

**Food  
Legume  
Improvement  
and  
Development**

Proceedings  
of a  
workshop  
held at The  
University  
of Aleppo,  
Syria,  
2-7 May  
1978

Geoffrey C.  
Hawtin  
and  
George J.  
Chancellor,  
Editors

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*Editors:* Geoffrey C. Hawtin and George J. Chancellor

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## **Food Legumes in the Farming System: A Case Study from Northern Syria**

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Food legumes are a very significant component of rain-fed cropping systems in northern Syria, occupying up to 25% of the cropped land area. They are commonly grown in rotation with cereals and summer crops and are an important source of food and income for many of the poorer farmers of the area.

In developing a research program with the main objective of improving the productivity and stability of legume crops, it is essential that an approach involving the consideration of the wide range of variables that affect farmers' capacities to influence production and income be adopted in preference to a fragmented approach considering only the legume crops themselves. Through studies of the whole sphere of farm and household activities, an understanding of the range of choices open to farmers and the formation of farming strategies as related to the development of the family may be achieved. The family, however, should not be the only unit of analysis; comparisons must be made between family groups, between agroecological zones, and between major production areas to fully understand the linkages between local and national structures and the farmers' extent of control over resources. Decision-making and problem definition at the village level has appreciable consequences for policymaking at the governmental level. For this reason, an understanding of the relations between production in different areas, which can be achieved through a thorough comprehension of the distribution of resources and income and the utilization of labour, should be considered to be an important part of such an approach.

This type of research approach also finds considerable application in the development of alternative management systems, in rotations, and in the conservation of land resources.

This paper considers the circumstances of two farming families who represent very different groups of producers, in an attempt to illustrate the necessity for this approach to the solution of the problems of farmers in the developing world.

### **Background**

The study outlined in this paper is a small part of the studies currently under way on the farming systems of the Aleppo Province of Syria. These studies are designed to avoid the past mistakes of concentrating exclusively on the development and transfer of high input technologies. Such emphases have often resulted in the provision of benefits to the minority at the expense of the majority of farmers and have led to an increasing dependence of many agricultural systems upon external aid and support. Farming systems research at ICARDA is based upon an awareness that agricultural development involves people and their needs and that an understanding of these interrelations is essential to the evolution of agricultural alternatives that are operable in the real world. In this context it is considered important to take into account the variation in resource availability between and within agroclimatic zones and, in addition, the large variations in command over resources existing between the minority of rich farmers and the majority group of poor farming families.

The initial studies of this program concern investigations into the social, physical, and

biological structure of existing farming systems and detailed analyses of their production processes. This work is based primarily upon surveys of a series of villages located in different ecological zones and exhibiting different forms of agricultural organization.

### **Village Resources and their Use**

The village used for this case study is situated in a high rainfall zone (average annual precipitation is 500 mm) in the north of the province, 70 km from Aleppo and 10 km from Afrin, the district centre. It has a population of 300 people, and all of the 45 permanently resident families own land. Six families, whose members are absent for most of the year, own only trees. The average family size is just over 7 persons, with a range of 1-25.

The total land area around the village is 1070 ha, of which 965 ha are cultivated and 105 ha rangeland. Olive trees occupy about 260 ha. During the land reforms between 1958 and 1963, 310 ha were redistributed to 37 families, and the average holding size is now 10.2 ha (with a range of 2-45 ha); 26 families possess holdings of less than 8 ha. The holdings are usually split between the three main soil types: a deep red cracking clay on the lower slopes, a brown-grey stony loam of about 60 cm in depth on the middle slopes, and a shallow black heavy clay loam on the upper slopes. The average number of plots per holding is four.

A two-course rotation involving wheat, barley, lentils, chick-peas and broad beans as winter and spring crops, and cotton, melons, and sesame as summer crops (following a winter fallow) is commonly practiced on the arable land. However, in recent years the area devoted to lentil production has declined as a consequence of a reduction in the guaranteed price and this has led to a simplification of the rotations. Vines and summer crops are commonly interplanted between young olive trees before they come to bear, but once they become productive the ground beneath them is kept clean.

Thirty-two families own livestock, amounting to 227 sheep and 210 goats; and 12 of these 32 families also own draft animals. There are five tractor owners in the village and they carry out most of the cultivation operations. One combine harvester is present.

