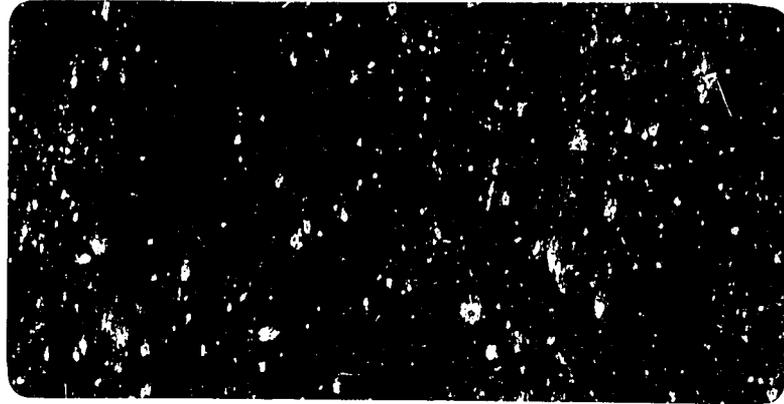


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**AGRICULTURAL DEVELOPMENT SUPPORT II  
HAITI**



**University of Arkansas,  
Fayetteville**

STUDY ON THE ADOPTION OF ADS II  
FARMING SYSTEM INNOVATIONS

Report #43 (English)

ADS II  
Agricultural Development Support Project II

STUDY ON THE ADOPTION OF ADS II FARMING SYSTEM INNOVATIONS

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# STUDY ON THE ADOPTION OF ADS II FARMING SYSTEM INNOVATIONS

## I. Introduction

The farming systems component of the Agricultural Development Support Project Number Two (ADS II) began its operations in the Les Cayes region of Haiti with a rapid reconnaissance survey of prospective intervention sites in early 1984. Since this time, the project has initiated a number of innovations in collaboration with participating households. These interventions include the testing and introduction of improved varieties of rice, sorghum, beans, and tubers, and the development of alternative management techniques with respect to animal husbandry, soil conservation practices, and the planting, harvesting and threshing of the major crops found in the region.

Many of the proposed innovations were initially tested in researcher managed trials in the fields of participating farm households. The establishment and maintenance of the trials was performed by locally hired farmers, called "moniteurs", under the supervision of the technical assistance team and Haitian agronomists attached to the project. The moniteurs, by performing much of the work for the trials, became very familiar with the improved crop varieties and alternative management techniques being tested. This, in turn, proved effective in increasing awareness and knowledge of the innovations in the community at large.

From researcher managed trials, the project rapidly progressed to the use of farmer managed trials to test the innovations under review. These were undertaken in a number of locales of differing altitudes and rainfall levels. In addition to trials, the project has been involved in on-going extension of the promising developments. Presently, much of the project's efforts are concentrated on four major sites encompassing over 600 households or some 0.5% of all rural households in the Southern Department. Three of these sites are found in the Les Cayes Plain and one in a hill-side location at 300-350 metres.

In 1987, with the end of the project less than a year away, the ADS II farming systems component has concentrated its efforts on the extension of its most promising innovations both within and outside its defined sites of intervention. Such efforts have included assistance in establishing a farmers' co-operative seed multiplication center for improved rice varieties. This work has been completed so as to ensure the largest possible number of households have the opportunity to benefit from the project's innovations.

## II. Objectives

The ADS II project has gathered a considerable amount of information on the value of its introduced technologies. This was supplied from several seasons worth of data from researcher and farmer managed trials, opinions of farmers involved in the trials, and valuable feed-back from participants in the project's field days. Using these sources, it has been concluded that a number of interventions are ready to be incorporated into a formal extension program. Until 1987, however, the ADS II project never undertook a comprehensive study on adoption rates or the reasons why farmers were or were not adopting the introduced technologies. Such information, nevertheless, is crucial in ensuring the success of a formal extension effort planned for the project's last year of operation.

To this end, a formal survey was initiated to evaluate the rates of adoption and reasons households have for adopting and for not adopting the project's innovations in its sites of intervention. This study was designed to fulfill two objectives; first, to give a better understanding of the successes and failures of the interventions under review, and second, to build upon this knowledge to develop a more effective extension program. Specifically, the study would show, among other things, the interventions which warrant the greatest effort in extension, the misconceptions, concerns and perceived benefits that farmers have to specific innovations, and their potential for adoption.

## III. Methodology

The sample for the study was randomly selected from a list of households prepared from a 1986 census of the project's four sites of intervention. In the sample procedure each household, regardless of location, had an equal chance of being selected to be interviewed (see Table 1.).

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Table 1. Households Surveyed for the ADS II Adoption of Innovations Study

| Location          | Topography | # Sample H/holds | Total # H/holds |
|-------------------|------------|------------------|-----------------|
| Charlette/LaForce | Plain      | 71               | 222             |
| Jogue/Durocher    | Plain      | 32               | 132             |
| Macieu/Boudet     | Plain      | 57               | 156             |
| Fond-des-Frères   | Mountain   | 24               | 93              |
|                   |            | ---              | ---             |
|                   |            | 184              | 603             |

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The intention was to interview 200 households, or about a third of the total population. The high sample number was considered appropriate since it was felt there would be considerable variability among households on their perceptions of the introduced technologies. Further, for certain innovations, it was thought there would only be a small proportion of households who were adoptors. Hence a smaller sample number would not give a sufficient number of responses to adequately evaluate the technologies.

Ultimately, only 185 households were surveyed since a certain number of households could not be located and interviewed in the allotted time for the field work. It is appreciated that this could lead to some bias in the results although alternative households, themselves randomly selected from the population lists, were interviewed, wherever possible, to make up the desired numbers. One of the survey questionnaires was eliminated from the analysis as it was improperly completed.

The interviews took place between April and June of 1987. The questionnaire used was written in Créole and was divided into seven major sub-sections ( see Appendix 1. ). The first section provided an overview of the respondents' awareness of the project and its major innovations. The remaining six sections were grouped under the major headings of rice, maize, sorghum, beans, livestock, and soil conservation and were asked only when relevant to the particular household being interviewed. Hence, if a household did not grow paddy rice, as was the case for all households at Fond-des-Frères, questions pertaining to introduced rice technologies were not asked of the respondents.

#### IV. Results and Discussion

The results are presented and discussed under the separate headings as they appeared in the questionnaire.

##### Overview

A majority of respondents were either aware of the ADS II project or its general activities. Some 73% of the households surveyed were aware of the project and 75% knew of one or more of its activities. The high awareness of the project and its work in its sites of intervention is not surprising given that ADS II has actively worked in some of the areas for over three years.

Most households who became aware of the project did so through contact with ADS II personnel (84%), although a significant proportion of respondents heard of the project via word of mouth (40%), as shown in Table 2. Observation of Table 2. shows that some respondents heard of the project from a number of sources. Interestingly, about one fifth of all respondents (19%) had heard of the project via the radio. This stemmed from broadcasts made by the project over a local radio station in 1985/86 concerning alternative practices for growing rice. The

fact that about fifth of households heard of the project from these broadcasts implies that the radio is a relatively effective way to reach rural households.

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**Table 2. How Households Became Aware of the ADS II Project**

| <u>Method</u>     | <u>% of Total Households</u> |
|-------------------|------------------------------|
| Radio             | 19                           |
| Word of Mouth     | 40                           |
| ADS II Technician | 84                           |
| Other             | 4                            |

-----

Under the main categories for the ADS II innovations (rice, maize, sorghum, beans, livestock and soil conservation), differing proportions are noted for the recognition rate and actual participation in the practices (see Table 3.). In terms of number of households, the sorghum and maize innovations introduced by the project had the greatest recognition representing, respectively, 69% and 67% of the total sample. The highest recognition rates as a proportion of the relevant samples are for soil conservation practices and use of a hybrid goat for inseminations, both of which were introduced exclusively at the hill-side site of Fond-des-Frères. At this site, 100% of the 24 interviewed households claimed to be aware of these two practices. Interestingly, a number of households in the ADS II sites in the plains also claimed to know of these practices.

The highest participation in any activity was for soil conservation practices at Fond-des-Frères. This is surprising since the project only began such activities at this site in the latter part of 1985. It is, therefore, a clear indication of the success the project has had in a short period of time in encouraging farmers to adopt soil conservation practices. The lowest participation rate has been with the use a hybrid goat for breeding purposes. This is because the goat only arrived at the Fond-des-Frères site in the early part of 1987 and has therefore had little opportunity to mate with many female goats.

The participation rates in the cropping innovations ranged from 11% for black beans to 21% for sorghum. It should be noted, however, that the participation rates may be biased upwards since the data may include farmers growing introduced varieties in farmer managed trials. In such trials, some farmers who would not have normally adopted the variety/innovation in question may have done so for that particular season. More relevant participation rates for the cropping practices are presented in the individual sections since they are calculated as a percentage of those households actually growing the crop. A high participation in the ADS II fostered pig husbandry program (25%) shows its success in distributing pigs to farmer associations.

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**Table 3. Awareness and Participation in ADS II Innovations**

| Innovation        | Recognition |             | Participation |             |
|-------------------|-------------|-------------|---------------|-------------|
|                   | Number      | % of sample | Number        | % of sample |
| Rice              | 66          | 64          | 14            | 14          |
| Maize             | 126         | 69          | 35            | 19          |
| Sorghum           | 124         | 67          | 38            | 21          |
| Black Bean        | 110         | 60          | 20            | 11          |
| Pig               | 118         | 64          | 46            | 25          |
| Rabbit            | 114         | 62          | 7             | 4           |
| Goat              | 32          | 100         | 1             | 4           |
| Soil conservation | 42          | 100         | 14            | 58          |
| Rice Thresher     | 25          | 24          | 10            | 10          |

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**N.B.**

1. The number of households recognizing practices in soil conservation and goat breeding were higher than the total the number of respondents found at Fond-des-Frères. The calculated percentage of households recognizing these practices is, however, calculated as exactly equal to number of households surveyed at this site.

2. The maximum number of households that could recognize and participate in the ADS II innovations for rice production and rice thresher is equal to 103, being the number of households surveyed in the sites of Charlette/LaForce and Jogue/Durocher. The two sites are the only irrigated rice growing locations of the four areas sampled.

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**Rice**

By international standards, the average yields in Haiti for paddy rice are low. This is a result of several factors including, less developed management practices, lower use of purchased inputs, water management problems, and a lack of new higher yielding varieties. To address these issues, the ADS II project worked closely with participating households to develop strategies to increase productivity and total production.

To this end, a considerable effort was given to the testing of improved rice varieties from the International Rice Research Institute (IRRI) and the International Center for Tropical Agriculture (CIAT). Recommended practices for the transplanting of rice from nursery to the paddy, planting, harvesting, and threshing of rice were also developed in collaboration with rice farmers in its defined sites of work.

An objective of the study was to identify the proportion of households using the introduced rice varieties and management practices. To better understand the adoption process and household concerns and opinions regarding the innovations, respondents were asked to give their reasons for and for not adopting the technologies.

