Developmental Project for Introducing Saffron (*Crocus sativus* L.) as an Alternative Crop in Other Moroccan Regions

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Abstract

Moroccan saffron is mainly produced in the South, on a limited zone of about 600 ha. In 2005, the National Institute of Agronomic Research, Morocco, carried out a study on trying saffron crop in some underprivileged regions under diverse environments, as way to propose alternative crop for the socio-economic development of rural area. The preliminary results obtained during this first year are promoting.

INTRODUCTION

Saffron crop is practiced in Morocco since a long time. It is said to have been introduced by the Arabs in the Maghreb toward the IXth century. Its production is limited to a small area in the South, in the Atlas Mountain, on about 600 ha. The main region of its implantation is the Taliouine zone (altitude 1200-1630 m, latitude 30°26'N and longitude 8°25'W), a remote area in the Southwest of Morocco with a cold winter and a hot summer. Rainfall ranges annually from 100 to 200 mm, so the farmers irrigate their plots with water pumped from wells. The added amount of water is about 35 to 50 mm per ha per week from September to November. The irrigation interval increases from December to March then stops during the summer period. The average yield varies from 2 to 6 kg/ha during its five to six years of soil occupation, with a maximum reached during the third till the fifth year. Higher yields are achieved on some well-conducted plots (10 to 15 kg/ha). Saffron in Morocco is carried out traditionally without recourse to chemicals. It is sowed and harvested during the autumn (ORMAO. 2000). The major saffron production is marketed at national level. An overview on the technical aspects of saffron cultivation, harvesting and marketing in Morocco are reported by Ait Oubahou and El Otmani (1999).

We advance the idea of growing saffron in some other deprived Moroccan regions, as a way to propose substitute crops for the socio-economic development of rural areas. Saffron can be used as an alternative crop for the diversification of agricultural production as a way to improve the quality of farmer life by its high benefit, especially for women farmers who are the most present in picking up flowers. It could also ensure the sustainable use and conservation of the area since it is a perennial culture. The first step for achieving this purpose is to try saffron under different environments and to study the influence of the milieu on the flowering capacity of saffron in the zone of introduction, and afterwards, on the quality.

MATERIALS AND METHODS

Prior survey work was done on September 2005, in the southern region of Morocco where saffron crop grows (Taliouine region) regarding cultural techniques used by farmers, yields and problems encountered with this crop (low yield, commercialisation problems and so on). A collecting work was carried out in order to gather seeds in fields and growers’ reserves. In addition, further information on cultural techniques used in the region was registered from local specialists and through many interviews with farmers.

Eight sites with different environments (soil, climate and altitude) were chosen, to
grow up saffron. The study was conducted in experimental sites, at the level the National Institute of Agronomic Research (INRA) and at the level of farmers. The sowing area was of about 100 m² in each site. It is sown on 2 x 3m raised beds with rows 20 cm distant. Sets of two to three corms are planted at a distance of 10 cm within rows. The planting depth is about 15 cm. Sowing density was about 3.5 t/ha of corms. About 30–40 t/ha of farm manure were applied during the ploughing. Afterward, manure is brought at a rate of 20 to 30 t/ha after the crop establishment. Planting was done during the first decade of October. Weeds were controlled by hand.

Saffron quality is dependent on its colouring power (crocin concentration), odour (safranal) and taste (picrocrocin). Collected samples of dried saffron from different tested sites were analysed at the USDA laboratory for quality analysis, University of Mississipi, USA using the same method as described by Bolhasani et al. (2005) to quantify saffron components in each sample.

RESULTS AND DISCUSSION

Saffron yielded under different chosen environments (Fig. 1). The harvest period was during November 2005, between 25 and 35 days from sowing. The stigmas collected were placed in shade in a warm and dried room for about 10 days to dry. The dried saffron obtained was analysed for quality. The results obtained during this first year relative to saffron flowering capacity under different environments, are promising. The yield obtained is low as saffron did not give a high yield during this first year of plantation because of the low quality of seeds used.

The preliminary results showed that the quality of saffron obtained in different region tested in comparison with the control from Taliouin region varies greatly (Fig. 2). For the three components tested, the quality of saffron obtained in Merchouch (Alt. 398 m, Lat. 33°43') with an average temperature of 14 (Fig. 2) is higher than the other zones and it is nearly equal to the control from Taliouin. This site was characterised by an average temperature during the flowering period of about 14°C and a clay soil. But those results have to be confirmed by the results of quality analysis during the second and the third year of plantation as to characterise the impact of the environment on the quality.

The results obtained in this first year of assay are promising. We cannot conclude on the basis of those results as they have to be validated on the future results of the quality during the next years of saffron establishment. In order to spread the saffron culture in different Moroccan regions and to guarantee its future, it is necessary to improve cultural techniques and selected plant material as well as to increase both yield and quality, and to try to extend the uses of saffron. Also, since farmers have small area to grow up crops, they cannot stand to grow up saffron solely, so it is very important to try growing up other crops (medicinal plants, legumes or forages) in association with saffron as to occupy soil during the spring and the summer period and then to ensure double production of the same area.

Literature Cited


Fig. 1. Sowing and harvesting dates of saffron in the chosen sites.
Fig. 2. Quality of saffron obtained in different tested zones as compared to the control zone (A) (Data are reported as normalized amount relative to the control zone). A: Taliouine; B: Oulmes; C: Rabat (site 1); D: Rabat (site 2); E: Settat; F: Larache; G: Tadla; H: Merchouch.