The village has a cooperative membership of 40, most of whom receive short-term loans for fertilizer and medium-terms loans for the purchase and establishment of olive trees from the organization. The cotton crop is marketed through the cooperative, but most of the other crops are sold individually on the black market in preference to using the government channels. A primary school is situated in the village but no electricity, telephone, or piped water is available. A new road is at present being constructed to link with the main local highway and should be completed by the winter of 1978-1979.

This information provides the base for the continuing in-depth study of climate, soils and cropping, farm operations, and household income and expenditure over several seasons. A total of eight farming families, covering the range of land/person ratios of village households, were selected as a sample for the further studies and two of these family situations are discussed in this paper. A summary of each family's resources is given in Table 1, and the ways in which the household requirements are generated and the interrelations within the farming systems operated by each family are illustrated in Fig. 1 and 2.

### **Discussion of the Individual Family Circumstances**

The main point of contrast between the two families studied is that the larger landholding and greater number of productive olive trees owned by family A (8 persons) provides a stable and high income for that group; whereas the smaller land area (about average for the village) and number of trees of family B barely provide sufficient income or food to supply the annual needs of the household of 10 persons (Table 2). Consequently, the head of family B is forced to supplement the household income by working as an agricultural labourer for some periods during the year and the family is dependent on a variety of loans to maintain the household.

The cropping system of family A is dominated by olive production, which, as it provides the bulk of family income (Table 2), receives first priority in care and attention. Cereals are the most important field crop, Mexipak wheat being grown as a cash crop and the local variety "Hamari" as the main food grain, which is stored from one season to the next. Lentils and

TABLE 1. Resources and their use for two households from a village in Northern Aleppo Province, Syria.

Resources	Family A	Family B
Family size	8	10
Ages: Males	65, 25, 22, 15, 13, 9	30, 12, 10, 6, 2, 6 months
Females	45, 18	30, 14, 8, 4
Land (ha): Private	33.5	3.0
From land reform	-	6.1
Crops 1977-78 (ha)		
Wheat: Mexipak	4.0	2.0
Hamari	2.0	0
Barley	0.1	0.5
Lentils	0.5	0.6
Chick-peas	6.0	2.2
Broad beans	0	0.05
Olives	8.0	3.0
	(600 trees)	(200 trees)
	7.0	1.0
	(500 not bearing)	(not bearing)
	7.0	
	(500 in another village)	
Livestock		
Sheep	3	0
Goats	8	7
Cattle	1	0
Chickens	16	15
Machinery	Tractor, plough, trailer, cultivator	None
House	Stone-built, 3 rooms, kitchen	Mud brick, 1 room, kitchen
Possessions	3 diesel stoves, 2 pres. lamps, 2 butagaz rings & cylinders, cupboard, sideboard, 2 chairs, table sewing machine, 2 radio recorders	1 diesel stove, 1 primus cooking stove.
Loans	Private	From Agricultural Bank

TABLE 2. Expenditure and income for period November 1977 to August 1978 (Syrian pounds).<sup>a</sup>

	Family A		Family B	
	Expenditure	Income	Expenditure	Income
Cropping	4255	1407	2699 (1538)	4166
Livestock	1170	466 (1400)	573	-
Household	16349	-	2805 (497)	-
Food	2453	-	2741 (651)	-
Machinery	4545	350	-	-
Other	-	-	-	780 <sup>c</sup>
Total to end August 1978	28772	2223	8818	4946
Estimated total annual expenditure and income	33351	45957 <sup>b</sup>	12843	14546 <sup>b</sup>

<sup>a</sup> Syrian pound = ca. U.S. \$0.25 (August 1978).

<sup>b</sup> Including income from olives estimated as 42334 Syrian pounds for family A, and 9600 Syrian pounds for family B.

<sup>c</sup> From agricultural labouring.