## ADS II Varieties

103 households were surveyed in the rice growing areas of Charlette/LaForce and Jogue/Durocher. Of these, only 45 households, or 44% of the total, usually grow rice and 43 households (42%) grew rice in the past season. However, 66 households, or 64% of total households, were aware of at least one of the ADS II rice innovations. Respondents planted 28 ha., or on average 0.65 ha per farmer, the previous season. These households planted 792 kg of seed, on average 28 kg/ha, or some 18 kg/household (see Table 4). In general, the ADS II project would recommend a much higher seeding rate of 50-60 kg/ha to ensure a sufficient number of plants germinate for transplanting to the paddies. Given a 95% germination rate, a seeding rate of 30-40 kg/ha would be recommended.

Of the total number of rice farming households, only nine (20%) planted ADS II varieties the past season. This represented some 3.35 ha or about 12 % of the total area under cultivation. These farmers planted 120 kg of seed of introduced rice varieties or about 15% of the total seed planted by all farmers.

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Table 4. Quantity and Area of Rice Planted and Number of Households Growing Traditional and ADS II Rice Varieties

|                                 | All Rice | ADS II Rice |
|---------------------------------|----------|-------------|
| Total Area (ha)                 | 28.01    | 3.35        |
| Mean Area/Farmer (ha)           | 0.65     | 0.42        |
| Median Area/Farmer (ha)         | 0.32     | 0.21        |
| Total Seed Planted (kg)         | 792      | 120         |
| Mean Seed Planted/Ha (kg)       | 28       | 36          |
| Mean Seed Planted/Farmer (kg)   | 18       | 15          |
| Median Seed Planted/Farmer (kg) | 17       | 13          |
| Number of Households            | 44       | 9           |

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Observation of Table 4. shows that farmers planted the ADS II varieties in a smaller area than the traditional varieties. However, since there were only nine households actually planting the ADS II varieties it is difficult to attach significance to this result. Although adopters of the new varieties may be considered as risk takers, it would be surprising if they devoted 100% of their farm area to such varieties.

In questioning households why they did not plant ADS II varieties, the respondents were asked to choose among four non-mutually exclusive responses precoded into the questionnaire. In addition, space was available to record any volunteered responses. 81% of rice growing households did not plant ADS II varieties the past season. These results are presented in Table 5.

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Table 5. Reasons for not growing ADS II Rice Varieties

| Reason                              | % of Rice Growing Households not Planting<br>ADS II Varieties |
|-------------------------------------|---|
| 1. Unable to Find Seed              | 49  |
| 2. Insufficient Funds to Buy seed   | 56  |
| 3. Seed was not Given to Respondent | 12  |
| 4. Does Not Like Varieties          | 51  |

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Almost half of the respondents claimed they were unable to find the ADS II varieties to plant. Whether this indicates that respondents would have indeed planted the varieties if seed were available is another matter. The high figure for farmers being unable to find seed, however, does indicate a problem the project has faced in ensuring the availability of a sufficient quantity of seed for interested farmers. For this reason, among others, the project helped set up a farmers' co-operative seed multiplication center to ensure a continuing supply of seed of the introduced varieties.

As a proportion of rice-growing households, 56% claimed they were unable to plant the ADS II varieties because of insufficient funds to purchase the seeds. Traditionally, farmers retain a certain quantity of seed from their previous crop for planting the following season. To plant new varieties, therefore, necessitates purchasing seeds. However, since the price of the seed for the introduced varieties is the same as that of traditional varieties, this should not represent a problem to the household; all that is required is for them to sell the old seed to purchase the new. The fact that a significant number of households have not done this, reflects farmer reluctance to innovate and their preference for traditional seed. Nevertheless, with the halving of the price of rice in the past 18 months due to contraband rice imports, some rice farmers are no doubt facing serious financial hardship as evidenced by their response.

A third rationale for not planting the new varieties, given by some 12% of farmers, was that the seed was not given to them. Presumably, the perceived benefits of these varieties are insufficient to warrant the households obtaining the seed by their own means. Certain households may also have noted that participating households in researcher managed trials received a number of free inputs and may, therefore, expect the same treatment for trying out new seed varieties.

About one half of all respondents claimed not to like the ADS II varieties. This high proportion of households not liking the varieties is perplexing since none of these households actually grew the varieties the past season. Presumably, therefore, their opinions came from households growing the new varieties. However, this is not corroborated in the responses given by households

when asked to give specific opinions on the varieties, where all claimed to like or like very much the introduced rice. Further, 36 respondents, or 84% of households growing rice the previous season, claimed they would like to plant ADS II rice varieties the following season. It is felt, therefore, that farmers opted for this response because there was not a precoded response where the households could cite no particular reason or "Do Not Know" for not planting the ADS II varieties.

Respondents who planted the ADS II varieties, were asked to identify the specific varieties they grew. These results are presented in Table 6.

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 Table 6. ADS II Rice Varieties Planted Last Season

| Variety     | Number of Households | % of Total Rice Farmers |
|-------------|----------------------|-------------------------|
| Amina       | 4                    | 9                       |
| Ti-Rose     | 5                    | 11                      |
| CIAT 13     | 5                    | 11                      |
| CIAT 16     | 7                    | 16                      |
| Upland Rice | 2                    | 5                       |

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The most widely planted variety was CIAT 16, followed by Ti-Rose (IR-5931-113-1), an improved rice developed at IRRI, and CIAT 13 another variety from CIAT. The variety Amina (IR-10147-113-15), developed at IRRI and currently in the seed multiplication phase, was grown by four households, or 9% of the total number of households growing rice. The upland rice was planted the least, no doubt reflecting the relatively late arrival of this variety to the project. Since only nine households actually grew the ADS II varieties, or some 20% of rice growing households, then clearly some of these households grew more than one new rice variety.

All rice growing households were asked to give their viewpoint on each introduced rice variety by stating which of four precoded responses best matched their opinion. Although many of the households may not have grown the ADS II varieties, their perceptions of the new varieties were still considered to be worth knowing. The results are presented in Table 7. It should be noted, however, that in the four categories offered to households for their opinion of the varieties, some households may have interpreted the second category, "like Variety", as meaning they like the variety **less** than another. This misunderstanding may have arisen from imprecise wording in the questionnaire. The same difficulty may have occurred in respondents' opinions of new maize and sorghum varieties.

Upland rice, which is not a direct substitute for paddy rice in terms of production, was deemed the most popular variety. Its principal advantage is to provide an alternative grain crop to dryland farmers. The most preferred paddy rice was Amina, where at

least a quarter of all respondents claimed to like it very much and over half of households liked it. For households actually growing the ADS II rice varieties it was also the best liked (see Table 7.) This agrees with evidence accumulated from participating farmers in trials, and responses from farmers at field days, where Amina seemed to be the best liked paddy rice.

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 Table 7. Rice Growing Households' Opinions of ADS II Rice Varieties

| Opinion        | % of Rice Growing Households with Opinion that Answered the Question |         |         |         |        |
|----------------|--|---------|---------|---------|--------|
|                | Amina  | Ti-Rose | CIAT 13 | CIAT 16 | Upland |
| Like Very Much | 27   | 9       | 3       | 17      | 61     |
| Like           | 52   | 73      | 80      | 66      | 32     |
| Do Not Like    | 0  | 0       | 0       | 0       | 0      |
| Do Not Know    | 21   | 18      | 17      | 17      | 7      |

|                | % of Households Growing ADS II Rice Varieties Holding Opinion |         |         |         |        |
|----------------|---|---------|---------|---------|--------|
|                | Amina   | Ti-Rose | CIAT 13 | CIAT 16 | Upland |
| Like Very Much | 75  | 25      | 13      | 50      | 20     |
| Like           | 25  | 75      | 87      | 50      | 80     |
| Do Not Like    | 0   | 0       | 0       | 0       | 0      |
| Do Not Know    | 0   | 0       | 0       | 0       | 0      |

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Households also supplied reasons for liking and not liking ADS II varieties. These responses were volunteered and hence were not precoded into the questionnaire (see Table 8.). It should be noted, however, that the number of households volunteering responses on why they liked/disliked the rice varieties was less than the number that gave their opinion on whether they liked/disliked the rice.

Amina and upland rice were preferred because of their higher yields. Interestingly, although some negative reasons were recorded for CIAT 13, 16, and Ti-Rose no households claimed to dislike the varieties. A considerable proportion of rice growing households cited lower yields as a problem for the varieties Ti-Rose and CIAT 13. 10% of households claimed that Ti-Rose broke too easily in milling. For CIAT 13, 20% of the households volunteered that its stems were too short, thereby posing a problem in harvesting and increasing the losses from rats.

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 Table 8. Reasons Given by Households for Liking or Disliking  
 ADS II Rice Varieties

| Opinion           | % of Rice Growing Households with Opinion<br>that Answered the Question |         |         |         |        |
|-------------------|---|---------|---------|---------|--------|
|                   | Amina   | Ti-Rose | CIAT 13 | CIAT 16 | Upland |
| Higher Yield      | 47  | 40      | 0       | 63      | 67     |
| Lower Yield       | 0   | 50      | 60      | 37      | 0      |
| Stem Too Short    | 0   | 0       | 20      | 0       | 0      |
| Breaks in Milling | 0   | 10      | 0       | 0       | 0      |

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### Nursery

One component of the ADS II technical package introduced with the new rice varieties was a recommendation to transplant rice seedlings from their nurseries to the fields 21 days after sowing. In the survey, rice growing households were asked to choose among five precoded responses which best represented their date for transplanting their rice seedlings. The results are presented in Table 9.

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 Table 9. Days in Nursery Before Transplanting Seedlings to Fields

| Number of Days  | % of Rice Growing Households with Responses<br>that Answered the Question |
|-----------------|---|
| Less than 20    | 11  |
| 20              | 11  |
| 21-30           | 46  |
| Greater than 30 | 14  |
| Do Not Know     | 18  |

| Number of Days | % of Households Growing ADS II Varieties |
|----------------|--|
| 21 days        | 22                                       |
| 22 days        | 67                                       |
| 30 days        | 11                                       |

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Due to an oversight in the formulation of the precoded responses, it is not clear how many of all households are in fact transplanting seedlings after 21 days. Nevertheless, one can observe that over 20% of households transplant at 20 days or less and about 14% do so at more than 30 days. The remainder either do not know at what time they transplant their rice seedlings (18%) or do so between 21 and 30 days (46%). For households growing the ADS II varieties, almost 90% transplanted their seedlings after 21 or 22 days.

For those households responding to the question of how many days after planting they transplant their rice, a further question was asked concerning their reasons for using their

particular transplanting date. The respondents were asked to determine which of three precoded responses best matched their choice for a transplanting date. In addition, space was made available to record their replies should they be different from precoded responses. These results are presented in Table 9.

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 Table 10. Reason for Choice of Days to Transplant Seedlings from Nursery

| Reason                                     | % of Rice Growing Households with Response that Answered the Question |
|--|---|
| Do Not Know                                | 69  |
| Time Available on Day Chosen to Transplant | 9   |
| Advice from ADS II Technician              | 17  |
| Other                                      | 0   |

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Almost 70% of households did not know why they chose the time to transplant when they did. This is not to say, however, that farmers randomly chose when to transplant their seedlings but is probably a function of a number of factors including labor availability and the weather. Less than 20% of respondents based their decision to transplant their seedlings on advice from ADS II project personnel. This is perhaps not surprising since only 14 respondents, or 32% of the total rice growing households, actually knew of the recommended time given by ADS II for transplanting rice seedlings. About 10% of households answering the question based their transplanting decision on the time available to them.

