Production and Utilization Project; this project is the subject of the present evaluation. It represents the USAID-financed component of the Government of Tunisia's Projet Intégré d'Élevage. Financing was originally scheduled from 1977 through 1980, but because more than a year was needed to complete the recruitment of American technicians, the project was extended through 1981. It is now in its fifth and final year.

Policies of the Donor Agency

The United States Agency for International Development (USAID) has been the donor agency for the project. The strategy under which this agency operates is in accordance with United States legislation directives and guidelines, and is referred to as the Congressional mandate by the Agency.

The mandated policy objective which guides the development of the present project is to increase production on small farms. The project aims to do this through the provision of technical assistance which is directed toward institutionalizing an information transfer system within the Ministry of Agriculture. This information transfer system is the equivalent of an agricultural extension service. The technology transferred relates to the fields of forage production and livestock nutrition and management.

Criteria considered important by AID in selecting this project for assistance include the fact that the Government of Tunisia wanted the project and was willing to fund more than 50% of project costs. It was also considered important that the Project Purpose aims at institutionalization of the technical capability introduced during the project life.

At the Tunisia national program level, which is explicitly assumed to be aided by the present project, the following criteria were considered important: 1) Forage production is a critical constraint. 2) The target farmers are poor and resource deficient. They own up to ten hectares of non-irrigated land of Class IV (or worse), or up to two hectares on an irrigated perimeter, or less than five hectares under partial irrigation. 3) The target farmers operate more than one-half of all farms in Tunisia. 4) The project will increase production, and 5) The project will increase income.

These criteria, developed by AID and Government of Tunisia, should guide the project in its implementation and will serve as a basis for its evaluation.

PART TWO: RECOMMENDATIONS LIST

Recommendations for Project Management:

1. Two livestock seminars per year continue to be presented, with agents from northern and southern governorats participating both separately and together as the subject matter warrants. (Page 16)
2. Encourage field agents to attend other special seminars outside of OEP. (Page 16)
3. Technical specialists in the ovine and bovine sections visit each regional office once a year for two days to work on new techniques with the agents. (This is in addition to currently scheduled visits). (Page 16)
4. Central team should revise the agents' handbook chapters on livestock production. (Page 17)
5. The chapter on animal health should be completely rewritten by a veterinarian trained in preventive medicine. (Page 17)
6. Strengthen the handbook section dealing with seeding perennial forages. (Page 18)
7. An animal scientist trained at the M.Sc. level in nutrition under a mixed grazing system (sheep and cattle) should be added to the central team. (Page 15)
8. Prepare information sheets, posters and handouts using simple line drawings, charts and photographs of accomplishments for use with the field days. (Page 16)
9. Strengthen the in-service training program dealing with crop management for optimum, prolonged production after stand establishment. (Page 18)
10. Ecotypes of Hyparrhenia hirta be collected from the northern, central and southern regions and from sandy soils, stony hills and clay soils. (Page 20)
11. Seed of four other species should be requested for trial: Eragrostis curvula, Eragrostis trichodes, Boutelouva curtipendula, and Chloris gayana. (Page 20)
12. Production of seed of forage species receive continuing emphasis, with added emphasis on irrigated perennials. (Page 20)
13. A capable individual with a B.Sc. in Agronomy be selected to complete an M.Sc. program in the U.S. with emphasis on seed production, harvesting, processing, marketing and using forage species. (Page 30)

14. Initiate demonstrations on established fields of perennial species, particularly lucerne. (Page 20)
15. Demonstrations or trials be initiated to learn how many forage cuttings of lucerne can be made before taking a seed crop. (Page 20)
16. Only clean, weedfree seed be used to establish forages. (Page 21)
17. A systematic follow-up procedure be developed for farmers having stands of perennial species to assist them with management after the two-year participation period. (Page 21)
18. Consolidate the irrigated and dryland forage sections of the central team into one section. (Page 22)
19. Include perennial grass and legume forage production as well as production of annual forages in the existing irrigated areas near Béja and Jendouba. (Page 22)
20. Continue and increase the number of winter pasture demonstrations. (Page 24)
21. Integrate forage feeding into the cattle creep and lead feeding demonstrations. (Page 24)
22. Develop a formal monitoring system to follow the graduate farmer for two years after the conclusion of his demonstration. (Page 29)
23. Institutional support be given to estimate seed requirements within Tunisia two to five years in advance. (Page 30)
24. Include more small farmers (as defined in the Project Paper) in the forage demonstrations. (Page 31)
25. Demonstrations be held with herders owning 25 or fewer sheep and be followed up to determine if they have been helped. Discontinue demonstrations (free inputs) with larger private dairy farms. (Page 32)
26. Chefs d'Agence make a greater effort to utilize their female staff in actual extension work. (Page 34)
27. The in-service training program should include training in modern extension methods, i.e., communications, how to organize and work with farmer groups, use of visual aids, etc. (Page 18)

Recommendations for the Government of Tunisia:

28. No other reassignments out of the central team without provision for their replacement with someone of similar education and experience. (Page 14)

29. Additional vehicles should be supplied at regional posts. Consideration should be given to the use of mibilettes or on/off road trail bikes. (Page 15)
30. Sponsor attendance at one international meeting per year for each technical specialist on the central team. (Page 15)
31. OEP should begin working with both primary and secondary school educators to develop a program to foster appreciation of agriculture. (Page 16)
32. Encourage local seed growers to organize themselves into Seed Grower Associations. (Page 20)
33. When circumstances permit, a national range management program be organized and directed toward the improvement of the natural grazing lands. (Page 23)
34. The central team should be retained in OEP headquarters in Tunis after USAID/PASA participation in Projet Intégré has ended. (Page 26)
35. Following the withdrawal of the USAID/PASA specialist advisors, an Office of Technical Services should be permanently established under a Directeur Adjoint with line management responsibilities. (Page 26)
36. Provide an additional economist to the central team staff assigned principally to Tunisia's agricultural research institute but spending about 70% of his/her time with the central team. (Page 29)
37. An agricultural marketing expert from within the Ministry of Agriculture or other Government of Tunisia ministry be assigned to the central team, at least on a part-time basis. (Page 29)
38. Project should move away as quickly as possible from providing free inputs to the demonstrations. (Page 33)

Recommendations for the Donor Agency:

39. Explore possibility of drying and bagging molasses, possibly with the inclusion of urea before drying. (Page 24)
40. If new livestock activities are carried out by the project staff after the end of fiscal year 1981 they should be done using an integrated approach (i.e. that used on the so-called "Integrated Farms" under Projet Intégré). (Page 25)

PART THREE: ANALYSIS OF PROJECT OPERATIONS

Achievements

Administration and Management

The Office of Livestock and Pastures (OEP) is a semi-autonomous agency of the Ministry of Agriculture responsible for the planning and implementation of livestock development projects in Tunisia. It is administered by a President Directeur General who reports directly to the Minister of Agriculture.

The "Projet Intégré d'Elevage" (Integrated Livestock Project), ordinarily called "Projet Intégré", is one of the OEP projects. The others are:

- Contrôl de Performance (controlled performance)
- Insemination artificielle (artificial insemination)
- Saillie Naturelle. (natural service)
- Projet Bélier (ram project)
- Projet 501 and 502 (bull and heifer lending)
- Apiculture (bee-keeping)

"Projet Intégré" has a central office located in the OEP building in Tunis. Farm-level implementation is carried out by 19 regional OEP offices.

The Tunis central office comprises six (6) Technical Sections and one Administrative Section. They are:

- Section Economie et Etudes (Economic and Studies)
- Section Fourrage en Irrigué (Irrigated Forage)
- Section Fourrage en sec (Dry Forage)
- Section Production Laitière (Milk Production)
- Section Production de Semences Fourragères (Forage Seed Production)
- Section Ovine (Sheep)
- Section Administrative (Administration)

Each of the Tunisian central team project technicians works with one USAID/PASA specialist advisor. The Tunis central team (both Tunisians and Americans) works directly under the technical and administrative supervision of OEP's Director General. The PASA farm management economist also serves as counterpart to the OEP Director.

A Regional Agency (Agence Regionale) represents OEP in each of the 19 Governorats. The Head of the Agency (Chef d'Agence) is responsible for the technical and administrative implementation of Projet Intégré projects in the Governorat. He coordinates and supervises the activities of the technical agents assigned to the regional office which he administers.

Farm Management

The Accelerated Livestock Project, which operated from 1971 to 1975, had developed part of the infrastructure and had identified some of the institutional resources which could be utilized by the new Livestock Feed Production and Utilization Project. However, few data were gathered and classified which would facilitate evaluation of the former project for the four years of its operation.

OEP Direction suggested the selection of a few farmers to constitute a "Ferme pilote" group to undertake integrated activities, from planning to production and marketing, to include cost of forage production, harvesting, cattle and sheep management, cost of milk production, etc. Technical assistance was to be provided to the farmer throughout all production phases.

