Aćimović, Yugoslavia

SOME IMPORTANT SUNFLOWER DISEASES IN IRAN

In June, July and August 1971 and 1972 inspection of sunflower diseases was carried out in sunflower experimental and production plots in different regions of Iran.

The main objective was to determine important diseases, their distribution and the rates of infection in different regions, and to outline measures necessary for successful crop production and expansion of acreages under sunflower.

Methods

During inspection diseases were determined in the field, the severity of infection was evaluated and samples were taken for further laboratory determination of the pathogen at the Oil Crop Institute in Karadj. The following diseases and pathogens were identified during the studies. Leaf spot, stalk and head spot, caused by Alternaria sp. (A. leucanthemi = A. helianthi). Wilt caused by Sclerotium bataticola Taub. and Fusarium sp.; dry rot of the head (Rhizopus sp.), downy mildew (Plasmopara halstedii /Farl. et Tony/), rust (Puccinia helianthi Schw.) and white rot (Sclerotinia libertiana Fuck.).

The rate of infection was evaluated by the following scale: 0 = intact plants, 1 = very weak infection (1-20%), 2 = weak infection (21-40%), 3 = mean infection (41-60%), 4 = strong infection (61-80%), 5 = severe infection (81-100%). Such evaluation was carried out twice: at flowering stage and during the ripening of the seeds.

Results of Infection Rate Evaluations

Results of observations on the main diseases

in most important sunflower growing regions located near large towns are briefly given in the present paper.

Teheran. Detailed inspection was carried out in Karadj and Varamin district. These localities situated 50 km from Teheran possess experimental and production plots under different sunflower varieties and hybrids.

Over 10 experimental plots and production fields of the Institute for Oil Crops are situated in Karadj where local and foreign sunflower varieties and hybrids are grown; there are also experimental fields for agronomic practices testing. Much less experimental fields are situated in Varamin. The following sunflower diseases were identified in these regions: leaf spot (Alternaria sp.) at weak or mean rate of infection; dry rot of heads (Rhizopus sp.) and wilt (Sclerotium bataticola) in a weak form of infection.

Rusht. This region is situated in the most humid zone of Iran. The following diseases were observed in all sunflower fields: leaf spot (Alternaria sp.), wilt (Sclerotium bataticola) and head rot (Rhizopus sp.). Rates of infection were from weak to strong. Sometimes white rot of heads (Sclerotinia libertiana) was observed.

Sari-Dashtenaz. The following diseases were observed in this region of sunflower production: leaf spot, stalk spot and head spot (Alternaria sp.), rust (Puccinia helianthi), head rot (Rhizopus sp.), wilt (Sclerotium bataticola). The most severe infection was caused by two fungi: Alternaria sp. and Sclerotium bataticola. They considerably reduced the yield (10-30%) and the quality of grain. Dry rot of heads is also observed in this region but losses due to this disease were not over 5%. Puccinia helianthi was observed only in some experimental plots in a weak form.

Gorgan. The following diseases were observed in this region: leaf spot (Alternaria sp.), downy mildew (Plasmopara halstedii), dry rot of heads (Rhizopus sp.) and wilt (Sclerotium bataticola).

Alternaria sp. and Sclerotium bataticola were registered in all experimental plots and production fields in a strong form of infection. These diseases prematurely interrupted the vegetation of sunflower and reduced the yield to 20%.

Gonbad-Eh-Kavus. In the plains the following diseases were predominant: Alternaria sp., Sclerotium bataticola and Rhizopus sp. Rates of infection were medium. In the hills only Alternaria sp. was observed causing leaf spot in a weak form of infection. Rust (Puccinia helianthi) was seldom observed in a very weak form of infection.

Pars-Abad (Moghan). Three diseases were predominant in this region: leaf spot (Alternaria sp.), wilt (S. bataticola) and head rot (Rhizopus sp.). Rust pathogen (Puccinia helianthi) weakly affected sunflower in some fields. Leaf spot and wilt significantly reduced the yields - to 20%.

Hamedan. Leaf spot (Alternaria sp.), head rot (Rhizopus sp.) and wilt (S. bataticola) were observed in this region. Diseases were present at weak forms and did not reduce yields.