#### Rice Thresher

In an attempt to increase labor productivity of rice farmers, the ADS II project introduced techniques for planting, harvesting and threshing rice. Traditionally, rice growing households harvested their crop by individually cutting and picking the rice panicles by hand. The grains were later removed by pressing and treading on the panicles on a hard surface. The practices introduced by the project included the harvesting of rice with a sickle and subsequent threshing of the plants using a portable thresher. Both methods saved the household a considerable amount of time.

Although the sickle method of harvesting is virtually costless, the latest portable thresher developed by the project would cost the household about \$30. In the survey, respondents were asked if they continued to harvest their rice in the same fashion as before the arrival of the ADS II project, and if they were aware of the portable thresher. Interestingly, 36 respondents, or 70% of rice growing households, claimed to still use the traditional harvesting techniques. This is despite the fact the saving in labor costs through the use of this introduced technique may be as high as \$21/ha (see ADS II Report # 42).

However, the number of respondents aware of the sickle method of harvest is unknown. Nevertheless, the sickle method of harvesting has been adopted by a number of households in rice growing areas neighbouring the project's sites of intervention.

Some 58% of respondents, or 25 households, claimed to know of the ADS II portable rice thresher. Of these, 10 households, or about 23% of rice growing households, actually had used the portable thresher (see Table 11.). However, as a proportion of respondents actually aware of the thresher, 40% of households were users.

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 Table 11. Awareness and Use of ADS II Portable Rice Thresher and Use of the Sickle Method of Harvesting Rice

| Management Practice | % of Rice Growing Households |                      |
|---------------------|------------------------------|----------------------|
|                     | Aware of Practice            | Adopters of Practice |
| Sickle Harvesting   | -                            | 30                   |
| Portable Thresher   | 58                           | 23                   |

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N.B.: The proportion of rice growing households aware of the practice of sickle harvesting is not known.

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Those households knowing about the portable thresher were asked whether they thought the thresher was worthwhile. Of these, some 24 respondents or 56% of rice growing households claimed to know why the thresher is important. Of those knowing about the thresher, 92% of respondents, or 23 households, claimed it was important because it saved time for the household. The same proportion of households also stated they would like to have their own portable thresher. However, when asked would they be prepared to pay \$30 for such a thresher, only 13 of the 23 households, or some 56% of the respondents, claimed they would pay this price. The main reasons cited preventing them from purchasing the thresher were lack of funds and the item being too expensive.

## Maize

Maize is a major crop in both the plains and mountain zones in the Southern Department of Haiti. Because of its importance, a considerable amount of research has been devoted to developing higher yielding varieties suitable to the various Haitian environments. Both Texas A and M University and Virginia Polytechnic Institute have been involved in this research in the Les Cayes area. The International Maize and Wheat Improvement Center (CIMMYT) has continued this work in developing new maize varieties and is currently in the extension phase for at least one variety, La Maquina, that outperforms traditional types of maize in a variety of conditions.

The ADS II project has introduced La Maquina into its sites of intervention as well as showing farmers how to select the best ears of corn for seed from the local variety, Chicken Corn. In addition, the project has recommended practices for plant spacing and the number of plants to leave after thinning.

#### ADS II Varieties

Of the 184 households surveyed, 131 respondents (71%) regularly planted maize, and 112 households (61%) had done so the previous season. In total area, these households planted some 70 ha. of maize in the past season, or on average, 0.63 ha./household. 881 kg of maize was planted by respondents last season (12.6 kg/ha. or some 8 kg/household). This compares to a recommended seeding rate from the ADS II project of 25-30 kg/ha. The low seeding rates may be explained by the preponderance of intercropping in the ADS II target areas.

Of those households planting maize last season, 31% claimed to use ADS II varieties. The total area planted of ADS II varieties amounted to 11.36 ha. This area equals 16% of the total land in maize and is equal to 0.39 ha./household for those 29 households planting the varieties and giving details on area planted. Some 141 kg of ADS II varieties were planted, or 12.4 kg/ha, equivalent to 4.9 kg/household (see Table 12.)

As in the case for rice, farmers on average planted the ADS II varieties on a smaller area than for their traditional varieties. This is probably a function of their risk aversity. The fact that over 30% of households are using the ADS II varieties indicates a good potential for success in an extension of these varieties outside the project's sites of intervention.

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Table 12. Quantity and Area of Maize Planted and Number of Households Growing Traditional and ADS II Maize Varieties

|                                    | All Maize | ADS II Maize |
|------------------------------------|-----------|--------------|
| Total Area (ha)                    | 69.88     | 11.36        |
| Mean Area/household (ha)           | 0.63      | 0.39         |
| Median Area/household (ha)         | 0.40      | 0.32         |
| Total Seed Planted (kg)            | 881       | 141          |
| Mean Seed Planted/ha (kg)          | 12.6      | 12.4         |
| Mean Seed Planted/household (kg)   | 7.9       | 4.9          |
| Median Seed Planted/household (kg) | 5.6       | 2.8          |
| Number of Households               | 112       | 35           |

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 N.B. The number of households claiming to plant ADS II varieties of maize was 35, but the number of households supplying information on area planted and seed used was only 29.  
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Those households who did not grow the ADS II varieties were asked to indicate which of four precoded non-mutually exclusive responses best represented their reasons for planting or not planting the introduced types of maize. The responses for the 69% of maize growers not planting the ADS II varieties are presented in Table 13.

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 Table 13. Reasons for not growing ADS II Maize Varieties

| <u>Reason</u>                       | <u>% of Maize Growing Households not Growing ADS II Varieties</u> |
|-------------------------------------|---|
| 1. Unable to Find Seed              | 43  |
| 2. Insufficient Funds to Buy Seed   | 49  |
| 3. Seed was Not Given To Respondent | 42  |
| 4. Does Not Like Varieties          | 23  |

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A significant proportion of households (43%) were unable to find the introduced seed, however, whether farmers would have planted the varieties if the seeds had been available is not known. As with ADS II rice varieties, a considerable proportion of households claimed to have had insufficient funds to purchase the introduced seeds. Interestingly, one of the "new" varieties was simply the selection of the best ears of maize for seed from the traditionally grown chicken-corn. This practice thus involved no extra cost to the farmer. It is possible, therefore, this response may reflect lack of awareness by some of the households of the work undertaken by the ADS II project.

Some 23% of respondents reported that they did not like the ADS II varieties. This response, however, is not corroborated with the household opinions on the specific varieties, where only 3% of households reported disliking the introduced maize. Also, 107 respondents, or 95% of maize growing households, expressed a desire to plant ADS II maize varieties the following season.

The project introduced two types of maize, La Maquina 7827, a variety developed by CIMMYT in the Les Cayes Plain, and selected seeds of a local variety, Chicken Corn.

Due to some resistance to the use of the new variety, La Maquina, the project also commenced a program of selecting seed from the best ears from the traditionally grown variety, Chicken Corn. Some of the problems expressed by farmers regarding La Maquina were that the ears of corn were too big and that they were more difficult to grind into corn meal than local varieties.

Of the two varieties, 28 respondents, or 25% of households growing maize, claimed to grow Chicken Corn in the past season. Some seven respondents, or 6% of maize growing households, grew La Maquina in the previous season (see Table 14.).

-----  
 Table 14. ADS II Maize Varieties Planted Previous Season

| Variety      | % of Maize Growing H/Holds | % H/Holds growing ADS II Varieties |
|--------------|----------------------------|------------------------------------|
| Chicken Corn | 24                         | 80                                 |
| La Maquina   | 6                          | 20                                 |

-----

The widespread use of Chicken Corn relative to La Maquina is probably explained by the greater efforts made by the project in popularizing the Chicken Corn. From the farmer's point of view, selected Chicken Corn is also likely to be more accepted over new varieties such as La Maquina since it is traditionally grown by households. In addition to being the most widely planted variety, selected Chicken Corn is also the most preferred by respondents (see Table 15.).

-----  
 Table 15. Maize Growing Households' Opinions of ADS II Maize Varieties

| Opinion        | % of Maize Growing Households with Opinion that Answered the Question |            |
|----------------|---|------------|
|                | Chicken Corn  | La Maquina |
| Like Very Much | 73  | 9          |
| Like           | 5   | 36         |
| Do Not Like    | 0   | 3          |
| Do not Know    | 22  | 52         |

-----

In determining the opinions of respondents regarding the varieties, all maize growing households were asked to indicate which of four precoded responses best fitted their viewpoints. In addition, households were asked to provide a reason for their opinion.

Selected Chicken Corn was liked very much by almost three quarters of the maize growing households answering the question. Of the remaining respondents, 5% liked the maize and 22% did not know of the variety. In comparison, about 10% of households claimed to like La Maquina very much, while some 36% of respondents liked it. A greater proportion of households, over 50%, were unaware of La Maquina. Proportionately, fewer households were aware of La Maquina at Fond-des-Frères than in the Les Cayes Plain. Only one household out of 23 (4%) recognized the variety at Fond-des-Frères compared to 73% of households in the project sites in the Plain. Some 3% of respondents claimed not to like La Maquina.

The reasons for the respondents preferences for the ADS II maize varieties are presented in Table 16. These responses were volunteered by households giving their opinion of the varieties and, hence, were not precoded in the questionnaire.

The main reason why households liked the selected chicken corn is that it gives a higher yield than their traditional varieties. Another reported advantage was that it matured faster. A considerable proportion of households that reported liking the variety La Maquina stated, rather incongruously, that it gave a lower yield. It would seem this is in comparison to the selected Chicken Corn rather their traditional varieties, otherwise a much greater proportion of households would have responded unfavorably in their opinion of the variety. One household, or 3% of respondents answering the question, claimed La Maquina gave problems in milling the corn into meal and one other claimed it gave too much flour in milling. Interestingly, a significant proportion of respondents (24%) stated the corn was too large. This may be a problem because the grains from a larger sized cob such as La Maquina would be harder to remove than for Chicken Corn. Hence, this task requires a greater amount of time and effort than is the case with traditional varieties.

-----  
 Table 16. Reasons Given by Households For Liking or Disliking ADS II Maize Varieties

| Opinion            | % of Maize Growing Households with Opinion that Answered the Question |            |
|--------------------|---|------------|
|                    | Chicken Corn  | La Maquina |
| Higher Yield       | 80  | 18         |
| Grows Faster       | 20  | 0          |
| Lower Yield        | 0   | 52         |
| Too much Flour     | 0   | 3          |
| Difficulty milling | 0   | 3          |
| Corn too Large     | 0   | 24         |

-----

#### Plant Spacing and Number Of Plants

In addition to introducing new varieties of maize, the project also developed recommended practices for the spacing between plants (75 X 50 cm) and the number of plants per hill. These practices were designed to increase the overall yield.

Some 75% of households claimed to continue to plant their corn in the same fashion as before the arrival of the project. In terms of plant spacing, only 30% were aware of the distance recommended by ADS II, but of these, 91% claimed to follow the project guidelines (see Table 17.).

The recommended practice of leaving just two maize plants per mound was practised by about 30% of households. The vast majority stated they usually leave three plants per hill.