In cooperation with the regional offices, eligible pilot farms were selected. To date, eighty-three (83) integrated farms are in operation in nineteen (19) governorats, as shown in ANNEX C.

Following the selection of pilot farms, a questionnaire was developed in cooperation with the Forage, Livestock and Economic Sections of OEP. The questionnaire addressed to the farmer was designed to assess:

- the actual production of the farm
- the farmer's inventory of productive resources: land/soil, labor (quantity and quality),
- capital to help carry out the production process (durable and non-durable items)
- production plan for the coming agricultural year.

The data collected from the questionnaire provided information utilized by the forage and livestock sections of the Central Team in developing a detailed crop and livestock production plan. This farm plan includes: projected area to be devoted to forage, total production of forage, livestock forage needs, and recommendations for the balancing of livestock forage needs with the forage to be produced on the farm.

The farm plan completed by the regional staff is discussed with the farmer. Finally the central staff follow-up with the regional staff to develop crop planting recommendations and livestock feeding plans. The purposes of the Farm Record Program are:

1. To allow the farmer to use his records to improve his farming operations.
2. To provide "Projet Intégré" with important data at the farm level that will be useful in:

- Determining planning guides that help the technical staff to do farm planning.
- Providing data on cost of production of various commodities and for the farm evaluation of "Projet Intégré" recommendations.
- Providing data for policy guidance within "Projet Intégré" and OEP as a whole.
- Providing the Economic and Studies Section with data that will increase and broaden knowledge of farm management within Tunisia.

The Farm Record Book (Livre de Comptabilité des Petites Exploitations Agricoles) is written in French and Arabic to be used by the small farmer. It collects all data necessary for a financial analysis of the farming operations: Farm receipts; Farm expenses; Labor expenses by type; Yield of crops; Milk production; Home consumption of farm products; Livestock births and deaths; starting and end inventories. The book follows the Tunisian agricultural year which starts on September 1st. It has been in operation since 1977. To date, 94 books have been initiated by the "Fermes Intégrées." For the years 1977-1980, 32 books out of 40 books initiated were completed by the participating farmers.

The Economic and Studies Section analyzed the completed books and from this data develops an efficiency rating system for production.

The technico-economic data sheet gives economic coefficients used to establish demonstration costs and farm budgets. It serves to guide the farmer on the amount of inputs required to produce a given output and how to manage these inputs for maximum production. It also helps the extension agents in evaluating the available inputs on the farm when budgeting a demonstration.

The agents are trained in the preparation of the data sheet and are closely supervised by the Economic and Studies Section which revises and modifies the data sheets as necessary. The agent is required to follow the demonstration process until the final results, which are then verified by the Economic Section.

The technico-economic data sheet allows the agents as well as the farmers to witness the concrete results of the management operations, facilitate the introduction of new extension techniques and provide a measurement of demonstration success.

Participant Training

To date, nineteen Tunisian technicians have received training in the U.S. under Projet Intégré: four for Masters degrees and fifteen for short-term training. Two more are currently pursuing an M.Sc. in Agronomy in the U.S. As discussed later in the Seed Production Impact section of this

report, one technician is recommended to receive specialized training in seed production, harvesting, processing, marketing and using forage species.

Of the four Tunisians who have received the M.Sc. degree and returned to the OEP, two have been taken out of the central team. The subject matter specialists are not adequately represented on the Tunisian central team as it is now constituted. For this reason, it is hoped that no other reassignments out of the central team take place in the future.

The participant training program is as follows:

Graduate degree (M.Sc.):

Animal Science (dairy)	2
Agronomy	2
Total	<u>4</u>

Currently in the U.S.:

Agronomy	2
----------	---

Short-term training in the U.S.:

Seed production	1
Artificial insemination	2
Observation of forage and dairy	2
Project analysis	2
Observations	5
Agricultural policy	1
Agricultural extension	1
Range management	1
Total	<u>15</u>

Development of the Extension System

The original Project Proposal called for the training and regional placement of 100 extension agents in thirteen governorats. Reorganization of the Office of Livestock and Pastures regional offices has resulted in expansion to nineteen governorats throughout the country. To date, there are a total of sixty-five extension agents, of which fifty-eight are assigned to the nineteen regional offices which are participating in Projet Intégré. Of these fifty-eight, thirty-five (60%) are livestock technicians and the remainder are forage technicians.

Although the project objective of 100 agents has not been met, the evaluation team believes that the regional and sub-regional offices are

adequately staffed. Given the limitations in equipment, supplies, and vehicles, increasing the number of technical personnel would not increase the amount of extension work which could be carried out.

The evaluation team observed that in many cases agents could not go out because a vehicle was not available. The Government of Tunisia should supply additional vehicles as needed at regional posts so as not to allow extension agents to remain idle. Consideration should be given to the use of mobilettes or on/off road trail bikes where cost is a consideration. This would be especially applicable in the north where distances are not too great. The evaluation team has observed the effective use of this type of vehicle on much more difficult terrain than that found in Tunisia.

There are two subject matter specialists assigned to livestock sections at the central office in Tunis. One is a dairy specialist who received an M.Sc. degree in the United States. This person is competent and aggressive in his field of specialization, and he should continue to be utilized in providing technical direction.

The other technical specialist works in the field of sheep production. He does not have a university degree and is being transferred to a regional headquarters. This will leave a technical gap at the central level which the project should attempt to fill before the end of fiscal year 1981. However, if a participant is sent for training he should study both sheep and beef production. This is easily arranged at the undergraduate level and at the M.Sc. level could be accomplished, for example, by studying nutrition under a mixed grazing system.

All central staff should be given as much opportunity as possible to keep technically up-to-date through non-formal means. Attendance at international meetings is one method to achieve this objective, and it is recommended that the Government of Tunisia sponsor attendance at one meeting per year for each technical specialist. The specialists should actively participate in meetings which they attend.

Field days on integrated farms and on other successful farms are used to help provide information to both the technicians and to the farmers (see ANNEX D). Television documentaries of successful farms, color slide presentations, and radio and newspapers are used.

The local technicians seem quite adept at gaining the cooperation of more than enough farmers to fully occupy the technical time available.

At present three counterpart specialists are receiving training and field experience in forage work at the national level and twenty-six

technicians are working in forages at nineteen field locations. While the number of trained personnel appears nearly adequate at the moment, a continuing extension and training effort will be required to assure a flow of trained personnel to fill the need for technicians as the program expands and personnel changes are made.

There are a number of forms which have been prepared and distributed to field locations to gather, record and analyze production data on input and yields. The forms seem to meet most expected needs for these data at this time.

It is advisable to begin preparing information sheets, posters and handouts using simple line drawings, charts, talks and photographs of accomplishments for use with field days or other farmer meetings. It is also suggested that OEP begin working with both primary and secondary school educators to develop a program to foster appreciation of agriculture among school children, the future leaders of the country.

In-Service Training Program

The in-service methods developed by Projet Intégré for the continuing education of livestock extension agents consist of seminars, scheduled and unscheduled contact with livestock professional personnel from Tunis, field days, and a technical reference manual (handbook) to guide agents in their field work.

From 1977 to 1979 only one seminar was presented per year to livestock agents, but beginning in 1980 two seminars per year will be given. The evaluation did not coincide with the presentation of a seminar but, in reviewing the format and schedule, the evaluation team found the idea to be sound. It is recommended that two livestock seminars per year continue to be presented, with agents from northern and southern governorats participating both separately and together as the subject matter warrants.

The evaluation team is aware that field agents have been participating in other special seminars from time to time, and the team believes that these activities, which have involved institutions outside of the Office of Livestock and Pastures, should continue to be encouraged.

There are currently no programmed visits of the central staff to regional centers for the purpose of training the appropriate field agents in livestock husbandry techniques. The agents would benefit from the continuing education experience they could receive if the technical specialists in the ovine and bovine sections in Tunis visited each regional office once a year for two days in order to work on new techniques with the agents.

These visits, which would have an educational purpose, would be in addition to trips made for purposes of carrying out field programs.

Four chapters of the agents' handbook have been prepared on live-stock subjects: dairy cattle production, dual purpose cattle production, cattle health guide, and sheep production. Although these chapters provide much useful information for the field agent, the general quality is much less than that found in the chapters on agronomic subjects. The evaluation team recommends that these chapters be rewritten with the following guidelines in mind:

1. Greater emphasis should be placed on principles of animal husbandry, keeping in mind that most field agents will not be exposed to principles through further formal education.
2. Include more information on beef production, and development of the beef herd, in the chapter on dual purpose cattle.
3. Rewrite the chapter on sheep production, paying more attention to both principles and details (e.g., What is the point of the discussion on flushing on page 4? On page 9, vaccination against enterotoxemia is recommended once per year for the flock, whereas on page 17 twice per year vaccination is recommended. In fact, neither recommendation is optimal. How can liver flukes be controlled as suggested at the bottom of page 11?)
4. The cattle health guide is much too brief; it lacks considerable information on principles and is misleading and inaccurate (e.g., the guide fails to state that the best preventive measure for calf septicemia is adequate colostrum intake by calves. Also, it is incorrect in stating that there is no medical treatment for piroplasmiasis).