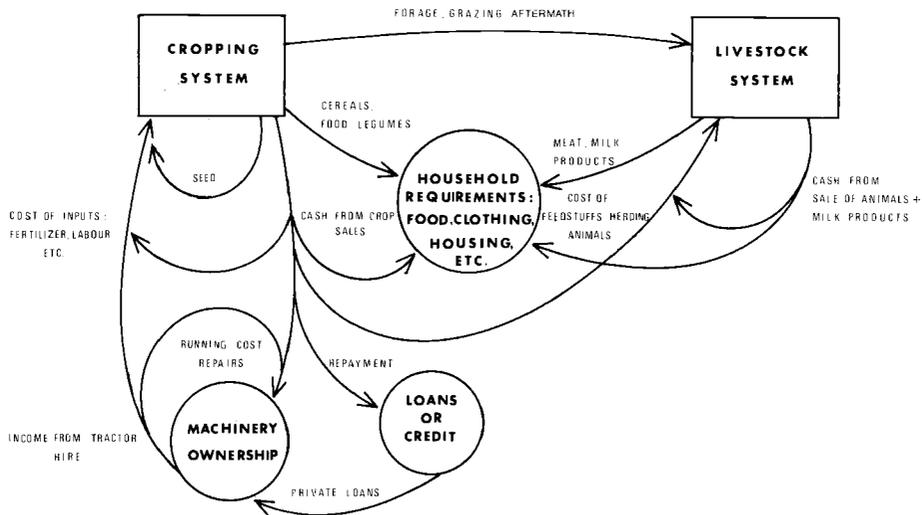


Fig. 1. Ways in which household requirements are generated and the interrelations within farming systems operated by family A.

chick-peas are produced on an area similar to the cereal crops, but are generally regarded as less important by the household and are consequently not as well managed. This may, in part, be due to the reduction in the family female labour force resulting from the marriage of two of their daughters, as tending the legume crop is traditionally regarded as female work. Both legume crops, however, are important sources of food for the household through the year and the surplus over consumption requirements is stored and sold periodically according to seasonal cash needs. Chick-peas are the most important of the two crops, especially as a poor harvest in

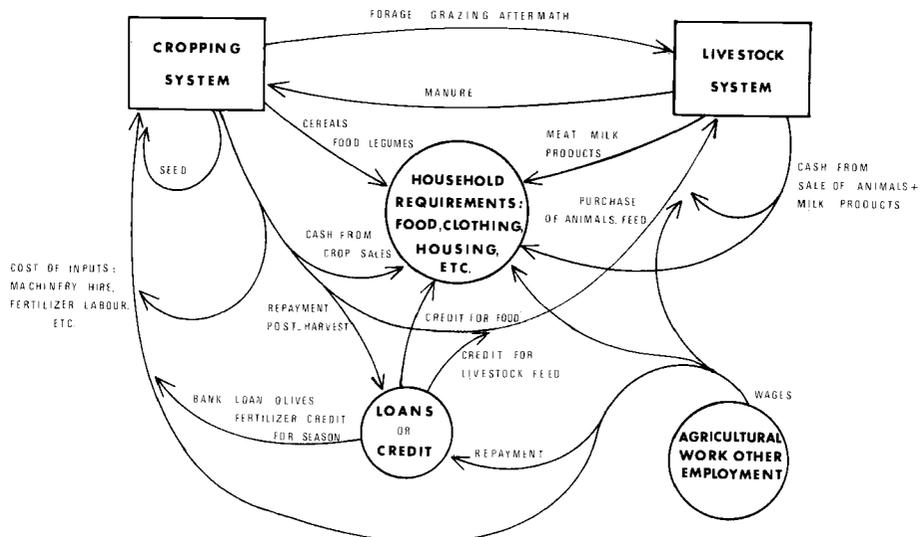


Fig. 2. Ways in which household requirements are generated and the interrelations within farming systems operated by family B.

1976-77 and a drop in market price have caused the family to reduce their lentil area in the current season. A summary of operations, yields, and crop disposal for lentils and chick-peas is given in Table 3.

The machinery owned by family A (Table 1) is used both on the family lands to reduce labour needs and provide transport, and to earn additional income through contracted services to other families. However, repair costs are high and the income from machinery only just covers expenditure.

Livestock have become less important for this family with their reduced animal-managing capacity caused by the departure of two daughters already mentioned. It is appreciated that this reduction in livestock has been followed by a decline in the use of organic manure, a consequent decline in soil organic matter, and an increasing dependence upon inorganic fertilizers.

The family usually pays cash for most goods and receives some short-term credit for machinery repairs (Fig. 1).

Family B, in contrast, has a much greater dependence upon arable crops and, as a result, practice higher standards of general husbandry. There is a much greater interaction between livestock and cropping in this farming system (Fig. 1 and 2). Again, the main field crop is

TABLE 3. Operations, yields, and disposal of grain legumes for two farming families.