-----  
 Table 17. Awareness and Adoption of ADS II Maize Planting Practices

| Practice                             | % of Maize Growing Households Answering Question |                  |
|--------------------------------------|--|------------------|
|                                      | Aware of Practice                                | Adopter Practice |
| Plant Spacing (75x50 cm)             | 30   | 28               |
| Number of Plants per hill (2 plants) | -  | 31               |

-----  
 N.B: The proportion of maize growing households aware of the practice of leaving 2 plants per mound is not known.  
 -----

### Sorghum

Sorghum is one of the major grain crops of Haiti, generally grown in drier, less favorable conditions than maize. In the Les Cayes region, during the second agricultural season, sorghum is the dominant crop in terms of area planted. It is planted at this time of year because traditional sorghum varieties are photoperiodic, requiring progressively shorter daylight periods to be able to seed.

The innovations to date for sorghum include the introduction of new and non-photoperiodic varieties from the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT), the popularization of varieties developed by other projects in Haiti, and recommended practices for plant spacing and the number of plants per hill.

### ADS II Varieties

For the 184 households surveyed, 107, or 58% of respondents, usually plant sorghum, and 81 households (44%) did so in the previous agricultural season. Of these 81 households, 72 provided data on area planted the previous season. For these respondents, the total area in production the past season was some 41 ha. or an average of 0.56 ha/household. They planted a total of 476 kg. or 5.6 kg of seed per household

38 households, or 47% of respondents, claimed to have planted ADS II varieties the previous season. Of these 38 households, 29 supplied information on area planted. For the past season, 5.7 ha. of respondents' land was planted in ADS II varieties, or some 14% of total sorghum area, equivalent to an average area 0.20 ha/household. These households used some 40 kg seeds, equivalent to 1.6 kg/household (see Table 18.).

Observation of Table 18 shows that the households planting ADS II varieties plant a much smaller area in the new varieties compared to the average area planted for all varieties. Again, this probably indicates a degree of risk aversity among the adopters of the new varieties. Of note is the fact that although the proportion of adopters to non-adopters is highest for sorghum relative to other grains, the average area planted per household is the lowest at 0.2 ha compared to 0.42 ha and 0.39 ha respectively for rice and maize.

-----  
 Table 18. Quantity and Area of Sorghum Planted and Number of Households Growing Traditional and ADS II Sorghum Varieties

|                                    | All Sorghum | ADS II Sorghum |
|------------------------------------|-------------|----------------|
| Total Area (ha)                    | 40.6        | 5.7            |
| Mean Area/household (ha)           | 0.56        | 0.20           |
| Median Area/household (ha)         | 0.49        | 0.08           |
| Total Seed Planted (kg)            | 476         | 37             |
| Mean Seed Planted/household (kg)   | 5.8         | 1.6            |
| Median Seed Planted/household (kg) | 5.6         | 1.4            |
| Number of Households               | 72          | 29             |

-----  
 N.B.

1. The number of households reporting the area of land planted for all sorghum varieties was 72, while the number of households reporting the quantity of seed planted was 82. The mean values per households for area planted and seed used are calculated using the respective number of respondents for each question.

2. The number of households reporting the area of land planted for ADS II varieties was 29, while the number of households reporting the quantity of seed planted was 23. The mean values per household for area planted and seed used are calculated using the respective number of respondents for each question.

-----  
 Reasons for households not planting the ADS II varieties are presented in Table 19. The opinions presented were supplied from the 43 households growing sorghum in the past season that did not plant the introduced varieties. Since these reasons were not mutually exclusive, many households gave more than one response to the question.

Over half the households (54%) claimed they were unable to find the ADS II varieties to plant. Some 58% of respondents stated they did not plant the varieties because the seed was not given to them. About half the number of households claimed they had insufficient funds to purchase the seed, and 35% said they did not like the varieties. The number of households not liking the ADS II varieties is, however, not corroborated with the opinions given for the individual varieties, where only 5% of all

respondents claimed to dislike one or more of the varieties. Nevertheless, the proportion of all sorghum growing households who wish to plant ADS II varieties next season was just 65% of respondents, considerably less than for other grains introduced by the project. For instance, for rice and maize respectively, some 84% and 95% of households expressed a desire to plant ADS II varieties the following season. This suggests that, at least in the project's sites of intervention, there is a greater potential for households to try new varieties of rice and maize in comparison to sorghum.

-----  
 Table 19. Reasons for not growing ADS II Sorghum Varieties

| Reason                              | % of Households Growing Sorghum and not Planting ADS II Varieties |
|-------------------------------------|---|
| 1. Unable to Find Seed              | 54  |
| 2. Insufficient Funds to Buy Seed   | 49  |
| 3. Seed was not Given to Respondent | 58  |
| 4. Does not Like Varieties          | 35  |

-----

The number of households growing the ADS II varieties is presented in Table 20. The variety Madame Charmant, developed in the past decade with assistance from an Israeli project, has to some extent been popularized by the ADS II project. The sorghum variety M 5009 was developed in the 1980's under the guidance of the United States Agency for International Development (USAID) funded Integrated Agricultural Development Project (PDAI) and then later popularized by the ADS II project in its sites of intervention. In addition, ADS II has tested a number of other varieties from ICRISAT which are still in the trial phase.

-----  
 Table 20. ADS II Sorghum Varieties Planted Previous Season

| Variety         | % of Sorghum Growing H/holds | % H/holds Growing ADS II Varieties |
|-----------------|------------------------------|------------------------------------|
| Madame Charmant | 14                           | 46                                 |
| M 5009          | 27                           | 92                                 |
| Other Varieties | 6                            | 21                                 |

-----

The most widely planted variety was M 5009, grown by 27% of all farmers. This was followed by Madame Charmant, grown by 14% of households who planted sorghum in the past season. Not surprisingly, M 5009, the most widely grown variety, was also the most preferred (see Table 21.).

-----  
 Table 21. Sorghum Growing Households' Opinions of ADS II Sorghum Varieties

| Opinion        | % of Sorghum Growing Households with Opinion that Answered the Question |              |       |
|----------------|---|--------------|-------|
|                | 5009  | MMe Charmant | Other |
| Like Very Much | 72  | 11           | 7     |
| Like           | 3   | 47           | 34    |
| Do not Like    | 0   | 8            | 2     |
| Do not Know    | 25  | 34           | 25    |

-----

The variety M 5009 was liked very much by some 72% of respondents holding an opinion on the respective varieties. This compares to 11% and 7% respectively for Madame Charmant and other ADS II varieties. No households reported disliking M 5009 although 8% of households did so for Madame Charmant. The reasons for the respondents opinions are presented in Table 22.

-----  
 Table 22. Reasons Given by Households for Liking or Disliking ADS II Sorghum Varieties

| Opinion                 | % of Sorghum Growing Households with Opinion that Answered the Question |               |       |
|-------------------------|---|---------------|-------|
|                         | M 5009  | Mme. Charmant | Other |
| Higher Yield            | 95  | 13            | 15    |
| Good Sized Pannicles    | 2.5   | 0             | 0     |
| Good Stem Strength      | 0   | 6             | 0     |
| Lower Yield             | 2.5   | 52            | 85    |
| Animals Losses too High | 0   | 16            | 0     |
| Plant too low to Ground | 0   | 13            | 0     |

-----

The variety M 5009 appears to be preferred because it offers higher yields. Farmers also reported that it had good sized pannicles of grain, related to its high yielding characteristic. One household, however, gave the opinion the variety was in fact lower yielding. For Madame Charmant, only 13% of households offering an opinion claimed it was higher yielding; indeed over half the respondents (52%) stated it was lower yielding. It would seem this is relative to M 5009 since the majority of opinions were favorable to the variety, with 58% of households claiming they liked or liked very much Madame Charmant. Farmers also expressed the opinion that losses due to animals eating the grains was a problem with this variety. This is perhaps related to the response by 13% of households that the plant was too short and hence easier to pillage by animals than traditional varieties. Of those households offering an opinion to the other ADS II varieties, 11 respondents, or 85% of households, claimed they were lower yielding, whilst 15% stated the opposite.

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## Plant Spacing and Number of Plants

As in the case for maize, the project gave recommended practices for spacing of plants and the number of plants per hill. These innovations were designed to increase overall production.

Of the 107 households that regularly grow sorghum, 91, or 85% of the total, continued to plant their crops in their traditional way. However, only 24 households, or 22% of respondents, actually knew of the ADS II recommended spacing practice. Of these households, 75% had adopted the suggested spacing, a particularly high rate of acceptance (see Table 23.).

---

Table 23. Awareness and Adoption of ADS II Sorghum Planting Practices

| Practice                                | % of Sorghum Growing Households Answering Question |                     |
|---|--|---------------------|
|   | Aware of Practice                                  | Adopter of Practice |
| ADS II Plant Spacing<br>(75 cm X row)   | 22   | 17                  |
| Number of Plants<br>per Hill (2 plants) | -  | 22                  |

---

N.B.: The proportion of sorghum growing households aware of the practice of leaving two plants per hill is not known.

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A similar percentage of households that adopted the ADS II plant spacing practice also adopted the recommended practice of two plants per hill. The proportion of households aware of this second practice is not known. The number of plants grown per hill for those households not adopting the ADS practice was on average some 4.6 plants/hill, a practice pursued by 78% of all households.

## Black Beans

Beans are an important crop in Haiti, both in terms of area planted and as a source of protein in the diet. Of the bean varieties found in Haiti, the black bean is one of the most widespread, grown in both the plains and mountains (see ADS II Report Number 23). This bean is planted both in association with other crops, such as maize and sweet potatoes, and grown separately as a monoculture. A particular advantage of legumes, such as the black bean, is that they can increase the fertility of the soil by being a host to nitrogen fixing bacteria.

Under trials conducted by PDAI, in conjunction with the University of Haiti's Faculty of Agronomy (FAMV), a black bean originating from the Institute of Agricultural Science and Technology (ICTA), Guatemala, was identified as superior to local varieties. This bean, called Tamazulapa (*Phaseolus Vulgaris*), was taken up by the ADS II project for testing in farmer managed trials and later popularized in its sites of intervention.

In the survey, 85 households, or 46% of all respondents, claimed to plant black beans on a regular basis. However, only 41 respondents (22%) grew black beans in the past season. This suggests that a significant number of households grow the bean in the generally wetter first agricultural season. Some 75% of the farmers regularly planting black beans were aware of the variety Tamazulapa, and of these households, 31% planted it the previous season. However, as a proportion of farmers planting beans the past season, some 49% of households planted Tamazulapa.

The total area planted by respondents in black beans was 15.2 ha or 0.37 ha/household. These farmers planted a total of some 694 kg of beans, equivalent to 17 kg/household. In comparison, respondents stated that 5.7 ha, or 38% of the total bean area was planted in Tamazulapa. On average, this equaled 0.29 ha/household. Those households growing Tamazulapa planted a total of 125 kg of seed, or 6 kg/household (see Table 24.).

-----  
 Table 24. Quantity and Area of Black Bean and Tamazulapa Planted and Number of Households Growing the Varieties

|                                  | All Black Beans | Tamazulapa |
|----------------------------------|-----------------|------------|
| Total Area (ha)                  | 15.2            | 5.7        |
| Mean Area/household (ha)         | 0.37            | 0.29       |
| Median Area/household (ha)       | 0.32            | 0.17       |
| Total Seed Planted (kg)          | 694             | 125        |
| Mean Seed Planted/household (kg) | 17              | 6          |
| Median Seed Planted (kg)         | 8.4             | 2.8        |
| Number of Households             | 41              | 20         |

-----

Of all the introduced crop varieties, Tamazulapa has been the most widely adopted both in terms of area and number of households. Adoption of the variety by about half of all households, planting 38% of the total bean area in Tamazulapa, is evidence of the success of the project's popularization program. Also, the fact that the average area planted of Tamazulapa per household is some 78% of the average area planted per household for all black beans is indicative of its strong acceptance among farmers planting the variety.