All of the veterinary medical information in the handbook is relatively weak, due to the fact that the authors have not had specific training in animal health. The evaluation team recommends that the section dealing with this material and the chapter entitled "Cattle Health Guide" be rewritten by a competent veterinarian. The emphasis should be on herd health maintenance through preventive management by the farmer himself. If a Tunisian veterinary specialist in herd health cannot be located, the project should employ a short-term consultant to carry out the rewriting.

Because the same technicians at regional and sub-regional offices are responsible for both dryland and irrigated forage production and seed production, training in each technology is frequently combined in group training seminars. Specialists from the central office cooperatively

present training in each speciality. Individual training is provided on-the-job while working with cooperating farmers.

The frequency of individual contacts on-the-job and hours spent in training through demonstration and supervision in each of the three forage components (i.e., production of seed, and of irrigated and dryland forage) should provide a very good understanding by field technicians of each.

A review of the nearly completed handbook for technicians indicates that a good job was done in regard to writing the seed production, forage establishment and range management parts. The level of the presentation will require some seminar reviews and some supervised field use to gain full understanding and acceptance by local technicians. Before final publication it would be advisable to strengthen the part dealing with the seeding of perennial forages. Differences between seeding over undisturbed, clean grain stubble and seeding of cleanly cultivated dryland should be emphasized.

There has been some training in crop management for optimum, prolonged production, but this phase of the training program could be strengthened. A large proportion of plantings have been of annual species which require less management than perennial species and most cooperators are in the program for only two years. This has contributed to a lack of urgency in training agents in stand management and harvest.

It is recommended that the in-service training program include provisions for providing training at all levels of the extension system in modern extension methods i.e., communications, how to work effectively with people, how to organize and work with farmer groups, the development and use of visual aids, techniques of conducting effective radio and television interviews and presentation, how to write effective news articles etc., in addition to technical training.

Forage Seed Production

The achievement in overall seed production has been significant if production from farms other than farms officially cooperating with Project Intégré are considered. It seems reasonable to assume that a good deal of the increased seed production nationwide is partly a result of Project Intégré operations. Both the technical staff from the central office of OEP and the regional and sub-regional offices are assisting new seed growers outside of the program to establish seed production fields. The technical staff of OEP both central and regional, cooperate closely with the several other agencies touching upon seed production i.e., INRAT, INAT, Forest Service, Grafoupast, Research Seed Laboratory, etc.

The Plant Materials Center at El Grine is operated by the Forest Service. Other agencies, including OEP, cooperate closely with planning, conducting and evaluating observational seedings and comparisons at the center. The center is the recipient of all new plant materials obtained from plant explorations and collections. The forage specialists of Project Intégré have been making major contributions in this effort. A recent exploration and collection trip resulted in the collection of 135 ecotypes of species of potential value to Tunisia. Some 80 more ecotypes were identified by Jesse McWilliams for collection from suggested locations. Project Intégré plans to help make these collections for the center.

The ecotypes will be evaluated at the center. Project Intégré personnel help with the evaluations and help extend the evaluations by placing selected materials into field trials away from the center. Eventually they will also assist with seed increase plantings of selected materials and the moving of better selections toward certification by the Seed Laboratory for commercial production.

There are 48 hectares currently being used to produce seed of four species at El Grine for field plantings. (ANNEX I). In addition, there are more than 100 species or strains in evaluation plantings at the center. There are four other centers in Tunisia where seeds are being evaluated for field plantings. They are located at El Grine, Sbibia, Saïday (Tunis), and at Le Kef.

The summaries of seed used by species since 1977, estimates of seed needs for 1980-81, record of seed importations since 1977 and record of exportations since 1977 appear in ANNEXES F, G, and H. Seed production of some annual forage species has increased to the point where it has been possible to export seed of vetch, bersim, ryegrass and lucerne (ANNEX F).

Efforts by the Project Intégré technical staff have resulted in plans by specific growers to begin producing seed on 575.95 more hectares beginning in 1980. Many of the planned seedings have already been made this year (ANNEX I).

The production of seed from annual forage species has gone very well. However, except for lucerne, the production of seed from perennial species is still in its infancy. The procedures and techniques of producing seed from perennial species are being learned and demonstrated with some success under irrigation e.g., Festuca and Phalaris Spp. A strong, continuing effort is needed for the production of these species.

There is a great need for seed of adapted perennial forage species to permanently re-seed marginal croplands and badly deteriorated rangelands.

The use of the seed for this purpose may be slow in developing. To be successful it will first be necessary to demonstrate to the land users and livestock producers not only that the perennial species can be established but the benefits that can be derived from doing so. The long-term need for planting and properly managing these species is considerable, both from a land-use viewpoint and from the viewpoint of increased livestock production.

It is recommended that ecotypes of HYPARRHENIA HIRTA be collected from the northern, central and southern regions and from sandy soils, stony hills and clay soils and be added to the materials to be tested at El Grine. This species has a wide ecological amplitude with considerable value for permanently re-seeding marginal lands. It may also have value for forage production under limited irrigation, if ecotypes are selected for that purpose. Seed of four other species should also be requested for trial. They are ERAGROSTIS CURVULA, ERAGROSTIS TRICHODES, BOUTELOUVA CURTIPENDULA, and CHLORIS GAYANA. They should each be evaluated for use as both hay and pasture.

A sound program exists for seed development and certification. If the program is followed carefully Tunisian produced seed should be readily accepted on the world market as pure seed of high quality. This will be a benefit as seed production begins to exceed local demand.

It is recommended that the production of seed of forage species receive continuing emphasis. The procedure currently being followed appears to be successful but should be evaluated regularly and modified when needed. Frequent adjustments are not unusual in a developing seed industry. New techniques, new chemicals, advances in machinery, marketing procedures, improved varieties and others all contribute to the desirability of adjustments from time to time.

It is suggested that it is time to begin exploring the desirability of encouraging local seed growers to organize themselves into Seed Grower Associations. This will help them as a group to develop their own industry, provide a unit to receive specialized extension training, adjust to changing market situations and respond as a group to national policy.

It is recommended that demonstrations be initiated on established fields of perennial species, particularly lucerne, to demonstrate the proper way and timeliness of irrigation for seed production. Irrigation for seed production is often quite different from the irrigation regime for forage. Proper irrigation regimes and cultural treatment also need to receive attention for the perennial grasses.

It is recommended that demonstrations or trials be initiated to learn how many forage cuttings of lucerne can be made before taking a seed crop. It is usually possible in a climate such as exists in Tunisia, where

adequate water is available, to take two or more crops of forage, usually as hay, before taking a seed crop. This provides the farmer with an increased income, cleans annual weeds from the field, and often can be fitted into other farm operations when less time is demanded for other work.

It is recommended that only clean, weedfree seed be used to establish forages. It is also recommended that a systematic follow-up procedure be developed for farmers having stands of perennial species, particularly for seed production, to assist them with management after the two-year participation period.

Forage Production

The achievement in forage production demonstrations (as to number, distribution of trials by climatic zones and soils, number and kind of species planted, and results) has been very good in the northern and central areas of Tunisia. Project Intégré was recently broadened to include the southern area. Demonstration plantings are few there but more are planned. (See ANNEX J).

The nature of the forage demonstrations vary from small replicated plots of species alone or in mixture, to fairly large field plantings.

Some of the plantings are in the nature of applied research (~~ANNEX J~~,) such as the trials or demonstrations of comparisons between plantings of legumes using inoculated seed and ones without inoculations. The difference in amount of nodulation is impressive in the comparison studies. The result should also be favorable in both quality and quantity of forage, and be very beneficial to the following crop.

Other plantings clearly demonstrate the superiority of timely planting of bersim. The evaluation team observed a farmer who was already cutting early planted bersim (40 cm tall) while bersim planted at the usual date was just emerging. It was estimated that the farmer might realize an additional 40 tons of green-weight forage per hectare from the early planting.

Numbers of demonstrations applied are impressive. For example, 3,487 forage demonstrations averaging .55 Ha in size on 1,907 hectares were planted in 1978. For the autumn, 1979 campaign: 1,122.75 Ha were planted (ANNEX P). The project provided forage seed to the small farmer at no cost, and also provided technical assistance on establishment, harvesting and care of the crop. The number of demonstrations has increased each year (ANNEX J).

In addition, staff members provided technical assistance to 2,729 farmers producing 14,637 hectares of forage crops outside of project activities per se.

Production studies indicated an average production in green weight of bersim of 86.5 tons/Ha on irrigated demonstration farms, an increase of 35 tons above the norm. Observation indicates comparable increases in forage production on other species such as lucerne, sulla, ryegrass, sudangrass and corn on demonstration farms.

