Can we cultivate erucic acid in Southern Europe?

S. Bona, G. Mosca, F. Zanetti, T. Vamerali
Dep. of Environmental Agronomy and Vegetable Productions, University of Padova – Italy

Over the last fifteen years, considerable progress has been made in the field of "green chemistry", as regards both research aspects and market development. The exploitation of new raw materials from plants is one effect of this current business trend. In particular, extraction of erucic acid (22:1) from plants and its industrial applications have received increasing attention. At present, the known species producing oils yielding large quantities of erucic acid belong, with few exceptions, to the family *Brassicaceae*. Among these, the two major sources of erucic acid in the world are HEAR (High Erucic Acid Rapeseed) and *Crambe abyssinica*, both mainly cultivated in the USA. Their cultivation has also recently been extended to southern Europe, supported by specific research projects. Erucic acid has only no-food interest, as it is mainly used in the plastic film industry as a slip agent for polyethylene and polypropylene, but also in the production of detergents.

The quantity of erucic acid in *Brassicaceae* oils ranges greatly, from 55% in *Crambe abyssinica* to nearly zero in some varieties of *Brassica napus* var. *oleifera*. Even more differentiated and peculiar to each species and variety is its adaptability to specific climatic and soil conditions. In this regard, the major limitation to the cultivation of some interesting *Brassicaceae* species is their poor tolerance to cold. For instance, there is evidence that HEAR and *Crambe Abyssinica* are both adapted to the climate of Italy, but that the latter is more sensitive to low temperature so that, in central and northern Italy, its cultivation is recommended for spring sowing.

Among *Brassicaceae* producing erucic acid, the less frequently cultivated species, such as *Brassica juncea*, *Brassica carinata* and *Brassica nigra,* if grown in areas with relatively mild winters, may give yields of seed and oil similar to those of the most productive rapeseed genotypes.
Within this framework, in order to achieve high production of erucic acid, it is essential to identify the most productive (seed and oil) varieties among available species for each environment. In this report, the results of field tests on the adaptability and productivity of various *Brassicaceae* species and genotypes, carried out over a period of 15 years in northern Italy, are presented in relation to the possibility of autumn or spring sowing.