Those households not planting Tamazulapa were asked to determine which of four pre-coded and non mutually exclusive

responses best represented their viewpoint on why they did not plant the variety. Their responses are presented in Table 25.

-----  
 Table 25. Reasons for not growing Tamazulapa

| Reason                              | % of Households Growing Black Bean and not Planting Tamazulapa |
|-------------------------------------|--|
| 1. Unable to Find Seed              | 20   |
| 2. Insufficient Funds               | 15   |
| 3. Seed was Not Given To Respondent | 10   |
| 4. Does not Like Variety            | 15   |

-----

The most common reason given for not planting Tamazulapa in the past season was that farmers were unable to find the seed. This is corroborated by observations of project personnel: it was noted that demand for the bean exceeded the project's supplies at planting time. Some 15% of households claimed they had insufficient funds to purchase the seed, although it costs no more than traditional varieties, whilst 10% stated they did not plant Tamazulapa because the seed was not given to them. Surprisingly, 10% of farmers claimed to not like the variety although 92% of households wanted to plant the bean the following season.

In total, of those households who were aware of Tamazulapa, 64% expressed a preference for it over traditionally grown black beans. Those farmers answering the preference question, were then asked to indicate among four non mutually exclusive responses the reasons for their preference. In addition, space was made available to record any volunteered responses. These responses are reported in Table 26.

-----  
 Table 26 Reason for Preferring and Not Preferring Tamazulapa over Traditional Black Beans

| Reason                    | % Households Aware of Tamazulapa |
|---------------------------|----------------------------------|
| Higher Yields             | 67                               |
| Later Maturing            | 33                               |
| Drought Resistant         | 59                               |
| Resistant to Mosaic Virus | 42                               |

-----

Most of the households (67%) expressing a preference for Tamazulapa did so because they considered it gave higher yields. Some 59% of respondents also claimed it offered more resistance to drought, and 42% of households stated it resisted virus infection better than traditional black beans. A third of the households did not prefer Tamazulapa because they felt it matured later than local varieties.

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### Animal Husbandry

An important component of the ADS II innovations has been the development of better management techniques in animal husbandry. The goal of these interventions has been to secure higher productivity from households' livestock, reduce losses due to improper practices, and increase participation in animal raising so as to raise household income and protein availability.

Targeted for intervention by the project have been pigs, goats and rabbits. The first interventions were with swine, which had been eradicated from Haiti in 1982-83 in an attempt to

eliminate African Swine Fever. The main focus of project's efforts with pigs was to assist in the reintroduction of the animal into the defined sites of intervention and ensure as many households could return to raising pigs as soon as possible (see ADS II Report Number 32). In addition, farmers were advised on the best methods to raise the introduced animals and in the use of feedstuffs.

Due to the widespread raising of goats in the project's sites of intervention, an effort was also made to improve the productivity of the local breed. This involved the introduction of a hybrid Alpine-Nubian billy goat for breeding purposes. This introduced animal was a product of a USAID funded Haitian goat research program undertaken by Winrock International between 1982-1987.

The other livestock development undertaken by the project was the introduction of rabbit raising in well aerated and spacious pens. For many of the households participating in the ADS II rabbit program it was the first time they had reared such animals.

## Pigs

To ensure the largest possible number of households were able to participate in the raising of reintroduced pigs, the ADS II project set up a distribution program to give pigs to farmer associations or cooperatives in its sites of intervention. The pigs themselves were provided by two breeding centers managed by the project, with animals supplied by the swine repopulation program of the Interamerican Institute of Agricultural Cooperation (IICA). Those associations receiving animals were obliged to furnish the project a female piglet out of their first litter, which in turn was redistributed to other associations. In addition to distributing pigs, the project also organized seminars on the best method to care for the animals and how to construct pig pens. Advice was also given on the treatment of swine health problems and the use of local feeds as an alternative to expensive imported feed.

Some 26% of the 184 households surveyed reported being members of a pig cooperative, of which 96% had received a pig from the ADS II distribution program. However, only 24 respondents, or 13% of all households were actually raising pigs themselves.

The 48 respondents who reported to be members of pig cooperatives were asked to indicate among four non mutually exclusive responses the contribution they had made to their association. Their responses are presented in Table 27.

-----  
Table 27. Members' Contributions Towards their Pig Cooperative

| <u>Contribution</u> | <u>% of Households belonging to a Cooperative</u> |
|---------------------|---|
| Money               | 79  |
| Labor               | 71  |
| Materials           | 63  |
| No Contribution     | 4   |

-----

Observation of Table 27. shows that most members made significant contributions to their particular cooperatives with 79% supplying funds, 71% donating their labor and 63% contributing materials. Only 4% of respondents contributed nothing.

Those households raising pigs themselves, whether in association or privately, were asked to state how many animals they tended, and if these were owned in association with others or not. The 22 households responding to the question were raising a total of 66 animals, of which 57 (86%) were owned outright by the households concerned. On average, three pigs were tended per household although the median was half this amount, indicating that most households had fewer than three pigs (see Table 28.)

-----  
Table 28. Number of Pigs Kept By Households

|        | <u>Owned Collectively</u> | <u>Owned Personally</u> |
|--------|---------------------------|-------------------------|
| Mean   | 3                         | 2.6                     |
| Median | 1.5                       | 1                       |

-----

### Rabbits

Towards the end of 1986, the ADS II project initiated the construction of rabbit hutches with 30 participating households. Each household that helped in the construction of the hutches received one hutch along with a breeding pair. In return, the households were obligated to furnish the project two females and two males from their first litters, which were then redistributed to other interested households.

The objective of the intervention was to provide an additional source of income and dietary protein to households. Although rabbit raising is practiced in the Les Cayes Plain, the conditions in which the rabbits are traditionally raised are often cramped and unclean. By demonstrating an alternative raising system, the project hoped not only to increase the number of households raising rabbits but also to improve, by example, the conditions in which rabbits are raised in traditional systems. This in turn would help reduce animal losses in the traditional raising systems.

Thirty one households, or 17% of all respondents, claimed to be raising rabbits. Of these households, 81% had obtained their animals themselves and the remainder had done so through the assistance of the project (23%) or as a gift (3%) (see Table 29).

-----  
 Table 29. How Rabbits were Obtained by Households

| Method      | % All Households | % Households Raising Rabbits |
|-------------|------------------|------------------------------|
| From ADS II | 4                | 23                           |
| Bought      | 14               | 81                           |
| Gift        | 0.1              | 3                            |

-----

All those households who obtained their rabbits through the project used the ADS II rabbit pens. The other households, or 74% of respondents answering the question, had built rabbit pens using their own design. The average number of rabbits raised per household was 5.7 animals and the median number was 5.

To ascertain the potential for rabbit raising in the sites of intervention, all respondents were asked if they would like to keep rabbits. Some 64% of all respondents claimed they would like to raise the animals. Those persons responding to the question were then asked to choose among five non mutually exclusive responses the reason for their response (see Table 30.).

-----  
 Table 30. Reasons for and for Not Wanting to Raise Rabbits

| Reasons For Wanting Rabbits | % of all Households |
|-----------------------------|---------------------|
| 1. Source of Meat           | 57                  |
| 2. Source of Revenue        | 60                  |

| Reasons For Not Wanting Rabbits      | % of all Households |
|--------------------------------------|---------------------|
| 1. Not Familiar With Raising Rabbits | 5                   |
| 2. Not Accustomed to Eating Rabbits  | 4                   |
| 3. Rabbit Pen Too Expensive          | 2                   |

-----

The two reasons why households wanted to raise rabbits were: one, they provide a supply of meat, considered important by 57% of respondents; and two, they are source of revenue, considered important by 61% of households. The major reasons for not wanting to raise rabbits were that households were unaccustomed to raising and eating rabbits, stated respectively by 5% and 4% of respondents. Some 2% of households claimed that a rabbit pen would be too expensive.

The respondents wanting to raise rabbits were also asked if they were interested in building a pen like that introduced by the ADS II project. In addition, they were then asked to indicate a reason for their response among two precoded replies or to supply their own reasons. In total, 41% of households expressed a desire to build the ADS II type raising pen. Unfortunately, the number of respondents who were actually aware of the ADS II rabbit pen is not clear since this question was not included in the questionnaire. The respondents' reasons for not wanting to build the ADS II rabbit hutch are presented in Table 31.

-----  
 Table 31. Reasons For Not Wanting To Build the ADS II Rabbit Pen

| Reason                         | % of all Households |
|--------------------------------|---------------------|
| 1. ADS II Pen too Expensive    | 8                   |
| 2. ADS II Pen not Solid Enough | 21                  |

-----

Interestingly, the main reason why households were not disposed to build the ADS II pen was that they considered it insufficiently strong. However, in comparison with traditional type rabbit pens the ADS II type holds up very well and was given a favorable response by households participating in the rabbit program. Some 8% of respondents claimed the ADS II pen was too expensive to build.

### Goats

In a strategy to increase the productivity of the local goat breed, the project introduced an Alpine-Nubian cross billy goat into the hill-side site of Fond-des-Frères. The objective was to mate this animal with as many females of the local breed as possible and then compare the progeny with non crossed animals. The service, began in the early part of 1987, was performed free of charge for those households wanting their nannies inseminated by the introduced goat.

63 households, or 34% of all respondents, raised goats in the project's sites of intervention. The average number of goats tended and the number actually owned by households is presented in Table 32. The difference between the number of goats tended and owned is explained by the practice of "gardienage" where persons raise animals for the owners in return for some recompense, often in kind.

-----  
 Table 32. Number of Goats Tended and Owned by Households

|        | Number of Goats Tended | Number of Goats Owned |
|--------|------------------------|-----------------------|
| Mean   | 3.6                    | 2.3                   |
| Median | 3                      | 2                     |

-----

The average number of goats tended per household was 3.6 animals with the average number owned being 2.3. As a proportion of the total number of goats, only 64% were actually owned by the households keeping them, indicating the widespread practice of "gardienage".

Only one household reported to have used the services of the introduced billy goat. This low number is explained by the fact that the animal only arrived on the site in the early part of 1987 and, hence, has been able to breed with just a few animals. The potential for the introduced goat's services is, however, considerable since 97% of respondents raising goats expressed a willingness to breed their females with the billy.

### Soil Conservation

A major component of the ADS II interventions in the hill-side site of Fond-des-Frères has been the introduction of soil conservation practices. This work was first initiated in the second half of 1985 with the use work parties (groupements) composed of local farmers. The participants in the work received a small contribution for their efforts. Unfortunately, soon after starting the work a number of persons demanded a considerably higher wage equal to that paid to workers in nearby government project. Since this ran contrary to the project's belief that farmers must feel the need to conserve the soil themselves rather than doing it for financial remuneration, the work was discontinued.