Cost of production studies indicate that these yields compare very favorably to the production of the customary crop of oats-vetch for hay i.e., TD 9.022 per ton of dry forage for bersim (11 farms) TD 16.833 per ton of sudan grass (18 farmers) as compared to TD40 to TD 100 for oats-vetch hay.*

Forage production staff members cooperate well with other Government of Tunisia agencies, touching upon establishment, production and harvesting of forage. Working relationships seem very good. Within Projet Intégré, it is recommended that the technology overlap would justify the consolidation of the irrigated and dryland forage sections into one section. This would promote greater cooperation among the central team members toward increasing forage production.

It is recommended that efforts be initiated soon to include perennial grass and legume forage production as well as production of annual forages in the existing irrigated areas near Béja and Jendouba. The production of forages in systematic crop rotations in both the old and new irrigation projects will be beneficial in several ways. Large amounts of high quality forage can be produced to help meet needs, and the roots will provide a major input to soil structure improvement in the heavy soils common to the irrigation projects.

It is often possible to produce high yields of forage seeds on these kinds of soil with proper culture and irrigation. Lucerne in solid stands or in rows, and perennial grasses in rows can normally be relied on for good seed yields with proper fertilization, irrigation, cultivation, and insect and disease control.

* LTD = \$2.50

A word of caution is needed as the production of forages continues to increase. Often when concerted efforts are made to increase forage in an area, an objective is to reduce pressure on the natural grazing rangeland. However, without proper advance planning, the reverse may happen. As forages are increased and begin to meet the needs of existing livestock, people begin immediately to increase livestock numbers, resulting in further degradation of the rangelands. There should be a constant balancing of livestock numbers with available forage that will permit sound systems of range management and improvement of the natural rangelands.

It is estimated that the natural grazing lands in northern and central Tunisia are producing less than one fourth of their potential in the way of both forage and livestock products. The depleted condition of these lands is resulting in excessive runoff and erosion. It is possible to restore a good ground cover of perennial vegetation of good forage quality through sound range management on most of Tunisia's range. It requires sound judgement and good control of both stocking rates and grazing patterns. The benefits of natural rangeland in good or excellent condition are many and well worth the effort.

It is therefore recommended that, when circumstances permit, a national range management program be organized and directed toward the improvement of the natural grazing lands. Such a program should be broad in nature and include many different practices in order to gain a proper degree of use. Good distribution of grazing, systems of deferred and rotation grazing, some re-seeding of badly deteriorated areas, control of noxious weeds and many other techniques might be applicable.

Livestock Production

Four types of demonstrations are conducted for improving cattle production techniques. These consist of: 1. Supplemental feeding of dairy replacement heifers and beef bulls (always referred to as creep feeding regardless of the feeding method), 2. Supplemental feeding of periparturient and lactating cows with concentrates (lead feeding), 3. Supplemental feeding of dairy cows with urea/molasses and 4. Winter/spring pasturing of dairy cows and beef bulls (direct pasture). (ANNEXES K & L).

Number of Cattle Demonstrations, All Regions

	<u>1977</u>	<u>1978</u>	<u>1979</u>
Creep feeding	93	52	53
Lead feeding	32	47	43
Urea/molasses	2	2	6
Direct pasture	76	82	36

The use of urea/molasses has not been widespread because of a problem in shipping the liquid molasses. This problem might be resolved if the molasses could be dried and bagged, possibly with the inclusion of urea before drying. If all principals are in agreement, a feed processing specialist could be brought in to investigate the feasibility of drying the molasses in Tunisia. This could represent a major contribution to livestock feeding.

The evaluation was conducted at the wrong time to investigate the winter pasture demonstrations. Nevertheless, it is recommended that such demonstrations continue and, if possible, should increase in numbers. These are the only cattle demonstrations which are directly related to forage, and pasturing is one of the most effective ways to alleviate the labor constraint in livestock production.

Cattle creep and lead feeding demonstrations are similar to those for sheep in that they involve the feeding of commercial concentrates. Neither addresses the original project assumption that forage production and utilization is the main animal production constraint. Nevertheless, producers are finding the concentrates to be beneficial in increasing production. Although demonstrations with concentrates will undoubtedly continue to be carried out, the project should seek ways to integrate forage feeding into these. This could be accomplished by holding cattle demonstration principally on farms involved with forage demonstrations.

The project contribution to sheep production extension service has been the demonstrations made in the field of supplemental feeding. These demonstrations involve concentrate feeding at breeding time (flushing), during late gestation (steaming), and to nursing lambs (creep feeding).

The number of demonstrations has been increasing over the duration of the project, but the total number remains low:

	<u>Number of Sheep Demonstrations, All Regions</u>		
	<u>1977</u>	<u>1978</u>	<u>1979</u>
Flushing	15	28	34
Steaming	14	25	33
Creep feeding	9	21	30

Each of the three demonstrations is usually carried out on the same farm, so that the number of farmers reached is very low. Numerically, the sheep demonstrations have not been an important part of Projet Intégré.

Since sheep demonstrations have not been tied to forage programs by the project, expansion of this activity is not warranted if the project is to retain a focus on forage utilization.

The Forage Production and Utilization Project was originally conceived as a concerted attack upon what was viewed as Tunisia's last remaining constraint to livestock production: lack of good quality forages. (The term forage is used here to mean cultivated roughage). Before the beginning of the project, animal husbandry techniques which focused on isolated management improvements were introduced through the OEP. These techniques continued to be demonstrated after the beginning of the present project. At the same time the project has put considerable effort into demonstrating supplemental feeding with processed concentrates, and the central staff regards the expanded use of concentrates in Tunisia to be a project success indicator.

The evaluation team is of the opinion that, in the case of the animal husbandry demonstrations, too much emphasis was given in the past to the above activities when the thrust of the demonstrations should have been on the proper feeding of forages which had been cultivated by the project. The project is now introducing this feeding technology through the integrated farms, but this involves only tens of farms per year. If forage feeding technology had been introduced in the livestock demonstrations, hundreds of farms could have been reached, and if the forage culture demonstrations were also exploited, thousands of farms could have participated.

The integrated farm program, although it is complex and involves relatively few farms, is a worthwhile effort as adaptive field research on farming system in Tunisia. The program could be strengthened, however, if a more integrated approach could be taken to the livestock enterprises themselves on participating farms. Project management is aware of this but is unable to address all of the following livestock production issues:

1. breeding and reproduction;
2. genetics;
3. herd management;
4. environmental control;
5. herd health and preventive medicine;
6. production economics;
7. nutrition and feeding and
8. marketing.

From much of the above discussion it is apparent that the original single constraint concept never really caught on. Rather, an integrated approach to farm development was taken, and this was underlined by the naming of the project as Projet Intégré by the OEP. The evaluation team makes no judgement on this change in emphasis, and it is too late in the course of the project to change it. However, if new livestock activities are carried out by the project staff after the end of fiscal year 1981, they should be done with an integrated approach (i.e. that used on the "Integrated Farms").

Impact and Institutionalization
Project Purpose

Administration and Management

In addressing itself to the Project Purpose (i.e. the institutionalization of an extension system for forage production and utilization within OEP), the evaluation team concluded that the central team approach has worked well to date and should be retained in OEP headquarters in Tunis after USAID/PASA participation in Projet Intégré has ended.

Discussion of reorganization plans within OEP have indicated the intention to remove the central technical personnel from line management and to delegate this authority to the Chefs d'Agence in the regional offices. The central technical personnel would then become an information service of OEP.

