

IENICA

Interactive European Network for Industrial Crops and their Applications

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REPORT FROM THE STATE OF ITALY

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CONTENTS

Executive Summary	3
Introduction	4
Oil Crops	5
Fibre Crops	6
Carbohydrate Crops	6
Speciality Crops	7

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METHODOLOGY

The report is based on information from public and private operators of agricultural, industrial and commercial sectors, mainly contacting farmers' associations, agricultural experts and farmers. Also contacted have been industries in agricultural-related sectors and specific commercial operators. Official statistics and the agricultural-press have been reviewed. Lots of information has been captured while participating in discussion events, symposiums and meetings focusing on the problems of the non-food sector.

EXECUTIVE SUMMARY

In Italy in the last three years there were no developments of significance within the non-food production chains. We have seen instead a decrease in the surface area cultivated with oilseed crops cultivated for non-food destinations. There is still interest and availability from the agricultural world towards alternative crops or towards non-food destinations of traditional crops. Many industrial sectors have continued to be interested in developing agro-industrial production chains. The agricultural and industrial sectors remain, however, separate and do not have knowledge of what one offers and the other requests.

Research activities have produced some interesting results and most recently interesting initiatives of development, promoted by public and private entities, have begun to be established.

INTRODUCTION

For all the non-food crops in Italy the same general considerations can be made. Currently there is a great interest in the agricultural world, both at the level of agricultural associations and individual farmers, for the cultivation of novel crops. The interest is directed towards new crops (such as crambe, *B. carinata*, kenaf, etc.), and towards old crops which vanished from cultivation but are now beginning to be reintroduced (e.g. hemp).

We look with interest also at the non-food destinations of crops usually cultivated for human and animal foods (such as maize or wheat cultivated for starch, or oilseed rape and sunflower cultivated for the oil industry). A more limited interest is centred around niche cultivations, such as those for colourants, cosmetics, pharmaceuticals etc.

The interest of the agriculture world finds the industrial world available, but without the two sectors having a chance to meet to give life to the production chains. In the rare moments of meeting there seems to be a dialogue among the deaf, without any of the participants being really interested to know what the other offers or asks. This general situation has already been going for a few years.

In recent years the interest seems instead strongly orientated towards energy cultures with the involvement of industrial groups that seem interested in relevant economic investments in this sector. For all the non-food crops, and in particular for energy crops, the interest of regional administration in these crops is awakening.

In summary therefore, for all the non-food crops, we have not had progress worth noting in the last years, except for two limited initiatives, one regarding hemp and the other regarding Crambe. The analysis of single sectors can only be extremely brief.

OIL CROPS

The traditional oil crops (oilseed rape, sunflower and soybean) have been subjected in the last three years to a strong decrease in the area of cultivation and production (Table 1). Italian statistics do not differentiate food from non-food destinations for these crops. It can be said, however, that rape has been cultivated mainly for non-food destinations (mainly biodiesel), while sunflower and soybean oils were directed at food destinations. The strong decrease of the surface area cultivated is linked to the changes in EU policy. In reality, the subsidies do not compensate for the inferior price given for non-food destinations. Therefore, the agricultural farm does not have any economic convenience to produce in the non-food sector and thus does not take this possibility into consideration.

In addition we must point out the great interest that an industry interested in oils with a high erucic content has developed around *Crambe abyssinica* in recent years. The oil is destined for the production of lubricants. In 2003 experimental cultivation was initiated on a few hundred hectares of which the level of production is still not known, but regardless will not be satisfactory because of the extreme drought and high temperatures registered during the summer.

Another crop that seems to be becoming of interest is *Brassica carinata* which has an acceptable production level and acidic composition of the oil, characterised by a high content of erucic acid. Added to this there is a good level of glucosinolates in the flour. *B. carinata* is grown on only ten hectares at the demonstration level; 1-1.5 t ha⁻¹ of oil.

