Adoption of Winter-Sown Chickpea in Syria

Traditionally, in Syria, chickpea is sown in spring. Although this allows the crop to evade conditions favoring the development of ***Ascochyca*** blight, flowering and grain production occur at a time of low rainfall and high temperature. In consequence, yields are low and unstable. Winter-sown varieties, developed for resistance/ tolerance to blight and cold, reach the reproductive stage earlier and, therefore, have much higher yield potential. Over 10 years of trials, winter-sown varieties have consistently out yielded local spring-sown ones. Moreover, partial budgeting, based on records of the variable costs, indicates substantially higher net returns every year from winter chickpeas, despite local and seasonal differences in growth conditions.

Production Trends

Spring-sown chickpea is Syria's second most important food legume after lentil. Over the past 20 years, matching the large increase in the total area planted to rainfed crops, the area under chickpea has increased by an average of about 3% per annum, to around 70 000 ha; but average annual production has increased only by about 1% per annum, to around 40 000 tonnes. A part from annual fluctuations, the trend of per hectare productivity has been downward (Fig. 44).

One anticipated advantage of winter-sown chickpea was that, with earlier planting and more efficient use of moisture, yields would be less subject to rainfall variation. However, a survey of crop statistics has shown that, on a per hectare basis, mean chickpea yields are already less variable than those of other major crops (coefficient of variation 22%, compared with **35%** for lentil and 37% for wheat). Rainfall has a relatively greater impact on the variability of area planted than on actual yield. This is because the later planting time of spring chickpeas allows a planting decision to be made according to rainfall already received and not, like winter-sown crops, on expectations of rainfall. In dry years apparently, some farmers choose not to plant, thereby saving production costs and avoiding the risk of crop failure. The existence of this option for spring but not for winter chickpea has important implications for the adoption of the winter varieties.

Chickpea in the Farming System
Chickpea is largely a rainfed crop, with only about 5% of total production under irrigation. In the past, the main areas of production were in the wetter parts of the northwest and southwest of the country (Fig. 45). Until about 1979, when there was a devastating drought in southern Syria, almost three-quarters of all chickpea planting was in the southwest, and Deraa province (i.e. the Hauran plain) alone accounted for 43% of the national total. But there **have** been shifts in the national production pattern in recent years. The area planted in the southwest has fallen slightly, but between 1971-75 and 1982-87 that in the northwest grew substantially, with a total increase of 74%. Currently, about 37% of the national chickpea area is in the northwest. Interestingly, the Hassakeh province in the northeastern region has now developed into a production area.

Three factors may have been important for the shift away from the southwest. The first is yield performance; average annual yields declined more steeply in the southwest than the national average. The second factor is mechanization. The terrain in the southwest is difficult. Situated amidst ancient lava flows, the land is rough and full of stones. Mechanization of chickpea, land preparation, seeding, and harvesting has not progressed there as fast as in the northwest and, especially, the northeast. So, relative to the southwest, harvesting costs tend to be lower in the northwest and northeast. The third factor may have been the success of a government program to replace fallow with winter crops in the southwest.

Chickpea presents planners and economists with a problem. National production is almost stagnant and varies widely from year to year, for example 64 000 tonnes in 1981 but 11 000 tonnes in 1979. But at the farm level there is no perceived problem. If the farmer is practising the traditional wheat-based farming system, the spring chickpeas act as a desirable buffer against ***the*** risk of economic loss arising from the unreliability of the winter rains. In fact, **being** able to vary the area planted to spring chickpeas from year to year as a protection against loss from crop failure is one of the major benefits the crop gives the farmer. A predictable yield, even if low, **may** be preferred to an unpredictable yield, no matter how potentially high.