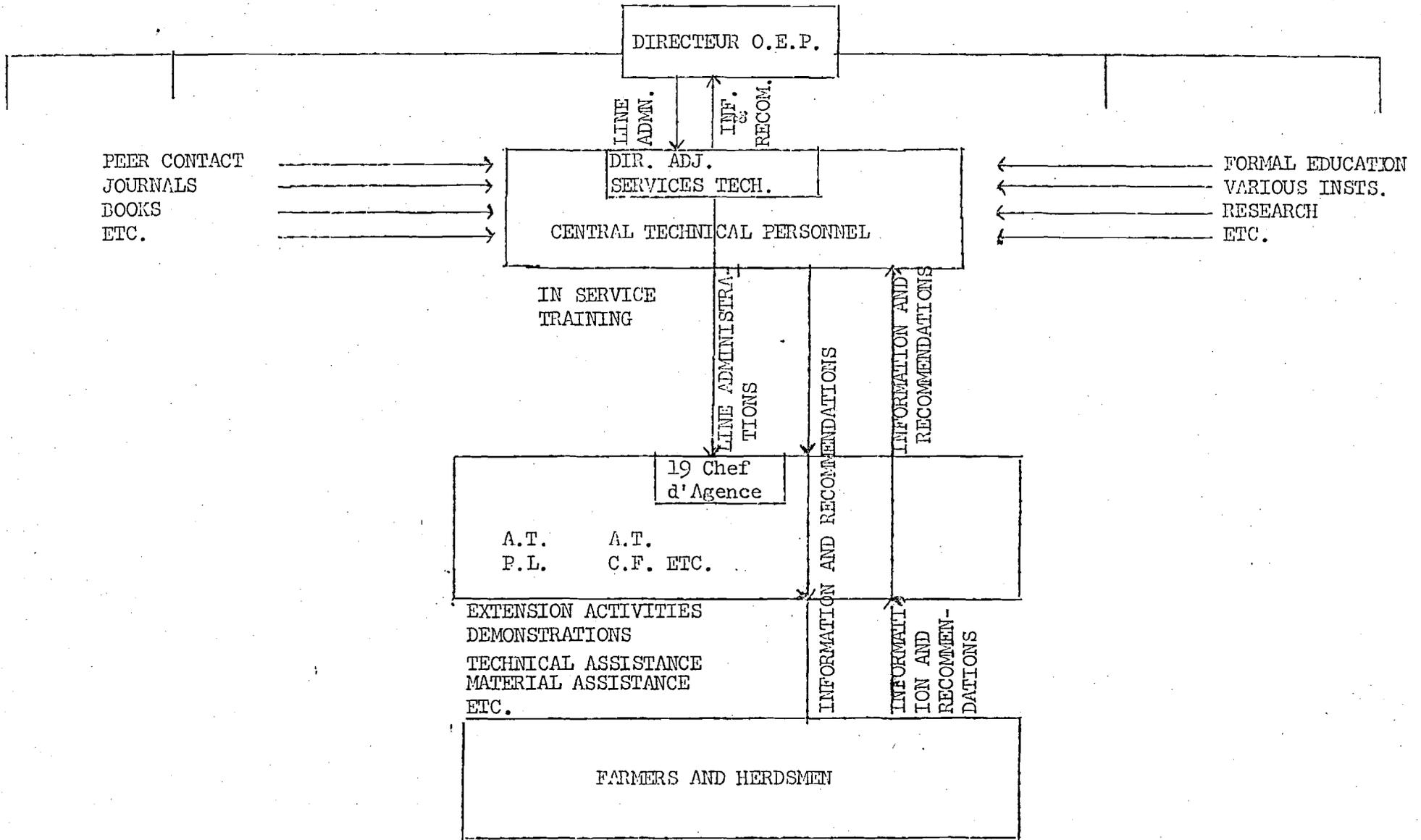
The evaluation team does not think this delegation should go to the Chefs d'Agence. The central team will be in a much better position to remain current in new agricultural and livestock techniques and to thus ensure a high quality extension program. It is therefore recommended that, following the withdrawal of the USAID/PASA specialist advisors, an Office of Technical Services be permanently established under a Directeur Adjoint (see organogram on next page). Within this office should also be included the current offices of natural service, artificial insemination, controlled performance, the ram project, bull and heifer lending and apiculture. The Directeur Adjoint would be in a line management position between the Director of OEP and the Chefs d'Agence. This proposal would best utilize the central team resource, better institutionalize the activities of Projet Intégré, and promote better coordination and cooperation among all OEP projects and the central team.

The Extension System

The impact of extension efforts regarding the technology for producing seed and forage has been considerable and favorable, particularly in the northern and central areas. More than 3,000 farmers are assisted annually to establish seed or forage production plantings. Each year about half of the cooperators complete their two-year program and are replaced by an equal or greater number.

In addition, all regions visited reported that neighboring farmers are visiting the demonstration farms and are starting to follow the advice of the demonstration farmers on their own farms. One location estimated that from 15 to 20 neighbors had begun plantings of their own after observing a demonstration farm. Therefore, the impact nationally would seem to be much greater than indicated by the official annual reports.

ORGANOGRAM OF PROPOSED OFFICE OF TECHNICAL SERVICES WITHIN OEP



Efforts in extension have primarily taken the form of demonstrations and advice, but have been reinforced by radio and television broadcasts and articles published in newspapers. The most effective extension procedures have involved visits by regional and sub-regional technicians to individual farms.

A CAUTION: The technician of the sub-regional office at Tabarka has signed up over 1000 new farmers to make forage production plantings in 1980-81. He is an effective and enthusiastic technician but there is a danger of signing up more farmers than he can service. Once farmers are led to believe that they will receive technical and material help, and prepare the land to receive it, they will become sceptical of future proposals if it is not forthcoming.

A new reporting system consisting of monthly, biannual and annual reports was initiated in year 1978. The monthly report is required from all technical agents involved in "Projet Intégré". It indicates the efforts made by each agent to initiate new techniques, and has an emphasis on particular activities according to the region and the effectiveness of his interventions. The reports serve as a data source for the biannual and annual reports.

The monthly reporting system provides the Economic Section with information on the Regional Agencies and field agents activities:

- Number of farmers contacted and farms visited.
- Number of field days held and the attendance.
- Amount of time devoted on forage, livestock, farm management, cooperation with other agencies, seminars, leave and administrative work.

A more detailed semiannual report has been elaborated consisting of narrative and statistical sections for each of the two six-month campaigns. It gives a general outlook of the activities of the agency during each campaign. This report is prepared by the Chef d'Agence who comments on the impact of the project on his region.

The semiannual reporting system provides the data to evaluate the efficiency of the technical agents in terms of:

- farmers contacted and farms visited
- hectares of forage established
- demonstrations organized and their results
- livestock situation in the program
- field days conducted.

The annual report, which is more than a summary of the two semiannual reports, contains the important elements of all monthly reports.

The new reporting system was developed by the Economic and Studies Section in cooperation with the central team technicians and the regional technical agents. Guidelines were produced for filing of the reports and follow-up by the Economic Section.

The reporting system, which supports the internal evaluation process, gives information which allows an appraisal of activities and achievements. It does not, however, allow the evaluation of either the impact, the rate of technology adoption by farmers, or the retention of the introduced technology. Continuous assessment of these factors is necessary if the extension service is to maintain flexibility in the field and have the greatest national impact.

The evaluation team believes that the central staff should develop a formal monitoring system to follow the graduate farmer for two years after the conclusion of the demonstration. Neighboring farmers should also be included in the follow-up to determine if the practices are spreading.

To carry out this task it will be necessary to provide an additional economist to the central staff, and the evaluation team recommends that this be done. In order to make best use of this specialist, he should be assigned to Tunisia's agricultural research institute, where he would work approximately 35% of the time. An additional 35% of his time would be spent at project headquarters, and the remainder would be in the field. Thus, his responsibilities would go beyond the evaluation of extension impact to cover liaison between research, project management and technical direction, and the field.

It is also recommended that an agricultural marketing expert from within the Ministry of Agriculture be assigned to the central team, at least on a part-time basis. If such a resource is not available to OEP, it is recommended that a capable Tunisian with a B.Sc. in Agriculture be sent to the U.S. to receive an M.Sc. in Agricultural Marketing and be assigned to the proposed Office of Technical Services upon completion of his/her degree.

Forage Seed Production

Records indicate that Tunisia has been both importing and exporting forage seed for many years. Indications are, however, that the amount of seed being imported is declining while the amount being exported is increasing (ANNEX F). It is difficult to attribute a specified amount of the increased production of forage seed directly to the efforts of Project Intégré, but it does appear that the extension efforts have contributed materially to national seed production. The staff members are offering

technical cooperation and assistance to other agencies such as Grafoupast, the Forest Service, and state-owned and individual seed producing farmers, in addition to working directly with Project Intégré cooperators. Plans and agreements have been reached for a significant increase of seed producing plantings on demonstration farms (over 540 Ha) during 1980-81.

The technical and cultural requirements for successful commercial production of forage seeds are quite demanding. Precise and timely actions are essential to success. Therefore, it is recommended that as soon as possible a person with a B.Sc. degree in Agronomy be selected and sent to complete a Masters degree program with emphasis on forage seed production, harvesting, processing, storage and marketing. Upon return to Tunisia he should be assigned national responsibility for the forage seed program.

Favorable economic returns from forage seed production often requires the use of specialized equipment. For this reason it may not be very realistic to expect the "small" farmers to produce seed of some forage species. But it may be possible for several small growers to coordinate their seed production so that they could economically rent equipment as required. It should be possible to develop some of the better small farmers to produce or increase special seed such as "breeder" or "registered" seed under controlled conditions (as contrasted with field production of "certified" seed). These special classes of seed increases are often small and demand premium prices. This advantage could put seed production within the economics of the small farmer, but he must be given close supervision.

It would be helpful if institutional support was given to estimate seed requirements within Tunisia two to five years in advance. A systematic approach should then be organized to help to encourage seed growers to produce the kinds of seed in the amounts needed. This would help prevent overproduction or underproduction of needed species. It should also help to assure a ready market for the seed that is produced.

