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Sunflower Disease Profiles I: Foliar Diseases

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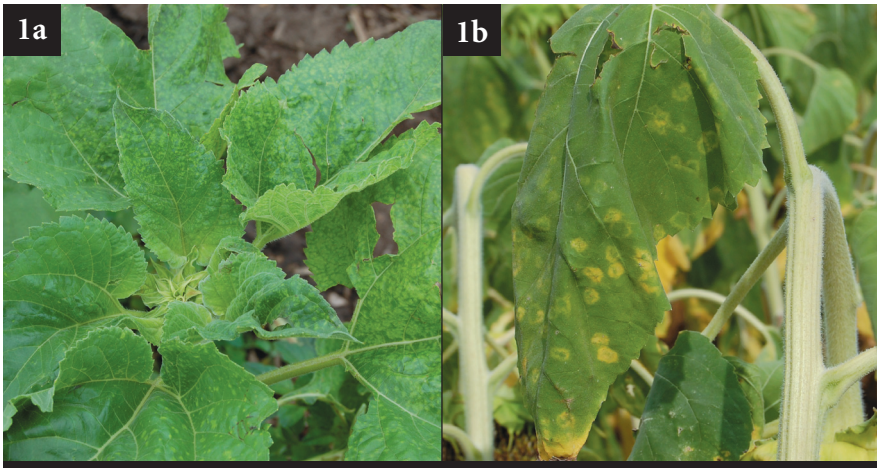
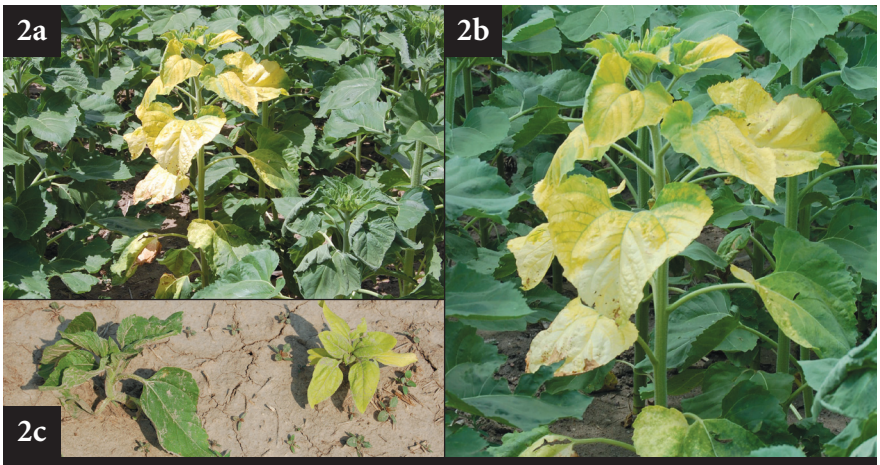


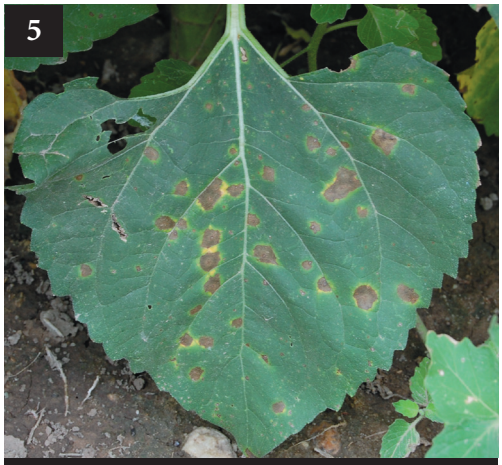
1. Virus Diseases



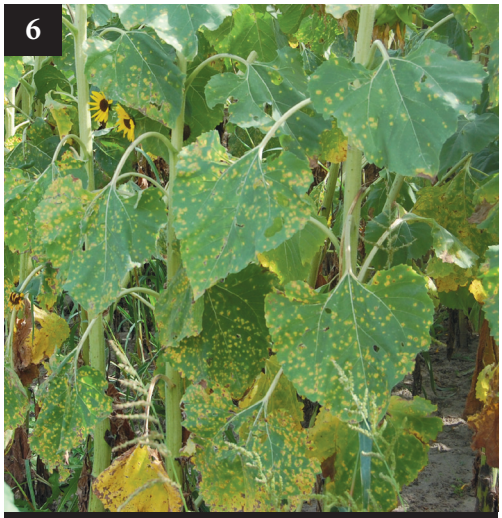
2. Apical Chlorosis

3. Downy Mildew

4. Rust



5. Alternaria Leaf Spot



6. Bacterial Leaf Spot

Disease		Symptoms
1.	**Viruses**	Virus diseases are rarely observed in either wild or cultivated sunflowers. Only one disease (sunflower mosaic) has been formally characterized in North America within in the last two decades. Symptoms suggestive of a virus disease consisting of a yellow mottle (*Figure 1a*) followed by the formation of yellow ringspots (*Figure 1b*) were observed in Nebraska in 2010 and 2011.
2.	**Apical Chlorosis** *Psuedomonas syringae* pv. *tagetis*	Apical chlorosis is a condition that causes a spectacular extreme chlorosis of the youngest leaves. It is observed in all stages of growth (*Figures 2a* and *2c*), but is most common on seedlings or younger plants (*Figure 2b*).
3.	**Downy Mildew** *Plasmopora halstedii*	The pathogen is soilborne and infections can begin in the roots of young plants, resulting in severe stunting (*Figure 3*). Systemic infections are characterized by chlorotic plants with puckered leaves. The chlorosis may be limited to areas bordering veins (inset), or may cover the entire leaf. The chlorosis on the upper leaf surface is indicative of the extent of infection with a corresponding white layer of conidiophores and sporangia (spores) on the lower leaf surface (inset).
4.	**Rust** *Puccinia helianthi*	Symptoms of sunflower rust consist of small pustules that occur on both the upper and lower leaf surfaces. The pustule color will vary depending on the spore stage involved. Early spores stages include circular, orange lesions called pycnia (*Figure 4a*) and the orange cup-shaped aecial lesions (*Figure 4b*). The uredial stage consists of the summer repeating spores (urediniospores) which are reddish-brown in color. It is followed by the overwintering telial stage that consists of black-colored teliospores (*Figure 4c*).
5.	**Alternaria Leaf Spot** *Alernaria* spp.	Leaf spots from Alternaria are roughly circular with grayish-brown centers, often with accompanying yellow haloes around lesions (*Figure 5*). Infections on stems and petioles appear first as brown streaks that may enlarge to form large blackened lesions.
6.	**Bacterial Leaf Spot** *Psuedomonas syringae* pv. *helianthi*	Infections begin as small angular to circular necrotic lesions that often are surrounded by a yellow halo (*Figure 6*). In severe cases the lesions coalesce and may cause death of large areas of the leaf resulting in defoliation.