Assessment of Potential Adoption of Winter Chickpea
In ***1989/90,*** the Socioeconomic Studies and Training Section of the Syrian Scientific Agricultural Research Center, together with **ICARDA,** conducted a farm-level survey in Aleppo, Hama, and Hassakeh provinces to assess the

performance of winter-sown chickpea under farm conditions. Post-harvest interviews were conducted with two groups of farmers, those growing winter chickpea for the first time and those with at least 1 year's experience. An important question in each case was whether the farmer intended to adopt winter chickpea, i.e., grow it again in 1990/91. Generally, those farmers with longer experience of the crop were more likely to adopt, but in both groups there were large differences between provinces (Table 32). These differences reflected the nature of the *1989/90* growing season. In Aleppo and, more SO in Hama, it was a very dry season, with frosts persisting until late March in some places, whereas in Hassakeh conditions were wet and fairIy mild. **Thus,** yields and financial returns were favorable in Hassakeh but unfavorable or very unfavorable in Aleppo and Hama. In fact, over much of these **two** western provinces, the season was poor for both winter and spring-sown chickpeas.

Though great caution is required in interpreting a single year's data on adoption, the survey provides useful indicators for subsequent actions. The major reasons cited for growing winter chickpea in *1989/90* were expectations of high yield, high net benefit and, in the case of Hassakeh farmers, many of whom have a large **farm** area, the possibility of mechanical harvest.

Asked to compare winter and spring chickpeas, many farmers noted the more vigorous growth and frost tolerance of the winter varieties and the potential for higher and more assured yields; and these points were made even by some farmers who had decided not to continue with winter chickpea in 1990/91. Weather apart, few serious production problems were reported.

Perhaps because of the harsh weather in the northwest, the cost of weed control **was** not rated as serious a problem as could be the case in better seasons. Comparative evaluations of the two winter varieties available showed notable differences (Table 33). Ghab 1 was slightly more favorably rated than Ghab 2, particularly for seed size. Determining the economic threshold for adoption is a difficult exercise, requiring a much larger data set than currently available. Each farmer has unique economic circumstances and expectations, and any patterns and commonalities among groups of farmers will likely vary with location, farm size, land use, etc. The net revenue threshold for adoption in 1989/90 appeared to lie somewhere between 2 500 and 6 **800 SYP** per hectare (SYP **11.2=US$ I),** but this figure would obviously vary from year to year depending on the season and the comparative performance of spring chickpea. For example, in Aleppo, where the net revenue differences between winter and spring chickpea were relatively slight, the adoption rate was markedly lower than in Hassakeh. In addition, net revenues (and **risks)** from winter chickpea need to be compared with those for other crops in the farming system.

Substitutability with spring chickpea is not the only issue in winter chickpea adoption. Because winter sowing requires a land-use decision and allocation of resources early in the season before the rains, it is better understood as a separate crop in terms of management and adoption rather than simply a variation, albeit an improved one, of spring chickpea.

Questions exploring the subject of expanding winter chickpea go beyond the various constraints faced by farmers during the initial adoption year. The most important of them appears to be low selling price. This reinforces the impression given by farmers of their initial reasons for growing winter chickpea and of their adoption decisions following harvest. Economic return will be the key variable influencing the future course of winter chickpea adoption in Syria.

Conclusions

The present chickpea situation in Syria is one of uncertain production from one year to the next.
Although spring planting allows farmers to escape the risk of crop failure due to poor rainfall, it also means they must accept lower production levels and less than optimal land-use intensity. Since economic pressure on land is constantly increasing, the economic benefit farmers can obtain from spring chickpea is arguably in decline relative to other crops in the farming system.

Winter chickpea promises to solve these problems by means of a higher yield potential and more productive use of land. In principle, winter varieties could serve as a mechanism for stabilizing the area planted, allowing planners and farmers alike to allocate resources in a more rational manner than presently possible. However, even if winter sowing stabilizes crop area, there remains the question of whether it will stabilize yields and economic returns. With spring planting, in a dry year a farmer may decide not to plant. He gets no yield, but neither does he lose an investment. With winter planting, there can be no such guarantee. Nonetheless, prerelease experiments and verification trial indicate that the higher yields obtained in most years could outweigh the risk of losing planting investments in very dry years. Whether or not farmers share this logic can be established only by continuing the monitoring of adoption in future years.