Impact and Institutionalization Program Goals

Forage Production

The evaluation team has taken on a number of field trips to visit project demonstration farms (ANNEX M), and it noted that forage production has increased as a result of the demonstrations. The single-family farms in this group were mostly of five or more hectares in total size. In fact, many were large farms, some with absentee ownership and some with additional rented acreage. This caused concern among the evaluation team since the project was designed to comply with the U.S. Congressional mandate on small farmer target populations.

In the north a small farm may consist of as little as one hectare, but farm size gradually increases as precipitation decreases from 1200 mm in the north to 150 mm in the south. According to project reports, most farms assisted were small farms. In one report a small farm was defined as one consisting of ten hectares, either irrigated or non-irrigated. Other Government of Tunisia statistics (ANNEX N) show that 40.8% of cultivated farms are of less than five hectares. This group is clearly not receiving the majority of demonstrations. The evaluation team recommends that more small farms be included as defined in the 1976 Project Proposal.

The farmers contacted were pleased with the program. Of the three farmers contacted by the team after completing their two-year project period, each indicated that they were continuing to follow the Project Intégré procedures and were receiving technical assistance. This was during the year following their agreement. In addition, it was reported by the three-year participants that neighbors were visiting them and following their same procedures. This, however, was not verified by the evaluation team.

According to a summary of the 1978 annual report, the production of green forage from Project Intégré farms has averaged 35 tons/Ha green weight greater than from non-project farms.

Livestock Production

The evaluation team visited sheep demonstrations in Gafsa and Sidi Bouzid governorats, and observed that the project has guidelines as to the minimum number of ewes a shepherd must own in order to participate. In Gafsa it is fifty and in Sidi Bouzid it is 100. Since 75% of Tunisian shepherds are said to own 50 or less total sheep¹ (lambs, rams and ewes), it is apparent that the smallest herds are not targeted by the project for demonstrations.

The reason given by the project administration for the selection of larger farms and herds is that the project seeks to put on successful, quality demonstrations. It is thought that demonstrations with small farmers are more likely to fail, and that failure would significantly hinder spread of the practices (the "multiplier effect"). The evaluation team does not accept this reasoning, as it has been repeatedly shown elsewhere that for demonstrations to be most effective they should be done with peers. The small farmer may admire the results obtained on large farms but will reject the technology as unsuited to his small, tenuous operation. This is especially true if the example is a wealthy leader (such as one which the team observed) who appears to have little to lose should the technological innovations fail. Furthermore, if the technology cannot be successfully adopted by the small farmer under supervised

¹source: OEP internal memorandum, October 1979.

conditions, it certainly will not be successfully adopted under unsupervised conditions, and is therefore inappropriate to this class of farmer.

However, after conducting interviews and holding meetings, the evaluation team is of the opinion that the officially given reason for not stressing small farmer/herder demonstrations is not the operative reason. There appears to be a widespread belief, not supported by economic analysis, that Tunisia's small farmers and herders are not operating economically viable enterprises, and that helping them is a waste of time and money. This opinion is widespread within the project management, and the evaluation team found little evidence that it would change. The attitude behind this opinion is well expressed by the following comment made by a member of the central project staff: "A aider un eleveur qui a 15 ou 20 tête n'est pas la vulgarization, c'est la charité"* The evaluation team concludes that the management of Projet Intégré does not believe that the small farmer mandate is appropriate for Tunisia. However, it is recommended that demonstrations be held with herders owning 25 or fewer sheep and that these be followed-up to determine if they have been helped.

The situation regarding dairymen who participate in the demonstrations is not the same; the evaluation team found that they could participate in demonstrations regardless of how many cows they owned. However, demonstrations (free inputs) on large private dairy farms should be discontinued or kept to the minimum number needed for educational purposes.

The evaluation team found that farmers who cooperate with the project are appreciative of the demonstrations, but the team could not verify whether farmers have been continuing the practices after withdrawal of material support. Nor could it be determined whether the practices were spreading from the demonstration locus as a "multiplier effect". Repeated assurances by the project staff that these events were taking place were difficult to assess since they were views given by agents who wished their work to be successful.

From the technical viewpoint most of the project demonstrations are sound. The project staff is aware of the few questionable practices which had been introduced earlier by the project, and these practices are being phased out. Preliminary research was done by the project to test the benefits of the feeding practices which are advocated; the obtained results are convincing.

Even though benefits will result from adopting the new technology, it is not clear whether the farmers will perceive the technology as worthwhile after material support is withdrawn. The farmers may believe that

*"Helping a herd with 15 to 20 head is not extension work; it's charity."

it is not worthwhile when they have to buy their own feed, seed, fertilizer etc. Fortunately, the project staff is aware of this possibility and has told the evaluation team that materials for demonstrations will not be given free in the future. The evaluation teams supports this change as soon as possible.

Income

The evaluation team has determined that the technology being transferred through the extension system will indeed result in increased production. Through the formal data collection system (the Fiches Techno-Economic) it is known that the vast majority of participating farmers experience an increase in net income in that portion of their farming activities touched by Projet Intégré.

In interviews conducted by the evaluation team with participating farmers, no one indicated that production efficiency had declined or that labor constraints had risen due to the introduction of the new technology. In fact, several mentioned that before joining the project, farm activities had been a full-time job and that now they are free to pursue other work in addition to their farm.

There is no doubt in the minds of the evaluation team that small farmer income will increase if the technology is used correctly. The key uncertainties to be monitored during the remaining months of the project are: 1) whether the technology is correctly adopted by farmers outside of the demonstrations; and 2) whether the participating farmer will continue to recognize the benefits of using the new technology when the inputs are no longer provided free of charge.

These two project assumptions are critical to the achievement of program-level objectives.

The Role of Women

The evaluation team found it difficult to evaluate the project's impact on women due to the fact that project records regarding demonstration participants and attendance at field days are not broken down by sex. Given Tunisia's predominant Muslim culture, it is suspected that few women have been involved. The team visited one livestock demonstration managed by a widow. Women shepherds were frequently observed throughout the countryside, especially in the north. However, the project has not targeted the female population for participation. Wives of male participants obviously benefit indirectly from improved farm and livestock practices. It would be interesting and helpful to have statistics on the number of women farmers currently scheduled to participate in the project during this last year and on the number of women

attending the field days. It is recommended that such data be kept to assist in the final evaluation of the project next year.

As far as the role of women in the implementation of the project, it is estimated that about 10 of the approximately 100 Tunisians involved in the project (central and regional staffs) are women. Only one of the central team members is a woman (Economic and Studies Section). Given the traditional role of women in Tunisia as well as the nature of the work (agriculture and livestock), this would appear to be a good representation. However, the evaluation team was told that almost all of the women working in the regional offices choose to work in the office itself doing clerical jobs rather than in the field. Since they have undergraduate degrees in agriculture, it is recommended that the Chefs d'Agence make a greater effort to utilize these women in the actual extension work.

ANNEX A

FIELD TRIPS UNDERTAKEN

<u>Date</u>	<u>Locations</u>	<u>Participating Persons</u>
11 October	Kairouan, El Grine	*Louis Balmir, *Ahmed Chabchoub, *H. Cooper, J.W. Fobair, *Frank Kerber, Ahmed B.Salah, *Albert Sollod, *Menana Zitouni.
13-14 October	Sidi Bouzid, Gafsa	*Ahmed Chabchoub, *H. Cooper, Ralph Dunlap, H.D. Galt, Mohamed Haddad, *Frank Kerber, Chouki Salah, *Albert Sollod.
14 October	Tunis governorat Bizerte/Mateur	*Louis Balmir, *Mustapha Guellouz, *Menana Zitouni.
16 October	Jendouba	*H.Cooper, Akremi M.H. Echmi, W. Graves, *Frank Kerber.
16 October	Tunis governorat Zaghavon	Salah Allalout, Habib Bejaoui, *Houcine Boughanmi, Bill Kelso, *Albert Sollod.
17 October	Béjà	Salah Allalout, *Houcine Boughanmi, *H. Cooper, H.D. Galt, Bill Kelso, *Frank Kerber, *Albert Sollod.