Table 1 – Oilseed Crops (Italy)

	2001	2002	2003	Mean	Trend (%)
Rapeseed					
Area (ha)	30,485	9,842	4,279	14,868	-86.0
Production (t 10 ³)	31.6	13.6	7.2	17.5	-77.2
Yield (t ha ⁻¹)	1.0	1.4	1.7	1.4	-
Sunflower					
Area (ha)	207,824	167,108	152,385	175,772	-26.7
Production (t 10 ³)	411.4	350.6	254.2	338.7	-38.2
Yield (t ha ⁻¹)	2.0	2.1	1.7	1.9	-
Soybean					
Area (ha)	234,841	152,045	151,814	179,567	-35.4
Production (t 10 ³)	888.4	566.1	566.5	673.7	-36.4
Yield (t ha ⁻¹)	3.8	3.7	3.7	3.7	-

FIBRE CROPS

The fibre crop of interest in Italy is hemp for textile applications, which in 2003 was grown on 900 hectares (296 hectares in 2002). The crop has been grown using techniques and harvesting machines and production lines normally used for flax (no flax is grown in Italy; flax harvesting machines are imported and adapted for hemp). Early varieties were chosen which are harvested while still immature, at a height of 90-100 cm; stopping their growth with chemical treatments. Only low yields are possible with that technique, which can only be compensated for by the added value of the subsequent production phases.

In fact the production chain is organised in a consortium which is formed by primary producers, primary processors, and other actors up to a large industry that produce high fashion apparel. In December 2003 a primary processing factory has been inaugurated. The 900 hectares of hemp grown in 2003 was grown for this consortium (plus about 5ha in the frame of the Hemp-Sys Project).

Other destinations for the production of fibre crops are panels and wood chips. The area of kenaf or hemp is approaching some tens of hectares (20-50 hectares for panels, from hemp (30%) and kenaf (70%)) and the product comes worked from one sole industry in the North.

From a working situation that was disappointing, private industries have recently participated in research activities aimed at single phases of the textile production chain. The administrations of some Italian regions have financed projects for the development of fibre crops and others are foreseen for 2004.

There is some experimental development of nettle (*Urtica dioica*).

STARCH CROPS

The practical situation of this sector is static in the last three years without changes worth mentioning. The business leader of the sector (Novamont) anyway continues to increase the working capacity and above all to consolidate the leadership for material based on starch increasing the number of patents, the extension of the same to different countries and the capacity to work. Starch is mostly extracted from commercial maize; a small amount is from wheat.

SPECIALITY CROPS

In the last years we are seeing a strong increase of isolated initiatives that regard different destinations of minor use. Small private industries that are interested in the results of research participate and promote programmes with specific objectives. The more lively sectors are those of colourants, biocides, and plants able to produce compounds with diverse biological activities. In any case production and demand regard only very limited quantities, difficult to quantify. In particular different initiatives are signalled by agricultural farms that grow plants for colourants. They extract directly the active compound and sell them to small textiles industries, or industries from the food or pharmaceutical sectors. For colourants, a few hectares (6-7) are grown. These are *Isatis tinctoria* (in Tuscany), *Chartamus tinctorius*, *Reseda luteola*, *Rubia tinctoria* (in Central Italy especially in Marche region).

The sector of biocide plants seems very promising. Some societies have a real interest in them and are preparing themselves to produce antiparasitic products based on glucosinolates derived from Brassicas. In this regard researchers are in their final phase; results have been patented and will be exploited in the next years. For biocides, cruciferous crops (mostly radish and mustard) were grown for soil disinfestation from nematodes (sugar beet, vegetables) on about 7000 hectares in 2002 and on about 5000 in 2003 (unfavourable weather conditions).

Regarding plants containing biologically active compounds, work has been done at the level of research in collaboration with the pharmaceutical and cosmetic industrial sector. Genotypes with different content of compounds with antioxidant, antimutagenic, antimicrobial, antifungal properties are being tested. Growing techniques to increase the content of these active compounds are being studied.

10-20 hectares of linseed is grown, especially for pharmaceutical uses.