Crop	Family A	Family B
<b>Lentils</b>		
Area	0.5 ha	0.6 ha
Ploughing	Mouldboard 3 Sep & 15 Dec	None
Cultivating	15 Dec	1 Jan
Planting	Broadcast by hand 15 Dec 120 kg seed/ha	Broadcast by hand 1 Jan 130 kg seed/ha
Weeding	None	By hand, 1 Apr
Fertilizer	None	50 kg triple super phosphate
Harvest	By hand, 15 May	By hand, 18 May
Yield	250 kg seed + 120 kg straw	260 kg seed + 300 kg straw
Disposal: Sale	None	None
Food	150 - 200 kg	130 kg
Seed	50 - 100 kg	130 kg
<b>Chick-peas</b>		
Area	6.0 ha	2.2 ha
Ploughing	Mouldboard 20 Feb & 2 Mar	Mouldboard 7 Jan & 8 Mar
Cultivating	21 Mar & 23 Mar	-
Planting	Broadcast by hand 22 Mar 120 kg seed/ha	By hand, 8 Mar 136 kg seed/ha
Weeding	None	By hand, 20 May
Fertilizer	None	Organic manure: 2 trailers + 50 kg Knitro (26% N)
Harvest	By hand, 14 Jun	By hand, 15 Jun
Yields	1500 kg grain + 200 kg straw	2500 kg seed + 2 tonnes straw
Disposal: Sale	625 kg (according to cash need)	1875 kg
Food	250 kg	} 625 kg
Seed	625 kg	

wheat, with the variety Mexipak being preferred for its high yield. The family is, however, not self-sufficient in wheat and was buying grain for home consumption from January in the year in question (1978). Legume crops are relatively more important to this family and, although a proportion of the lentil and chick-pea crops are retained for food and seed, the bulk is sold and generates as much income as Mexipak wheat. These crops thus provide an important source of cash at times of need through the season and are consequently well cared for. The lentil crop was grown on land cultivated on the contour and phosphate fertilizer was applied, as was also the case with chick-peas, which received, in addition, organic manure. Both crops are kept weed-free by the children. The 1977-78 chick-pea area was increased in response to an improved price differential with lentils. In addition to lentils and chick-peas, two small plots of broad beans were also grown for family consumption (Tables 1 and 3).

The cash received from crop sales is used for household purchases, the repayment of loans, and the purchase of inputs, including seed. The family uses loans from the Agricultural Bank for olive production and fertilizers and these are repaid at the end of each season. Credit is also received for livestock feed and food and this is usually repaid from the income generated by agricultural labouring (Fig. 2).

## Conclusions

The contrasting circumstances of these two families suggest the value of a consideration of the ways in which the source and possession of resources and levels of income structure the possibilities and choices of different families.

There is scope for the improvement of legume production in both cases. However, this is much less obvious for family B in view of their superior crop management and the lower degree of flexibility existing within their household economy for the allocation of additional resources to legume production. Family A, however, with its higher and more secure income, is in a better position to afford changes in input levels, varieties, or management techniques. In this case, the present income adequately covers the family's needs and the adoption of changes will thus depend upon the family's perception and evaluation of the relative advantage of increased legume yields as against the advantages of investing in other alternatives. The recognition that, in these circumstances, objectives other than the maximization of yield and cash income are more highly regarded indicates that more attention would be given to those families represented by the second case for whom increased yields and income are urgent needs.

Such families find it very difficult to adapt their cultivation methods or increase inputs without the additional cost of these measures increasing their level of debt and dependency. Although the eventual improvement in productivity and income would more than justify the increased costs involved, the difficulty of financing the initial steps, especially if they are presented in terms of a package of practices with no sequential ordering of components, still remains a major stumbling block. However, even small improvements would be of great importance to these families, providing that the starting point is within their present capacity. This finding strongly indicates that research is more appropriately directed toward the development of low-cost stepwise recommendations relevant to most farming families who fall into this category, even if less spectacular results are achieved. High-input, high-cost packages, yielding spectacular improvements, would seem to benefit only a minority of farmers (providing of course that they chose to adopt them) for whom the need is less urgent, and would serve to accentuate the present disparities of wealth that exist in the farming community as a whole.

The circumstances of the poorer families are common both within the study village and the region as a whole. It is this group of farming families who make up most of the farming community in many areas to whom the bulk of farming systems research in the region should be directed. Such a commitment has important consequences for the whole organization of research: in the composition of research teams, in the identification of research priorities, and in the conduct and location of research work.