In the second agricultural season of 1986, soil conservation strategies were reinitiated at Fond-des-Frères working with individual farmers who expressed a desire to undertake the work themselves. This work involved the tracing of the contours on the farmer's hill-sides every 5 or 10 meters and then supplying the household with perennial grasses and trees after the farmer had prepared the soil. To encourage these efforts, the supplied grasses and trees were given free of charge to the participating households. In addition, a contribution of one gourde/2 metres of contour canal was offered to farmers to defray some of their labor costs. This amount was to be paid several months after the construction of the canals when their successful establishment and maintenance could be verified.

Some 96% of the households interviewed at Fond-des-Frères were farming land in the mountains. This represented about 32 ha of land or, on average, 1.4 ha per household. Of this total, some 68% was owner occupied and the remainder was farmed under a share-cropping or leasehold arrangement. The area of land conserved by soil conservation practices was some 8.9 ha, or about 28% of the total. This conservation work was undertaken by 14 households, or 63% of respondents farming land in the mountains. Of the land conserved, 64% was owner occupied and 36% was either leased or sharecropped. Of the non conserved land, 68% was owner occupied and 32% sharecropped/leasehold (see Table 33.).

Surprisingly, the proportion of owner occupied land conserved was almost the same as the proportion for land not conserved. One would expect that the proportion of owner occupied land conserved to be higher than the proportion for non conserved land since the benefits of soil conservation are generally long term and hence are difficult to recoup for sharecropping and leasehold farmers.

One reason why sharecroppers/leaseholders may still find it desirable to undertake conservation measures is that the costs incurred in this effort may be sufficiently small, due to project subsidization, to be recovered in a relatively short period of time. Further, the benefits for farmers, owners and sharecroppers alike, start occurring within a few months of the establishment of living terraces. For example, these terraces not only maintain the soil in place but also provide an important feed source for animals such as goats and pigs.

-----  
 Table 33. Total Area of Land by Land Tenure Conserved and Not Conserved at Fond-des-Frères

|                     | Area (ha) | % of Total Area |
|---------------------|-----------|-----------------|
| Conserved           |           |                 |
| Owner Occupied      | 5.7       | 18              |
| Sharecropped/leased | 3.2       | 10              |
| -----               | ---       | ---             |
| Total               | 8.9       | 28              |
| Not Conserved       |           |                 |
| Owner Occupied      | 15.6      | 49              |
| Sharecropped/leased | 7.3       | 23              |
| -----               | ---       | ---             |
| Total               | 22.9      | 72              |
| Grand Total         | 31.8      | 100             |

-----

The majority of the soil conservation work undertaken by farmers at Fond-des-Frères was done with the assistance of the ADS II project. Some 6% of households performed the work on their own initiative and 12% had undertaken the practices with another project before the arrival of ADS II in the area (see Table 34.).

-----  
 Table 34. Manner by which Households Undertook Soil Conservation Work

| Manner        | % of Households Conserving Land |
|---------------|---------------------------------|
| ADS II        | 71                              |
| Other Project | 12                              |
| Self          | 6                               |

-----

Although it is encouraging to observe the high participation in the ADS II soil conservation program, the fact only 6% of households actually undertook the effort themselves before and after the arrival of the project is disappointing. It is hoped that a much greater proportion will take up the soil conservation effort on their own at the termination of the project. To aid in this goal, the ADS II project has established a tree nursery on site in Fond-des-Frères as well initiating a continuing education program with farmers on the need and value of conservation practices.

All farm households surveyed at Fond-des-Frères were asked if they wished to participate in soil conservation practices and their reasons for wanting or not wanting to participate. For owner occupied land, some 100% of all respondents said they wanted to help conserve their land. No households said they did not wish to undertake conservation measures. The reasons why households want to be involved in soil conservation on the land they own are presented in Table 35. These responses represent the households' viewpoints on the three precoded and non mutually exclusive replies listed in the questionnaire. In addition, space was made available to record volunteered responses of households.

-----  
 Table 35. Reasons why Households Want to Conserve the Land They Own

| Reason                    | % of Households<br>Owning Land | % of all Households |
|---------------------------|--------------------------------|---------------------|
| Preserves Soil            | 100                            | 92                  |
| Gives Better Yields       | 100                            | 92                  |
| Receive Money from ADS II | 95                             | 88                  |

-----

Observation of Table 35. shows that households are aware of the benefits of soil conservation, with all households who own their own land stating it would protect their soil and provide better yields. A large proportion of respondents who are owner occupiers (95%) also stated that the contribution they receive from the ADS II project is another reason to undertake the work.

The same questions were asked of households who worked land by not owned by them. All households who lease/sharecrop land indicated they would want to conserve this property and no respondents stated they did not want to conserve this land. The reasons for their responses are presented in Table 36.

All sharecropping/leasing respondents felt that soil conservation measures would protect the soil of the property and improve yields. An added incentive for their work no doubt was the desire of all households to purchase the land they would like to conserve. Unfortunately, the incentive of receiving a contribution of money from ADS II for carrying out the work was neglected from the precoded response, hence, its importance to sharecropping/lease-holding farmers in influencing their

decision to undertake conservation work is not known.

-----  
 Table 26. Reasons why Households Want to Conserve the Land they Sharecrop or Lease

| <u>Reason</u>        | <u>% of Households with Sharecropped/Leased Land</u> | <u>% of all H/holds</u> |
|----------------------|--|-------------------------|
| Good for the Soil    | 100  | 58                      |
| Hope to Buy the Land | 100  | 58                      |
| Gives Better Yields  | 100  | 58                      |

-----

The ADS II project has implemented a number of complementary strategies in its soil conservation efforts at Fond'des-Frères. These include the establishment of living terraces every 5 or 10 metres planted with perennial grasses, and the seeding of leucaena, a leguminous tree, as well as the planting of a number of different varieties of trees. The living terraces were adopted in preference to dry wall structures due to the nature of Fond-des-Frères where rocks of sufficient size are not found in enough abundance to erect stone barriers/walls. To ascertain the awareness and opinion of these interventions by households, respondents were asked to verify among a list of conservation measures whether they knew of the activity, if they liked it, and the reason for their response. Partial results are presented in Table 37.

The most well known soil conservation measure was the planting of trees. The highest recognition rates were for the trees most commonly found in the area including, "bois blanc" (*Simarouba glauca*) (88%), "bois pele" (*Colubrina arborescens*) (88%), lemons (88%) and oranges (83%). Awareness of leucaena and mahogany was also high, with three quarters of respondents aware of the trees for conservation purposes. The highest rates of acceptance were for the trees that provided timber such as "bois blanc" and "bois pele", liked by all households aware of them. Orange, lemon and mahogany trees were also well accepted, liked by over three quarters of those respondents aware of the measures. The fruit trees were appreciated for eating and providing juice, an opinion held by 81% and 70% of households respectively for lemons and oranges. Another advantage of planting lemons was the ability to sell its fruit, considered a reason for liking the tree by a third of the households aware of it as a conservation measure. Mahogany was liked for its ability to provide quality wood for furniture, considered important by 72% of households recognising the tree. Appreciation of leucaena was less because a number of households felt that it established itself too successfully and took over their land, a viewpoint held by 22% of households who knew of leucaena. The least well known tree for conservation measures was "nime", in which only 17% of households knew of it.

The other measures widely known by households were the contour canals or living terraces and the planting of Napier grass, both known by 75% of all households interviewed. Each of these measures were liked by all respondents who were aware of them. The reason given for liking Napier grass was that it provided forage for livestock, an opinion held by 89% of households aware of the grass. Contour canals were liked because they helped preserve soil moisture, a viewpoint held by 6% of households, and because they protected the soil, stated by 89% of respondents aware of the practice. Rock barriers and dry walls were less well known with respectively, 21% and 46% of households aware of these measures. The low recognition rates for these measures is, however, not surprising since they have not been implemented by the project at Fond-des-Frères. Hence, recognition of these measures probably originates from rock wall structures found in neighbouring sites in close proximity to Fond-des-Frères.

-----  
 Table 37. Awareness and Opinion of Soil Conservation Measures  
 Undertaken by the ADS II Project

| Measure                      | % of H/holds<br>Aware of Intervention | % of H/holds Like<br>the Intervention |
|------------------------------|---------------------------------------|---------------------------------------|
| <u>Tree Planting/Seeding</u> |                                       |                                       |
| Bois Blanc                   | 38                                    | 100                                   |
| Bois Pele                    | 88                                    | 100                                   |
| Oranges                      | 83                                    | 80                                    |
| Lemon                        | 88                                    | 76                                    |
| Leucaena                     | 75                                    | 56                                    |
| Nime                         | 17                                    | 50                                    |
| Mahogany                     | 75                                    | 83                                    |
| Accacia                      | 0                                     | -                                     |
| Other Trees                  | 0                                     | -                                     |
| <br><u>Other Measures</u>    |                                       |                                       |
| Contour Canals               | 75                                    | 100                                   |
| Napier Grass                 | 75                                    | 100                                   |
| Rock Barriers                | 21                                    | 100                                   |
| Dry Walls                    | 46                                    | 100                                   |

-----

## V. Summary

A study was undertaken between April and June 1987 on the rates of adoption by households and their reasons for and for not adopting farming systems innovations introduced by the ADS II project in its four major sites of intervention.

A high degree of recognition of the project existed, with 75% of all respondents reporting they were aware of at least one its activities. The vast majority of households were aware of the project through interaction with project personnel.

Recognition rates among households for cropping practices introduced by ADS II were 60%, 64%, 67% and 69% respectively for black beans, rice, sorghum and maize. The highest participation rate as a proportion of all households was for sorghum (21%) with the lowest, 11%, for black beans.

Among all ADS II innovations, as a proportion of the relevant number of households affected by the interventions, soil conservation measures had the highest participation rate at 58%. The lowest participation rate was recorded for the ADS II goat breeding program.

Of households surveyed growing rice in the past season, 19% planted ADS II varieties. In area, the introduced varieties accounted for 12% of the land in rice production. The most widely grown variety was CIAT 16, planted by 12% of rice growing households. The most preferred variety was Amina (IR-5931-113-1), liked very much by 75% of respondents growing ADS II rice varieties. Amina's popularity was based on its high yields. Some 58% of rice growing households were aware of the ADS II portable rice thresher and 23% were adopters.

Around 31% of maize growing households planted ADS II varieties. The introduced varieties represented 16% of the total land cultivated in maize. The most widely grown ADS II variety was selected Chicken Corn, grown by 24% of households planting maize. The variety La Maquina was grown by 6% of respondents cultivating maize. The best liked variety was selected Chicken Corn, liked very much by 73% of respondents. Its popularity was based on its faster maturation and higher yields than other varieties. Some 30% of households were aware of the ADS II recommended practices for plant spacing for maize and 28% were actually practicing the recommendations. A similar proportion adopted the project's advice of thinning to only two maize plants per hill.

Almost half (47%) of sorghum growing households planted ADS II varieties. These varieties accounted for 14% of the land in sorghum. The most popular and widely grown variety introduced by the project was M 5009. This variety was liked very much by 72% of respondents. Its popularity was due to its higher yields, felt to be important by 95% of all respondents liking it. Some 22% of respondents were aware of ADS II plant spacing practices

and 17% of sorghum growing households followed these recommendations. Around 22% of respondents growing sorghum adopted the recommended practice of retaining two plants per hill.