*Evaluation team members

ANNEX B

PERSONS CONSULTED AND INTERVIEWED BY THE EVALUATION TEAM

Matmati Abdelkader	Chef d'Agence, O.E.P. Kairouan
Abdessalah Abdeljellil	Adjoint Technique, O.E.P. Sidi Bouzid
M. Abdullah	Farm Labor Supervisor, El Karma
Mounir El Abed	Farmer, El Karma
Omri Lazhar Ben Ali	Farmer, Regab
Salah Allalout	Dairy Specialist, Project headquarters
Hassama Ben Amar	Farmer, Enathour location
Hassen Ben Ameer	Adjoint Technique, O.E.P. Béjà
Jabeur Ammar	Project director, Project headquarters
Ahmed B. Ammar	Chef d'agence, O.E.P. Tunis
Abdellaziz Arabi	Ingenièrre Adjoint, O.E.P. Béjà
Tahar Ben Arif	Chef d'agence, O.E.P. Jendouba
Edmund L. Auchter	Acting Mission Director, USAID/Tunis
Moktar Baccar	Chef d'agence, O.E.P. Sidi Bouzid
Salah Barhoumi	Adjoint technique, Gafsa
Belgacem Ben Bechir	Farmer, Zahartmedian location
Habib Bejoui	Adjoint Technique, O.E.P. Tunis
Belhi Belgacem	Adjoint Technique, O.E.P. Tabarka
Ali Bouklikhil	Farmer, Hala
Ali Boukriss	Farmer, Béjà
M. Bouzidi	Farm Manager, O.E.P. Bordjtoumi
Bouchala Brahim	Chef d'agence, O.E.P. Mateur
Jeff Brown	Peace Corps, O.E.P. Béjà
Salah Chiab	Adjoint Technique, O.E.P. Kairouan
Ralph Dunlap	Sheep Production Specialist, USAID/PASA
Akreml Echmi	Agronomist, Project headquarters, Tunis
J.W. Fobair	Seed Production Specialist, USAID/PASA
C. John Fliginger	Agriculture Development Officer, USAID/ Tunis
Mohamed Gabri	Farmer, Malmassy
H.D. Galt	Agronomist, USAID/PASA
Amar Gatous	Farmer, El Guetar
William F. Gelabert	Mission Director, USAID/Tunis
M. Ghazlil	Farmer, Tunis governorat
W. L. Graves	Agronomist, USAID/PASA
Bechir Guellali	Chef d'agence, O.E.P. Béjà
Mohamed Haddad	Sheep Productionist, Project headquarters
Mohamed Hafsi	Farmer, Jendouba
B. Halima	Farmer, Tunis governorat
Hammouda Ben Halima	Farmer, Habibia location
Djallouli Kamel	Farmer, M'd hilla
Abdul Kareem	Seed Production Manager, Forrestry Service
Bill F. Kelso	Dairy Specialist, USAID/PASA

MISSING PAGE
NO. 37

ANNEX C

INTEGRATED FARMS, 1977-1981

<u>YEARS</u>	<u>NUMBER OF FARMS</u>	<u>SIZE (Ha)</u>	<u>LOCATION</u>
1977/78		8	Tunis
		16	"
		3,5	"
1978/79	10	7	Tunis
		16	"
		7,5	"
		3,5	"
		5	Nabeul
		6	Bizerte
		3	"
		8	"
		60	Beja
		3,5	Jendouba
1979/80	16	7	Tunis
		16	"
		6	"
		6	"
		5	Nabeul
		2	"
		3,5	"
		60	Beja
		85	Beja
		6	Bizerte
		3	"
		22	"
		2	"
		70	Kef
		105	Siliana
		3,5	Jendouba
1980/81	54	6,3	Tunis
		8	"
		7	"
		16	"
		6	"
		6	"
		6	"

MISSING PAGE

NO. 39

ANNEX D

FIELD DAYS HELD
YEARS 1978-1979-1980*

AGENCIES	Nbre de Journées d'Info.			Fermiers Presents			Techniciens Present		
	1978	1979	1980*	1978	1979	1980	1978	1979	1980*
Tunis/Zaghouan	3	3	3	98	90	52	38		46
Bizerte	-	11	6	-	222	78	-		30
Nabeul	2	4	4	52	67	45	35		35
Beja	-	6	5	-	292	88	-		26
Jendouba	1	2	1	6	26	49	4		4
Siliana	6	6	2	45	261	75	45		35
Kef	3	3	9	68	125	653	41		224
Sousse	-	-	1	-	-	60	-		15
Monastir	2	2	4	110	40	110	51		50
Mahdia	2	3	1	116	326	22	15		8
Sfax	-	1	1	-	45	17	-		5
Gabes/Med.	4	-	-	123	-	-	53		-
Kairouan	2	5	1	38	157	26	11		15
Gafsa/Sidi Bouziid	8	8	13	261	293	266	42		22
Total	37	53	51	884	1944		334		515

Source: OEP annual reports

*1980 - first 6 months of the year

MISSING PAGE
NO. 41

ANNEX F

SEED IMPORTATIONS IN TONS (SECTION FOURAGE A. Ben Salah)

<u>Species</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
Forage Corn	42.3	32.5	38.4	22.5	39.9	16.5
Sudan grass	11	13	17.2	12.5	15.5	12.5
Medicago	35	32	17.5	11	40	
Sub-clover	18.6	4.5	9.2		7.5	
Lucerne	11.1	17.6	45.5	37	16.2	
Ryegrass	5	0	7.1	6.3		1.5
Trefles	4.2	1.5		3.5	4	
Others	.5	1.2	3.5	7.3		1.5
Oats	0	15.5		2000		
Vetch	26.5		15.8	1500	18	
Total (tons)	154.2	117.8	154.2	3802.6	141.1	32.0

SEED EXPORTATIONS IN TONS

<u>Species</u>	<u>1975</u>	<u>1976</u>	<u>1977</u>	<u>1978</u>	<u>1979</u>
Oats	305	12.75	22.6	7.6	5.8
Vetch	530	7.2	15.7	12.1	13.4
Bersim	1.1	182	595	1.5	850
Ryegrass	600	1.7	2.5	3.3	1.4
Lucerne	10	-	6	15	-
Total (tons)	1,446.1	203.65	641.8	39.5	870.6

MISSING PAGE
NO. 43

ANNEX H

ESTIMATED NEED FOR SEED 1980-81 (GRAFOUPAST ANNEE 1981)

<u>Species</u>	<u>Kilograms</u>
Oats	360.000
Bersim	99.000
Fescue	20.000
Lucerne	50.000
Medicago	30.000
P. Sefrou	200.000
Ryegrass	12.500
Sulla	140.000
Sudangrass	150.000
Trifolium de Perse	25.000
Vetch	200.000

ANNEX I

PROJECT INTEGRE - POTENTIAL SEED PRODUCERS, SPRING 1980 (Seeded areas) (UPDATED - SEPT. 1980)

<u>Location/Name</u>	<u>Species</u>	<u>Hectares</u>
<u>ZAGHOUAN</u>		
Hadj, U.C.P. E.L. Jenec	Alfalfa (Gabes)	3.75
	Sulla	20.0
<u>EL FAHS</u>		
Mohamed Ben		
Thilja, Oued El Kir	Alfalfa (Moapa)	6.0
Habib Dous, El Emec	" "	7.0
<u>KAIROUAN</u>		
Naceur, Kelani, Oto, El Alem	Sudan grass (Piper)	20.0
	Alfalfa (Provence)	10.0
	Bersim	10.0
	Medicago	10.0
	Atriplex holismus	10.0
Mounir El Abed	Alfalfa (Gabes)	8.0
Chedli Sebouai	Alfalfa (Gabes)	2.5
Eleo Sbeitla	Alfalfa (Moapa)	18.0
<u>EL KRIB</u>		
U.C.P. Medien	Alfalfa (Moapa)	10.0
<u>JENDOUBA</u>		
U.C.P. Enou Noa	Alfalfa (Moapa)	5.0
<u>SILLANA</u>		
U.C.P. El Kantra	Sudan grass	13.0
U.C.P. El Anel	Alfalfa (Moapa)	7.0
Private farmer	Sudan (Piper)	5.0
<u>TUNIS</u>		
OTD Tebourba	Alfalfa (U.C. Salton)	6.0
	Ryegrass	7.0
	Bersim	10.2
Mounternaud	Medicago truncatula	28.0
Mrad Khaougi	Medicago truncatula	
<u>ZAGHOUAN</u>		
Mdn Ben Mustapha	Sulla	10.0
USP Batria-Mokhtar	Sulla	20.0
Ben Ali, Mohamed	Sulla	120.0

MISSING PAGE
NO. 46

ANNEX J

DEMONSTRATIONS HELD ON FORAGE AND TECHNICAL ASSISTANCE TO FARMERS
YEARS 1978 - 1979 - 1980*

Agencies	DEMONSTRATIONS			TECHNICAL ASSISTANCE								
	Number			Area on Demonstration			Farmers attended			Number of Ha.		
	1978	1979	1980*	1978	1979	1980*	1978	1979	1980*	1978	1979	1980*
Tunis/ Zaghouan	320	243	141	321	193	108,25	8	-	32	55	-	70,85
Nabeul	368	220	135	373	179	84,5	27	28	41	108	5277	105,5
Mateur	307	319	152	379	203	85,16	330	2751	88	600	17064	210
Beja	148	186	58	148	180	47,75	95	1244	230	-	5222	1188,5
Kef	-	123	85	150	126	64,89	192	223	261	7923	865	1549
Jendouba	204	315	138	188	228	62,35	289	725	209	760	1050	7
Siliana	130	81	43	132	107	46,35	140	175	-	2515	1980	-
Sousse	318	208	175	319	74	49,57	44	108	90	671	33	69,80
Monastir	296	208	219	279	36	47,27	68	173	246	77	166	-
Mahdia	-	215	208	215	38	44,99	392	231	-	4645	-	767
Sfax	-	203	83	277	56	17,80	339	-	14	9755	78	5,50
Gabes/ Medenine	256	613	1115	252	156	127,10	350	204	-	12075	269	-
Kairouan	241	119	152	216	75	57,61	189	110	-	1025	8925	4772,85
Gafsa/Sidi Bouزيد	237	268	364	238	83	92,81	266	617	123	2205	-	-
Kasserine	-	120	-	-	-	50,41	-	-	-	-	-	-
Total	2825	3321	3197	3487	1734	787,31	2729	6589	1393	14637	41010	97,46