Kermanshah. At the vicinity of Kermanshah the following diseases were present: leaf spot (Alternaria sp.), head rot (Rhizopus sp.) and wilt (S. bataticola). Leaf spot more severely affected plant than in the previous region. Head rot and wilt were present in weak forms.

Songhor. The most dangerous disease in this region proved to be leaf spot (Alternaria sp.), while diseases caused by S. bataticola and Rhizopus sp. were unsignificant.

Rezaya. In rather strong form leaf spot (Alternaria sp.) was observed as well as wilt. Dry rot of head (Rhizopus sp.), Sclerotinia libertiana and downy mildew (P. halstedii) were unsignificant.

Koy. This region is characterized by two forms of cultivated sunflower: oil bearing sunflower and sunflower for edible uses. Varieties of the latter are of Iran origin, and varieties of the oil bearing sunflower are of USSR and Romanian origin (VNIIMK, Peredovik and Rekord).

The following diseases were observed on edible varieties: leaf spot (Alternaria sp.), rust (Puccinia helianthi), downy mildew (Plasmopara halstedii) and white rot of heads (Sclerotinia libertiana); the oil bearing varieties were affected by leaf spot (Alternaria sp.), downy mildew (Plasmopara halstedii), head rot (Alternaria sp.) and wilt (S. bataticola).

Only leaf spot infected the edible varieties in a main degree, while rust, downy mildew and white rot severely affected the plants. The yield was reduced to 50%. Some experimental plots were registered with the number of plants affected by Plasmopara halstedii amounting to 20%. The rate of infection by Sclerotinia libertiana ranged from 5 to 30% of all infected plants. The fungus Puccinia helianthi caused almost 100% infection by uredo pustules. Oil bearing varieties were weakly affected by these diseases and did not significantly reduce the yields.

Isphahan. Leaf spot (Alternaria sp.) and wilt (Sclerotium bataticola) were registered in weak form in the vicinity of this town.

Sheeraz. Sunflower was weakly affected by leaf spot (Alternaria sp.) head rot (Alternaria sp. and Rhizopus sp.) and wilt (Sclerotium bataticola) in this region.

Darab. The following diseases were observed in this region: leaf spot (Alternaria sp.), head rot (Rhizopus sp. and Alternaria sp.), and wilt (Sclerotinia bataticola and Fusarium sp.). Leaf spot and wilt showed medium rate of infection and head rot showed a weak form of infection.

Ahvaz. Studies in experimental plots and production fields revealed leaf spot (Alternaria sp.) and wilt (Sclerotium bataticola). The rate of infection was medium.

Conclusion

The data obtained prompt the following conclusions.

1. All regions of sunflower production in Iran showed two major diseases: leaf spot and wilt. In majority of locations these diseases considerably reduced the yields, especially in the regions of intensive cultivation of the crop, that is in Caspian Sea zone. Leaf spot, stalk and head spot were caused exclusively by Alternaria sp. (A. leucanthemi = A. helianthi). The main pathogen of wilt was represented by Sclerotium bataticola Taub., which was observed in all 15 sunflower growing regions in Iran. Sporadically in some localities, as in Darab, the pathogen of wilt was represented by Fusarium sp.

2. In majority of sunflower growing regions head rot was observed, except the vicinity of Ahvaz. The predominant pathogen was Rhizopus sp., and in some localities Alternaria sp. The disease was especially damaging in humid districts, near Iraq boarder and Caspian coast.

3. Other diseases: downy mildew (Plasmopara halstedii Farl /Berl et Toni/), rust (Puccinia helianthi Schw.), white rot (Sclerotinia libertiana Fuckel) are widespread in humid regions of sunflower production. For example, downy mildew (Plasmopara halstedii Farl [Berl et Toni]) was observed in the vicinity of Rezaye, Koy, Sari-Dashtenaz and Gorgan. Quantities of affected plants ranged from 1 to 20%. Rust (Puccinia helianthi Schw.) identified on oil bearing varieties only slightly affected the plants, but it caused severe damage in edible varieties.

White rot (Sclerotinia libertiana Fuckel) was seldom observed in the vicinity of Rusht and Rezaye, and rather largely observed near Koy where the number of affected plants of edible varieties amounted to 30%.