FUSARIUM FUNGUS ASSOCIATED WITH SILVERTOP DISEASE OF BLUEGRASS, *POA PRATENSIS*, IN NORTHERN MINNESOTA

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Farmers engaged in cultivation of bluegrass seed in Northern Minnesota have been plagued with silvertop of the grass seed heads. This disease is characterized by death of the central stem and its premature drying to a silver-white color. No seed is produced on such stems. Silvertop does not occur in an even distribution in a field. Here and there, in areas of about an acre, throughout the fields very high mortality of the grass was observed. In an entire field, however, the loss was found by sample counts to average about 10 per cent. Farmers have reported a reduction of seed yield as high as 90 per cent loss in years when silvertop reached epidemic proportions.

Hodgkiss (1908) stated that a mite in conjunction with *Fusarium poae* caused silvertop in bluegrass. This was disputed by Hardison et al. (1957) who incriminated thrips as the major cause of silvertop. Holmes et al. (1961) in Alberta generally confirmed the statements made by Hodgkiss (1908) but found that a different species of mite was often responsible. They believed that thrips were of minor importance.

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SILVERTOP IN MINNESOTA

The present study revealed that there are many agents that can produce the typical dried stem and silvered seed head commonly called silvertop. In short, silvertop is a condition resulting from injury to the vascular bundles of the central stem which bears the seed head. As the stem dies, the upper part of the plant is deprived of moisture and becomes bleached to a silver-white color.

Several species of insects were found to cause silvertop of bluegrass in Northern Minnesota. Each insect damages the stem in a particular and recognizable manner. A separate publication will deal with this facet of the problem. No mites were found to be causing silvertop in this area, but thrips larvae apparently killed bluegrass in those fields which were examined.

Plants often exhibited the typical silvered head and yet did not reveal evidence of attack by insects. No frass, chewing damage, or puncture marks were visable. The central stem was found to be withered just above the terminal joint where the leaf sheath encircled it. Cultures were taken from over 200 silvertop stems from each of three fields of Park variety and three fields of Newport variety. Stems of Park variety were found to be infected with *Fusarium* sp. at the base of the upper internode where the stem was withered. No other pathogenic organisms were isolated from the silvertop stems. The fungus was found only in stems of Park variety and not in Newport variety.

There is evidence that an arthropod may be implicated in transmission of the fungus, or in wounding of the plants so that the *Fusarium* may infect the bluegrass. Eighty insect-proof cages were erected on five fields of blugegrass early in the growing season. Part of the cages were sprayed with Phosdrin ® at the rate of two pounds actual per acre. Phosdrin is a systemic, short residual, organophosphate pesticide of high toxicity. The assumption was made that this spray would kill all of the animal life within the cages. The remainder of the cages were not sprayed.

Evaluation of the plants within the cages were made at the end of the growing season during harvest time of blue grass seed. Silvertop stems were found only in those cages which had not been sprayed. Plants treated with Phosdrin were free of insect-caused silvertop and also free of plants injured by *Fusarium*. Since the netting used to cover the cages was not wind or water proof, it was concluded that probably an unidentified insect or mite was active in the transmission or ingression of the fungus.

SUMMARY

Silvertop of bluegrass is a condition resulting from injury to the vascular bundles of the central stem. Several insects and apparently *Fusarium* fungus can cause the symptoms. The evidence indicates that the fungus has an arthropod vector. Park variety of bluegrass was found to be naturally infected with *Fusarium* in Northern Minnesota, while Newport variety in the same area was not infected.

REFERENCES CITED

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