

SEED-BORNE DISEASES ON SUNFLOWERS

E. E. Leppik, Plant Pathologist
Regional Plant Introduction Station
Ames, Iowa

Because of the steadily increasing demand of sunflower oil as a rich source of polyunsaturated fatty acids for human consumption, repeated attempts are now being made for the commercial production of sunflowers in various countries (Kinman, 1963). As a consequence of increased seed trade, some seed-borne pathogens began to invade new areas. There is, therefore, an urgent need to gather basic information on the current distribution of these diseases so that effective measures can be taken to prevent their further spread (Leppik, 1962).

Seed-Borne Diseases on Sunflowers

Large-seeded achenes (seed proper with the pericarp around it) of sunflowers are frequently carriers of systemic pathogens that are distributed by seed. Downy mildew, Plasmopara halstedii (Farl.) Berl. & D. T., stem and head rot, Sclerotinia sclerotiorum (lib.) De By., Alternaria leaf spot, several viruses and occasionally also rust, Puccinia helianthi Schwein. are spreading by seed to new areas (Noble, Tempe and Neergaard, 1958).

Detection of Foreign Seed-Borne Pathogens
on Introduced Sunflowers

Since all reliable symptoms of seed-borne diseases appear on growing plants, it is almost impossible to detect and intercept seed-borne pathogens during the inspection of imported seed at the port of entry quarantine stations. It is, therefore, necessary to keep all sunflower plants grown under constant phytopathological surveillance for the first two growing seasons.

For detection and interception of foreign seed-borne pathogens a special screening project is carried on since 1961 in the North Central Regional Plant Introduction Station, Ames, Iowa. Before this time the work was done by the Oilseed and Industrial Crops Research Branch. During this time following amounts of sunflower accessions were tested in the field and in greenhouse:

<u>Year</u>	<u>Number of entries tested</u>	<u>Number of introductions found infected by foreign pathogens</u>
1961	160	23
1962	150	12
1963	70	None

Production of Disease-Free Seed
Out of Infected Material

In addition to pathological screening, systematic attempts were made to produce disease-free seed out of infected material. For this purpose a

special technique was elaborated to test large amounts of seed samples introduced from foreign countries.

This new technique enabled us to clean out all known foreign pathogens from the sunflower accessions stored in Ames. The number of diseased accessions was reduced every year until there was not a single case noticed anymore in the summer of 1963.

As a result of this persistent work, the Regional Plant Introduction Station in Ames can now offer increased sibbed seed from 200 introduced accessions of sunflowers, free of known foreign diseases.

Literature Cited

- Kinman, M. L. 1963-64. Several reports in the mimeographed publications of the Oilseed and Industrial Crops Research Branch, College Station, Texas.
- Leppik, E. E. 1962. Distribution of downy mildew and some other seed-borne pathogens on sunflowers. FAO Plant Prot. Bull. 10:126-129.
- Noble, M., f. de Tempe, and P. Neergaard. 1958. An annotated list of seed-borne diseases. Commonwealth Mycological Institute, Kerr, England, 159 pp.

* * * * *

Propositions made by E. E. Leppik - 6/18/64

1. That the importation and introduction of sunflower seed from foreign countries to the United States must be provided with Plant Quarantine Certificate. This certificate must show the origin of the imported seed and a declaration of a professional plant pathologist that the seed is derived from plants free of seedborne pathogens as indicated.
2. All imported sunflower seed must be kept the first 2 seasons in a particular Plant Introduction Station or kept 2 seasons under surveillance of a plant pathologist.
3. That the International Food and Agriculture Organization, Plant Production and Protection Division prepare the international regulations for the sunflower seed trade that would prevent the distribution of seedborne pathogens from country to country.

To name a committee who would prepare and appropriately word a resolution for presentation to proper authorities.

This proposition was discussed, but no action was taken.