SOURCE: OEP Annual Report

*1980 - first 6 months of the year

MISSING PAGE
NO. 48

ANNEX L

DEMONSTRATIONS HELD ON BOVINE PRODUCTION & TECHNICAL ASSISTANCE TO FARMS 1978-79-80*

AGENCIES	MILK PRODUCTION				BEEF PRODUCTION								TECHNICAL ASSISTANCE					
	1978		1979		1980*		1978		1979		1980*		1978		1979		1980*	
	Dem	Head	Dem	Head	Dem	Head	Dem	Head	Dem	Head	Dem	Head	Farms	Head	Farms	Head	Farms	Head
Tunis/ Zaghouan	10	76	14	31	10	51	7	12	4	59	12	121	85	4416	72	1353	-	3136
Nabeul	13	30	20	95	15	63	12	61	12	83	10	37	20	910	40	1908	-	1293
Mateur	6	21	10	20	6	37	8	100	5	36	2	17	854	6716	350	5200	-	3367
Beja	2	36	11	132	9	61	2	58	4	17	6	28	415	7805	530	54835	-	20920
Kef	4	61	8	109	9	49	5	30	2	5	6	45	85	67239	78	71690	-	9260
Jendouba	9	302	13	208	8	57	9	95	9	105	10	70	80	1249	350	3500	-	2040
Siliana	3	12	6	53	5	35	5	29	6	59	5	21	180	11398	120	2500	-	8547
Sousse	4	10	5	12	9	21	3	12	2	12	4	12	230	849	370	1685	-	804
Monastir	1	2	2	5	7	5	4	10	-	13	5	17	-	761	320	692	-	762
Mahdia	1	1	2	4	2	4	2	7	3	11	4	26	130	621	101	2019	-	1220
Sfax	5	15	5	15	18	6	8	27	6	20	6	20	130	700	130	1778	-	3125
Gabes/Medinine	5	14	-	-	4	16	3	9	3	14	4	16	108	357	26	136	-	13
Kairouan	2	8	3	13	3	7	2	4	6	14	6	16	191	4224	135	1329	-	1773
Gafsa/Sidi Bouزيد	3	7	-	-	6	19	5	19	4	17	6	19	169	2000	112	2118	-	1520
Kasserine	-	-	-	-	1	5	-	-	-	-	1	5	-	-	-	-	-	-
TOTAL	68	595	98	200	113	436	75	533	66	465	87	460	2677	109247	2734	149743	-	58380

SOURCE: OEP Annual reports.

*1980 - first 6 months of the year

ANNEX M

FARMS VISITED BY THE EVALUATION TEAM

FARM	KIND	TOTAL HA	SEED/FORAGE HA	IRRIGATION HA	OVINE	BOVINE
# 1 at EL KARMA	Multiple	150	8 seed	8 +	Yes	Yes
At Kairouan 202 farms	small farms	39.4 Ha. Seed 528 Ha-Forage in the Region	4 demonstrations with seed. Ave. .4 Ha		72 demonstrations average 2 livestock/ farm	
Sidi Bouzid	13 old plus 21 new in the program this year		Ave. .63 lucerne .49 sudangrass for forage			
# 2 at REGAB	Demonstration 3 years	160			(50) 100 total	Yes
# 3 NEKNESSI	Demonstration	80 + 150 leased			50 in demon- stration	
GAFSA	Sheep demon- stration	8 field days this year 5 field days for sheep; 3 for forage production				
# 4 M'DHILLA	Integrated	12 Ha	.6/irrig. forage	12	Yes	Yes
# 5 EL GUETAR	Demonstration	120	First year cooperator			
# 6 EL GUETAR	Demonstration	130 + 50	Three year cooperator - Still receiving Tech. help.		(50 were in program) more	atleast 4
# 7 At LALA	Integrated	100	.6 forage	6	Yes	?
# 8 BOU SALEM	Integrated	6	1.5 Ha forage 4 species	6	5	4
# 9 BOU SALEM	Integrated	6 + 1 1/2	2.6 Ha 4 species	7 1/2	Yes	Yes

MISSING PAGE
NO. 51

ANNEX K
DISTRIBUTION OF FARMS BY SIZE
IN TUNISIA
(Cultivated Land)

Size of Farm	No. of Farms	%	Area (in 1,000 ha)	%
Under 5 ha	133,000	40.8	307	6.1
5 - 10 ha	73,000	22.4	512	10.2
10 - 20 ha	64,000	19.7	888	17.7
20 - 50 ha	42,000	12.9	1,304	26.0
50 - 100 ha	8,300	2.6	562	11.2
100 - 200 ha	3,000	0.9	427	8.5
200 - 500 ha	1,500	0.5	468	9.3
Over 500 ha	600	0.2	554	11.0
Total	325,700	100.0	5,002	100.0

SOURCE: Ministry of Agriculture.

ANNEX O

BUDGET FOR PROJET INTEGRE

According to the Project Paper, total U.S. contribution to Project Intégré was projected to be U.S. \$1,608,000. As of August 30, 1980 total U.S. expenditures have come to U.S. \$1,782,000. Among the contributing factors identified, beyond inflation, are the following:

- the irrigation forage specialist was extended from two to four years.
- a sheep specialist was added through Amendment # 3 in 1979.
- the cost of training participants in the U.S. has doubled since 1976 due to AID accounting procedures.
- personnel changes in the PASA team were not anticipated in the budget.
- the PASA team was scheduled to work for a solid 48 month period without home leave.

Total Government of Tunisia (GOT) contribution to the project was projected to be \$6,120,000. GOT contribution to Projet Intégré consists of three parts: Title I, Title II and the Trust Fund. Title I funds are used for staffing expenses of Tunisian personnel in the project. Title II funds are for equipment, supplies, and vehicles used by the Tunisian staff. The Trust Fund is used to purchase locally supplied demonstration equipment, purchase and maintain vehicles for the PASA team, and for printing expenses. Of a total of 52 project vehicles, 7 are covered by the Trust Fund. The Trust Fund is administered by USAID. Total Government of Tunisia expenditures as of August 30, 1980 have come to approximately \$4,343,000.

MISSING PAGE

NO.

54

ANNEX P

SUMMARY OF AUTUMN CAMPAIGN 1979 (Rapport Annuel, Annee 1979, Office de l'elevage et des Pasturages, Project Intégré, Pg.2)

<u>Species</u>	<u>Ha Planned</u>	<u>Ha realized</u>
Lucerne	190	242.1
Bersim	295	304
T. Perse	40	32.75
Medicago	50	49.5
Fescue	19	5
Sulla	330.5	257.4
*R.G. & Medic	190	114.5
R.G. & T.S.*	25	20.75
Fescue & T.F*	23	21.25
R.G. & Bersim)		
+ Medics + Barley & Oats)	40	75.5
Total	<u>1,202.5</u>	<u>1,122.75</u>

On 1,958 farms - accomplishment was well distributed among the regions (Agence)

- *R.G. = Rye Grass
- T.S. = Trifolium subterraneum
- T.F. = Trifolium fragiferum

SUMMARY OF SPRING CAMPAIGN, 1979 of forage plantings (Rapport annuel, Annee 1979, Office de L'Elevage pasturages, Project Intégré - Page 5)

<u>Species</u>	<u>Planned Ha</u>	<u>Accomplished Ha</u>	<u>New farms</u>	<u>Old farms</u>
Lucerne	287	313.34		
Sudan grass	<u>345</u>	<u>292.09</u>		
Total	632	605.43	940	624

95.8% of goal

Total of farms 1,564

Well distributed among regions.

MISSING PAGE
NO. 56

ANNEX P CONT'D

IRRIGATION ONLY

<u>Species</u>	<u>Planned</u>	<u>Realized</u>	
Lucerne	168	156.40	
Bersim	<u>314</u>	<u>238.65</u>	
Total	482	395.05	81.96% of goal

AVERAGE YIELDS REALIZED IN TONS
PER HECTARE (Green Weight)
(Rapport annuel, Annee 1978)

<u>Species</u>	<u>Yield in tons/ha</u>
Lucerne	95
Bersim	94.5
Sudan grass	90

Headquarters staff members made 186 trips to field locations in 1978.