MONOCLONAL ANTIBODIES FOR RAPID DIAGNOSIS OF SUMMER PATCH AND NECROTIC RING SPOT DISEASES OF TURFGRASSES

OHIO STATE UNIVERSITY
Columbus, Ohio

Drs. William M. Shane &
Stephen T. Nameth
Principal Investigators

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Necrotic ring spot and summer patch diseases of Kentucky bluegrass annual bluegrass, and other turfgrasses are extremely difficult to diagnose with traditional techniques. Research at Ohio State University is focussed on the use of immunological techniques for rapid diagnosis of these two diseases.

A monoclonal antibody-producing clone, LKc50 was developed that was selective for the causal agent of necrotic ring spot [Leptosphaeria korrae {LK}]. The antibody, used in an indirect ELISA test, reacted strongly against all verified strains of LK [>40] tested in laboratory studies, including strains from bermudagrass displaying symptoms of spring deadspot. The antibody did not react significantly with 42 non-LK antigens including Magnaporthe poae [summer patch pathogen], Gaeummanomyces [take-all], plant tissue, and common plant-inhabiting fungi.

Approximately 50% of cultures displaying LK characteristics received or isolated at Ohio State University have not produced the sexual stage [ascospores]. The ELISA test for LK has allowed us to identify these non-sporulating cultures as LK with relatively high certainty.

The ELISA test for LK also allows us to detect the pathogen direct ly on infected plant tissue. Samples of Kentucky bluegrass naturally-infected with LK were collected from Ohio, Washington, and Colorado during the summer and fall of 1989. Antibody of LKc50 reacted significantly with all plant samples from LK-infected turf but not with healthy turfgrass.

The ELISA test for LK in conjunction with standard culturing procedures can verify the presence of this pathogen in turfgrass with low infestations within 9 days. Infected plant tissue is plated on standard isolation media. Next, the ELISA test for LK is done when the fungus has grown out sufficiently to allow sampling with a 7 mm diameter cork borer [approximately 7 days]. This technique is appropriate when amounts of the pathogen on the turf sample are too low to detect directly with the ELISA test.

Monoclonal antibodies for the fungus causing summer patch, Magnaporthe poae [MP], are still under development. The first set of monoclonal antibodies for MP proved to be unsatisfactory. A second set of immunizations has been done with a new set of mice to obtain a set of clones with better selectivity. We expect to have clones with the desired selectivity by summer of 1990.