In the past season, 49% of households planting black beans grew Tamazulapa, a variety popularized by ADS II. This variety accounted for 38% of the respondents' land cultivated in black beans. Tamazulapa was favored because of its higher yields and drought resistance, considered important respectively by 67% and 59% of respondents.

Some 26% of households surveyed were members of pig cooperatives, of which 96% had received pigs through the ADS II distribution program. The main contribution of members to their cooperatives were money, labor and materials given respectively by 79%, 71% and 63% of respondents.

Around 17% of all respondents raised rabbits of which 23% had obtained their animals through the ADS II rabbit program. Respectively, some 57% and 60% of households expressed a desire to raise rabbits as a source of meat and as a source of revenue. Some 5% of all respondents did not want to keep rabbits because they were unaccustomed to raising the animals. Of those households wanting to raise rabbits, 41% expressed a desire to build a hutch similar to that introduced by the ADS II project.

Only one household out of 63 respondents raising goats had used the services of the introduced Alpine-Nubian billy goat. This small percentage is due no doubt to the late arrival of the billy at the project's intervention sites. Some 97% of goat raising households expressed a desire to mate their female goats with the hybrid billy.

In the hill-side site of Fond-des-Frères, 64% of households had erected soil conservation structures. In total area, 28% of respondents' land was conserved. A high awareness of the benefits of soil conservation existed among households in the area, with 100% of respondents performing conservation because it preserves the soil and gives better crop yields. The contribution given by ADS II to households was considered important by 95% of respondents. Of all conservation measures, respondents were most aware of tree planting, the use of living terraces and the planting of perennial grasses.

APPENDIX 1

A D S II / K A Y

Ankèt sou kouman popilasyon an wè aktivite pwojè-a.

(Menaj)

(Anketè \_\_\_\_\_  
Dat koze-a \_\_\_\_\_

A- KOTESANS AVEK ANKETE-A.

Kouman chef kay-la relé? \_\_\_\_\_

Koté kay ou yé, kouman'l relé? \_\_\_\_\_

Nan ki seksyon riral lokalite sa a yé? \_\_\_\_\_

Nan ki komin seksyon riral la yé? \_\_\_\_\_

Ki nimewo SNEM kay-la? \_\_\_\_\_

(Anketè, bay menaj yo yon nimewo nan lòd ke ou vizite yo)

\_\_\_\_\_

B- ENFORMASYON JENERAL.

1. Eske ou kon'n yon pwojè ki relé ADS 2?

1. wi  , 2. non

Si wi, kouman ou fè konnen ADS 2?

1. pa radio.....  3. pa teknisyen ADS 2 yo   
2. pa you moun.....  4. pa lòt fason. ....

2. Eske ou konnen ki sa pwojè-sa a ap fè?

1. wi  , 2. non

3. Eske ou kon'n aktivite sa-yo e eske ou patisipe ladan yo?

(1 pou wi, 2 pou non).

|     | <u>Men aktivite-yo</u>                       | <u>ou konnen</u>         | <u>ou patisipe</u>       |
|-----|--|--------------------------|--------------------------|
| 1.  | Fè eseye plante e fè konnen semans diri...   | <input type="checkbox"/> | <input type="checkbox"/> |
| 2.  | Fè eseye plante e fè konnen semans mayi...   | <input type="checkbox"/> | <input type="checkbox"/> |
| 3.  | Fè eseye plante e fè konnen semans pitimi... | <input type="checkbox"/> | <input type="checkbox"/> |
| 4.  | Fè eseye plante e fè konnen semans pwa...    | <input type="checkbox"/> | <input type="checkbox"/> |
| 5.  | Ede moun jwen'n kochon.                      | <input type="checkbox"/> | <input type="checkbox"/> |
| 6.  | Ede moun jwen'n lapon.                       | <input type="checkbox"/> | <input type="checkbox"/> |
| 7.  | Ede moun amelyore ras kabrit-yo.             | <input type="checkbox"/> | <input type="checkbox"/> |
| 8.  | Ede moun pwoteje tè jaden.                   | <input type="checkbox"/> | <input type="checkbox"/> |
| 9.  | Fè moun itilize batez nan bat diri.          | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. | -----  | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. | -----  | <input type="checkbox"/> | <input type="checkbox"/> |

(Si tout repons kesyon 3 - sa 2 = non, ankèt-la fini).

4. Eske ou abitye plante diri nan tè ou travay?

1. wi  , 2. non

5. Sazon pase-a, eske ou te plante diri?

1. wi  , 2. non

(si se non pase nan kesyon 11).

6. Antou ki kantite tè ou te plante an diri?

ki kantite semans ou te itilize?.....

Karo  
Manit

7. Sazon pase-a, eske ou te plante varyete diri ADS 2 yo?

1. wi  , 2. non

8. Si non, pou ki rezon? (e pase nan kesyon 11)

- 1. Mwen pa te jwenn somans achte .....
- 2. Mwen pa te gen lajan .....
- 3. Paske vo pa te ban'm .....
- 4. Mwen pa renmen semans diri ADS 2 yo .....
- 5. -----

9. Si wi, ki varyete?

- 1. Amina  , 2. Ti Rose  , 3. CIAT 13.
- 4. CIAT 16  , 4. Diri plivial  , 5. \_\_\_\_\_
- 6. \_\_\_\_\_  , 7. \_\_\_\_\_  , 6. Mwen pa konnen

10. Ki kantite tè ou te plante an varyete diri ADS 2 sa-yo?

ki kantite semans ou te itilize?.....

Karo e  
Manit

11. Eske ou kontinye plante diri-yo men'm jan ou te kon'n-plante'l anvan ADS 2?

1. wi  , 2. non

12. Eske ou konnen kombyen jou ke plan diri dwe pase nan pepiniè?

1. wi  , 2. non

(si se non, pase nan kesyon 14).

13. Si se wi, kombyen jou li dwe pase nan pepiniè? \_\_\_\_\_ jou.

14. Kombyen jou plan diri-ou te pase nan pepiniè anvan ou te repike'l?

- 1. mwens p 20 jou  4. plis ke 30 jou
- 2. 20 jou  5. mwen pa ke konnen
- 3. 21 à 30 jou  6. -----

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15. Pou ki rezon?

1. Mwen pa konnen, se konsa mwen leve jwen'n li
2. Paske se lè ya mwen te gen tan
3. Paske se teknisyen ADS 2 yo ki di'l
4. -----

16. Eske ou kontinye rekolte diri-a men'm jan ou te kon rekolte anvan ADS 2?

1. wi  , 2. non

17. Eske ou kon'n wè ou byen ou kon'n tandè pale de batez diri ADS 2 yo?

1. wi  , 2. non

(Si se non pase nan kesyon 24)

18. Eske ou kon'n sèvi avek batez pou bat diri?

1. wi  , 2. non

19. Eske ou wè batez-la empòtan pou ou?

1. wi  , 2. non

20. Pou ki rezon? (1 = wi, 2 = non)

1. Paske travay rekolt ak bat-la fèt vit
2. Paske jan de bat sa a fè pèdi anpil gren'n diri
3. Paske li fè ou pa konsève manje bèt ou
4. Paske tè-a te netwaye
5. -----
6. Mwen pa konnen

21. Eske ou ta renmen gen you batez?

1. wi  , 2. non

22. Si batez la ap koute ou 150 pias, eske wap achte?

1. wi  , 2. non

(Si wi, ankete, ale nan kesyon 24).

23. Si se non, pou ki sa?

1. Paske mwen pa gen ase lajan
2. Paske batez la twò chè
3. Paske mwen ka fè'l tou
4. -----
5. Mwen pa konnen

24. Eske ou kon'n varyete diri ADS 2 yo ou byen eske ou kon'n tande pale de yo?

1. wi  , 2. non

(Si se non, anketè ale nan kesyon 27).

25. Nan tout varyete diri ADS 2 yo, ki es : (1) ou pi renmen, (2) mwens renmen, (3) pa renmen min'm, (4) ou pa konnen, e pou ki rezon?

Men non varyete yo

Bay rezon yo

|                 |                          |       |
|-----------------|--------------------------|-------|
| 1. Amina        | <input type="checkbox"/> | _____ |
| 2. Ti Raso      | <input type="checkbox"/> | _____ |
| 3. Ciat 13      | <input type="checkbox"/> | _____ |
| 4. Ciat 16      | <input type="checkbox"/> | _____ |
| 6. Diri plivial | <input type="checkbox"/> | _____ |
| 7. ....         | <input type="checkbox"/> | _____ |
| .....           | <input type="checkbox"/> | _____ |

26. Nan sezon diri kap vini-an, eske ou ta renmen plante varyete ADS 2 yo?

1. wi  , 2. non

D- MAYI

27. Eske ou on'n plante mayi?  
1. wi , 2. non   
(Si se non, anketè, ale nan ~~kesyon~~ kesyon 40).
28. Sezon pase a, oske ou te plante mayi?  
1. wi , 2. non   
(Si se non, pase nan kesyon 34).
29. Antou ki kantite tè ou te plante en mayi sezon pase a?  karo e  
ki kantite semans ou te itilize?.....  manit.
30. Eske ou to gen varyete ADS 2 nan mayi ou te plante sezon pase a?  
1. wi , 2. non
31. Si se non, pou ki rezon? (e pase nan kesyon 34)
1. Mwen pa te jwen semans achte.....
  2. Mwen pa te gen lajan.....
  3. Mwen pa ronnen semans mayi ADS 2 yo.....
  4. Paske yo pa te ban'm.....
  5. -----
32. Mayi ADS 2 a se te ki varyete?
1. Chicken ~~kayamelyore~~ , 2. Makina.....
  3. ----- , 4. Mwen pa konnen.....
33. Ki kantite tè ou te plante ak varyete ADS 2?.....  karo e  
ki kantite semans ou te itilize?.....  manit
34. Eske ou kontinye plante men'm jan ou te kon'n plante'l anvan ADS 2?  
1. wi , 2. non
35. Eske ou konnen ak ki espas ADS 2 kenseye pou plante mayi?  
1. wi , 2. non
36. A ki distans ou te foye twou mayi ou yo?
1. Min'm distans dopi lontan an :.....
  2. Distans ke ADS 2 te bay : (75 x 50 cm).....

- 3. -----
- 4. Mwen pa konnen . . . . .

37. Kombyen plan ou ka kite nan yon twou mayi?

- 1. Anpil (yon - - - - a - - - - plan).....
- 2. Kantite ke ADS 2 te di ( - - - - - plan). . . . .
- 3. - - - - - (- - - - - plan). . . . .
- 4. Mwen pa konnen regle kombyen plan . . . . .

38. Eske ou kon'n varyete mayi ADS 2 yo ou byen eske ou kon'n tande pale de yo?

- 1. wi  , 2. non

(Si se non, anketè ale nan kesyo 41).

