

OROBANQUE IN SUNFLOWER IN SPAINOrobanchae Cernua Loelf (O. Cumana Wallr)

Orobanque is an obligate parasite which attacks sunflower (confectionery and oil crops) among others.

The germination of the seed is stimulated by the root of the sunflower; it joins with the root and later the plant develops and emerges from the soil and flowers. It absorbs water and nutrients from the host plant, a process which weakens the plant.

The seed is very small. Each plant can produce up to 50,000 seeds that can remain viable in the soil for up to 15 or 20 years. The seed is spread by the wind, agricultural machinery, etc.

Orobanque was first observed in Spain in 1958 on confectionery sunflower in the Central Area; from there it spread to the south. In 1982 the first attacks on oil crops were noted.

1<sup>o</sup>) The damage to sunflower can affect up to 100% of the yield. In very susceptible material, the plant may wither before blooming.

2<sup>o</sup>) The conditions necessary for attack are not very well known. There is different intensity from year to year.

• Early or very late sowing dates decrease the intensity of the attack. In rainy years attacks are lower, and the stress on the plant decreases. In irrigated crops this parasite is not usually present.

3<sup>o</sup>) We consider that the total affected area in Spain is about 200,000 hectares (Appendix 1). In the central zone, the affected area is more or less stable.

In the South, the area is clearly in expansion. At present we do not know what may be the limits of this expansion, nor the bioclimatic mechanisms to halt this expansion.

4<sup>o</sup>) To know the different races is a difficult and complex theme.

From a simplistic point of view, we can speak of a minimum of three races. The first race, which attacked the confectionery sunflower, a second which affected the oil crops at the beginning of the 1980's, and the third which appeared three or four years ago, and which meant that some pure lines which had been considered resistant then became susceptible. The second race had a virulence of 5% (number of lines or hybrids which were susceptible) while the virulence of the third race is 60%.

Using the differentiating lines of Dr. Vranceanu (Appendix 2) we have results which are not very clear, perhaps because the infection was not very strong, perhaps because the purity of the tester line was not very good.

In general, there is a very clear susceptibility in AD-66, KRUGLIK A-41 and RECORD. In other cases we can include S-1358 as susceptible. We have to confirm this point and also determine the distribution of the different races in different zones.

- 5<sup>o</sup>) Resistance inheritance is usually complex and intermedial in the majority of the material. There are some lines with a clear, simple and dominant inheritance.
- 6<sup>o</sup>) Achieving resistance to orobanque has become a primary objective in our breeding programme. All the pure lines and hybrids are tested every year in the observation nurseries in the South and Central Area to select exclusively resistant material.
- 7<sup>o</sup>) During the two years process of registration of hybrids the INSYPV (National Institute of Seeds and Nursery Plants) test for this parasite in a minimum of two locations. Over 10% of attack on one of the repetitions is enough to discard whatever hybrid.
- 8<sup>o</sup>) We still believe that genetic resistance is enough to be able to resolve this problem.

It will be necessary to find new resistant genes, especially in wild species (*H. Tuberosus*, *H. Mollis*, *H. Giganteus*, *H. Multiflorus*, *H. Divaricatus*, *H. Rigidus*, etc.).

At present we have the latest system of control of the orobanque parasite, using herbicides, especially the new families of imidazolinonas (imazetapir e imazapir).

The biological control of orobanque by means of insects (phytomiza) and fungus (fusarium) is still not manageable.