39. Nan tout varyete ADS 2 yo, ki les : (1) ou pi renmen, (2) mwen renmen, (3) pa renmen min'm, (4) ou pa konnen.

| <u>Mwen non varyete yo</u>                      | <u>Bay rezon yo</u> |
|---|---------------------|
| 1. Chicken kò anelyore <input type="checkbox"/> | _____               |
| 2. Makina. . . . . <input type="checkbox"/>     | _____               |
| 3. - - - - - <input type="checkbox"/>           | _____               |

40. Nan sezon mayi kap vini an, eske ou ta renmen plante varyete ADS 2 yo?

- 1. wi  , 2. non

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E- PITIMI

41. Eske ou kon plante pitimi?  
1. wi  , 2. non   
(Si se non, anketè, ale nan pwa, kasyon 55).
42. Sezon pase a, eske ou te plante pitimi?  
1. wi  , 2. non   
(Si se non, pase nan kasyon 48).
43. Antou sa fè ki kantite tè ou te plante an pitimi?  
ki kantite semans ou te itilize? .....  karo e  
.....  manit
44. Eske ou te gen varyete ADS 2 nan pitimi ou te plante sezon pase a?  
1. wi  , 2. non
45. Si se non, pou ki rezon? (o pase nan kasyon 48)
- 1. Mwen pa te jwenn semans achte .....
  - 2. Mwen pa te gen lajan .....
  - 3. Mwen pa renmen semans pitimi ADS 2 yo .....
  - 4. Paske yo pa te ban'm .....
  - 5. ----- .....
46. Pitimi ADS 2 a sa te ki varyete?  
- M 50009 .....  - Mne Charmant .....   
- Let varyete yo .....  ----- .....
47. Ki kantite tè ou te plante ak varyete ADS 2? .....  karo o  
ki kantite semans ou te itilize? .....  manit
48. Eske ou konplè plantè pitimi men'm jan ou te konplè plantè'l anvan  
ou te konplè ADS 2?  
1. wi  , 2. non
49. Eske ou konnen a ki distans ADS 2 te eseye pou plante pitimi?  
1. wi  , 2. non
50. A ki distans ou te faye twou pitimi ou yo?
- 1. men'm distans depi lontan an .....
  - 2. distans ke ADS 2 te bay .....
  - 3. ----- .....

51. Kombyen plan ou ka kite nan yon twou pitimi?

1. ampil (yon- - - - - à - - - - - plan) . . . . .
2. Kantite ke ADS II te di ( - - - - - ) . . . . .
3. - - - - - . . . . .
4. Mwen pa konnen regle kombyen plan . . . . .

52. Eske ou kon varyete pitimi ADS 2 yo ou byen eske ou kon'n tande pale de yo?

1. wi  , 2. non

(Si se non, anketè, ale nan kosyon 55).

53. Nan tout varyete pitimi ADS 2 yo, kiles : (1) ou pi renmen, (2) mwen renmen, (3) pa renmen men'm (4) ou pa konnen, e pou ki rezon?

Men non varyete yo

Bay rezon yo

1. Mme Charmant . . . . .  \_\_\_\_\_  
 - . . . . .  \_\_\_\_\_  
 2. M 50009 . . . . .  \_\_\_\_\_  
 - . . . . .  \_\_\_\_\_  
 3. Lèt varyete yo . . . . .  \_\_\_\_\_  
 - . . . . .  \_\_\_\_\_

54. Nan sezon pitimi kap vini an, eske ou ta renmen plante varyete pitimi ADS III?

1. wi  , 2. non

F- PWA

55. Eske ou kon plante pwa?

1. wi  , 2. non

(Si se non, anketè, ale nan elvaj, kesyon 64)

56. Sezon pase a, esle ou te plante pwa?

1. wi  , 2. non

(Si se non, pase nan kesyon 61).

57. Antou ki kantite tè ou te plante en pwa?

ki kantite semans ou te itilize?.....

Karo e

Manit

58. Eske ou te genyen Tamazulapa nan pwa ou te plante yo?

1. wi  , 2. non

59. Si se non, pou ki rezon? (e pase nan kesyon 61)

1. Mwen pa te jwenn semans achte .....

2. Mwen pa te gen lajan .....

3. Mwen pa te renmen semans Tamazulapa .....

4. Paske yo pa te ban'm .....

5. - - - - - .....

60. Ki kantite tè ou te plante en Tamazulapa?

ki kantite semans ou te itilize? .....

Karo e

Manit

61. Eske ou kon'n varyete pwa Tamazulapa ou byen eske ou kon'n tande pale de li?

*oui*  *non*

62. Eske ou prefere Tamazulapa-<sup>af</sup> varyete pwa ou te kon'n plante yo?

1. wi  , 2. non

63. Pou ki rezon? (1, wi a 2, non).

1. Paske Tamazulapa dennen plis .....

2. Paske Tamazulapa pran plis tan .....

3. Paske Tamazulapa rezistan a secheres ...

4. Paske Tamazulapa rezistan a mozayik

5. - - - - - .....

*63.a) man 2-3on plis kap vini an estè ou la reman-  
plante varyete Tamazulapa*

F- ELVAJ

64. Eske ou fè pati gwoup kochon ADS 2 ?

1. wi  , 2. non

(Si se non, pase nan kesyon 67).

65. Ki kontribisyon ou te bay pou gwoupman kochon te ka fòme?

1. Mwen te bay lajan (----- goud)

2. Mwen te bay kouraj mwen

3. Mwen te bay kèk materio

4. Mwen pa te bay anyen

66. Eske ou jwenn ti kochon pa ou deja?

1. wi  , 2. non

67. Eske ou fè elvaj kochon?

1. wi  , 2. non

(Si se non, pase nan kesyon 69).

68. Konbyen kochon ou gade?  e konbyen ki pou ou?

69. Eske ou gen lapen?

1. wi  , 2. non

(Si se non, pase nan kesyon 73).

70. Konbyen ou genyen?  lapen.

71. Kouman ou fè genyen lapen?

1: ADS 2

2: achte

3: kado

4: --

72. Kouman ou te fè gen daj pou lapen ou yo?

1: ADS 2

2: m' te bati

3: -----

73. Eske ou ta renmen gen lapen?

1. wi  , 2. non

(Si se wi, pase nan kesyon 75)

74. Si se non:

Pou ki sa ou pa ta renmen gen lapen? (e pasc nan kosyon 74)

- 1) paske n'pa konnen gade lapen . . . . .
- 2) paske n'pa abitye manje lapen . . . . .
- 3) paske kalòj lapen koute twò chè . . . . .
- 4) - - - - -

75. Si se wi:

Pou ki sa ou ta renmen gen lapen?

- 1) poun'ka jwenn viann pou n' manje . . . . .
- 2) poun'ka vann pou n' fè lajan . . . . .
- 3) - - - - -

76. Si se wi, eske ou dispoze konstwi yon kay kou pa ADS 2 yo?

1. wi  , 2. non

77. Pou ki rezon.

1. paske li twò chè . . . . .
2. paske griyaj la pa ase solid . . . . .
3. - - - - -
4. - - - - -
5. - - - - -

78. Eske ou gen kabrit ouap elve?  
1. wi  , 2. non   
(Si non, pase a konsèvasyon sòl, kesyon 84).
79. Kombyen kabrit ou genyen ouap elve?  kabrit.
80. Nan kabrit ouap elve-yo, kombyen ki pou ou?  kabrit.
81. Eske ou te kwase kabrit ou yo avek bouk kabrit ADS 2 a?  
1. wi  , 2. non   
(Si non, pase a kesyon 83).
82. Ti kabrit ki te sòti nan kwazman sa yo, koman yo te ye?  
1. bon  , 2. pa bon
83. Eske ou ta renmen kwaze kabrit avek kabrit nubian ADS 2,  
1. wi  , 2. non

3- KONSERVASYON SOL

84. Ki kantite tè ou travay nan mòn  
(Si zero, ankèt la fini) --- Karo
85. Nan tè mòn ou travay yo, ki kantite ki konsève? --- Karo
86. Nan tè mòn ou travay yo, ki kantite ki pou ou? --- Karo
87. Nan tè mòn ki pou ou, ki kantite ki konsève?  
(Si zero, pase nan kesyon 89) --- Karo
88. Kouman ou te fè pou ou te fè travay konsèvasyon sòl tè a ou yo?  
(~~se pas nan kesyon 89~~)
1. Avek èd ADS 2 ---
  2. Avek èd you, lòt pwojè ---
  3. Avek mwayen pa ou sèlman. ---
  4. - - - - - ---
89. Eske ou ta renmen konsève tè ou?  
1. wi --- , 2. non ---
90. Si wi, pouki sa? (anpil repons posib; mete 1 pou wi, 2 pou non nan bwat la)
1. Si tè'm yo konsève, se pou mwen l'ap bon ---
  2. Si tè'm konsève, jaden'm ap donnen plis ---
  3. M' renmen lajan ADS 2 bay la ---
  4. - - - - - ---
91. Si non, pouki sa? (anpil repons posib. mete 1 pou wi, 2 pou non nan bwat la)
1. Sa'm wè yo fè pou konsève tè yo pap pè anyen wre ---
  2. Sa pa enterese'm ---
  3. ADS 2 bay twò piti lajan ---
  4. - - - - - ---
92. Eske ou ta renmen konsève tè ou travay ki pa pou ou yo?  
1. wi --- , 2. non ---

93. Si wi, pcu ki sa? (anpil repons posib; mete 1 pou wi, 2 pou non nan bwat la)

- 1. paske tè mòn fèt pou konsève \_\_\_\_\_
- 2. paske m'espere achte yo you jou nan menmèt li \_\_\_\_\_
- 3. paske jaden'm ap donnen plis \_\_\_\_\_
- 4. - - - - - \_\_\_\_\_

94. Si non, pou ki sa? (anpil repons posib; mete 1 pou wi, 2 pou non nan bwat la)

- 1. paske tè a pa pou mwen, m'pap ranj'l pou mèt li \_\_\_\_\_
- 2. kcu tè a konsève mèt li ap wle pran'l nan men'm \_\_\_\_\_
- 3. twèp travay pou'm fè pou mèt tè a \_\_\_\_\_
- 4. - - - - - \_\_\_\_\_

95. Nan bagay sa yo, ki es ou konnen ke ADS 2 fè itilize pou fè konsèvasyon sòl? Eske ou renmen yo? Pou ki rezon?

| <u>Min bagay-yo<br/>youn pa youn</u> | <u>Cu konnen?</u> | <u>Cu renmen'l</u> | <u>Pcu ki rezon'l bon ou<br/>pa bon.</u> |
|--------------------------------------|-------------------|--------------------|--|
|                                      | 1 = wi<br>2 = non | 1 = wi<br>2 = non  |  |
| 1. Kano kontou                       | _____             | _____              | _____                                    |
| 2. Kòdon pye                         | _____             | _____              | _____                                    |
| 3. Mi sèk                            | _____             | _____              | _____                                    |
| 4. Napye                             | _____             | _____              | _____                                    |
| 5. Bwa blan                          | _____             | _____              | _____                                    |
| 6. Bwa ple                           | _____             | _____              | _____                                    |

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- 7. Lacaena .....  | .....  \_\_\_\_\_  
\_\_\_\_\_
- 8. Nim .....  | .....  \_\_\_\_\_  
\_\_\_\_\_
- 9. Sitwon .....  | .....  \_\_\_\_\_  
\_\_\_\_\_
- 10. Zoranj .....  | .....  \_\_\_\_\_  
\_\_\_\_\_
- 11. Kas .....  | .....  \_\_\_\_\_  
\_\_\_\_\_
- 12. Kajcu .....  | .....  \_\_\_\_\_  
\_\_\_\_\_
- 13. Lôt bwa .....  | .....  \_\_\_\_\_  
\_\_\_\_\_