ing page starts with hot or new features, but the listing of the site's main features really sets the tone for this site as a serious weather watchers location.

The main features are:

WeatherSites - a comprehensive list of over 300 WWW, gopher, telnet, and FTP weather sites on the Internet.

USA Weather - city by city forecasts, current conditions, warnings and graphics for all 50 states.

Radar and Satellite - access to Nexrad and color satellite images.

WeatherCams - live images of weather conditions at over 700 locations in North America.

WeatherMaps - a comprehensive listing of surface and upper air maps, along with temperature, regional weather, and jet stream maps.

Weather Software - a listing of over 24 PC and Mac software applications to chart and follow the weather. Perhaps the best feature of this feature packed site is the clickable Nexrad and regular radar national map. As good as the regular radar that this site can produce is, the Nexrad radar, the recently completed Doppler radar system, is several times better. It is so sensitive that on clear days it can show the temperature differences in the atmosphere as well as a flight of birds. On days with precipitation, it can show the accumulated precip totals as well as highlight areas that may spawn severe weather. Give NOAA a few more years working with this system and we might be pleasantly surprised as to the extra information they learn to produce.

This is an industrial strength Internet weather site. It may not have all the minutia the Agriculturalweather.com has, but it doesn't need it - this is a very impressive site.

RESEARCH SUMMARIES

Dollar Spot Resistance

Plant Disease
Volume 81, Number 11.

Control of Dollar Spot of Creeping Bentgrass Caused by an Isolate of Sclerotinia homeocarpa Resistant to Benzimidazole and Demethyla-tion-Inhibitor Fungicides:

L.L. Burpee, Dept. of Plant Pathology, University of Georgia, Georgia Experiment Station, Griffin

Failure to control dollar spot with with DMI fungicides representing pyrimidine and triazole groups was first reported in 1992 by Vargas, Golembiewski and Detweiler. Confirmation of resistance in isolates of *S. homeocarpa* was disclosed in 1995.

Laboratory and field results indicate that at least one isolate was resistant to both propiconazole and thiophanate-methyl. The reduced sensitivity of the particular isolate to chlorothalonil in vitro was not evident in the field.

Fluazinam, a nonsystemic, pyridylaniline compound, was the only fungicide tested that suppressed dollar spot caused by the isolate to a threshold of less than five percent disease for more than 21 days.

The dose-response data collected in vitro and in the field in 1996 indicate further that a second isolate responded similarly to increasing concentrations of fluazinam. The long-term control of dollar spot provided by Fluazinam was surprising for a nonsystemic material. However, due to extremely low inhibitory concentrations, residual suppression of fungal growth may be longer than other nonsystemic fungicides on leaves, on shoots, and in turfgrass thatch. Fluazinam will be a useful fungicide for management of dollar spot caused by benzimidazole and or DMI-resistant strains of *S. homeocarpa*.

Plant Disease is published by the American Phytopathological Society, St. Paul, MN. (612) 454-7250.

Extremes in pH can result in reduced availability of some plant nutrients and/or toxicity problems. In an establishment study at Penn State, we noticed seedling inhibition following incorporation of a two-inch layer of poultry manure compost (pH of 9.1) into a clay loam soil. It is likely that the high pH and presence of ammonium in the compost caused ammonia toxicity and subsequent death of the seedlings. Fortunately, most soils are buffered against rapid and drastic changes in pH and even composts, with extremes in pH, might not alter the overall soil pH a great deal. To be on the safe side, however, try using materials with a pH as near to neutral (7.0) as possible.

Nutrients

When compared with fertilizers, composts generally contain low amounts of plant nutrients. Whereas a small amount of quick-release ammonium nitrogen is present in some composts, most nitrogen is in the organic form and is slowly available to turf. Studies with composted sewage sludges show that only about 10 percent of the total nitrogen is available to plants during the first growing season. This means that large amounts of compost must be applied to supply all or most of the turf's nutritional requirements.

Little is known about the nitrogen release characteristics of other composts. Other nutrients, such as phosphorus, potassium, calcium and magnesium can be present in significant quantities in composts. Some composts, however, may contain very low concentrations of one or more of these nutrients. Thus, fertilizer supplements may be required.

Many questions remain concerning the availability of nutrients from composts.

In most cases, composts are applied to the soil surface at a rate between a one-inch layer (about 2.2 cu. yds./1000 sq. ft.) and a two-inch layer (about 4.4 cu.yds./1000 sq. ft.) then incorporated into the soil to a depth of four to six inches. In order to get maximum performance from your application, make sure the compost is thoroughly mixed with the soil and is not forming a layer at the soil surface. Depending on the material, this may require several passes with rototilling equipment. The lower rate (one inch layer) would be better for fertile soils and the higher rate (two-inch layer) for sandy soils, clay soils or sub soils low in organic matter). We have found that if more than two inches are used, it can be difficult to mix the material four to six inches into the soil. On heavy soils, it is helpful to rototill the soil first, then apply the compost and incorporate.

From Proceedings of the 51st Northwest Turfgrass Conference, Oct. 1997

RESEARCH SUMMARIES

Bluegrass Nematode Damage

Plant Disease
Disease Notes
Pratylenchus fallax on Turfgrass in Ontario
Q. Yu, J. W. Potter, and G.A. Gilby, Pest Management Research Centre, Vineland Station, Ontario, Canada

Surveys in 1995 and 1997 of golf courses throughout southern Ontario for plant parasitic nematodes revealed evidence of *Pratylenchus* spp. in 13 out of 14 samples taken from fairways. The species in the surveys was identified as *Pratylechus fallax* Seinhorst.

Bluegrass (*Poa pratensis*) was the main type of grass on the fairways surveyed. *P. fallax* might cause signficant damage to turfgrass by directly destroying the roots and the wounded roots might become vulnerable to secondary infection by soilborne pathogens.

Plant Disease is published by the American Phytopathological Society, St. Paul, MN.

Biocontrol Agent Studied for *R. Solani* of Creeping Bentgrass

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Phytopathology, Vol. 88, No. 2

Trichoderma harzianum Rifai has been used as a biocontrol agent to protect plants against root, seed, and foliar diseases and storage rots. Results from field trials indicate that isolates of the biocontrol agent work well under different environmental conditions, possibly biocontrol of *Rhizoctonia solani* on creeping bentgrass plants. However, a number of *T. harzianum* strains must be selected for their activity against pathogens on different crops because the survival traits of these strains can be strongly influenced by crop-specific environmental factors. Studies are now taking place with creeping bentgrass.

Biocontrol agents differ fundamentally from chemical fungicides in that they must grow and proliferate to be effective. Therefore, effective antagonists must become established in crop ecosystems and remain active against target pathogens during periods favorable for plant infection. The survival ability of biocontrol agents needs to be surveyed and associated with biocontrol effects.

Introduced strains of *Trichoderma* spp. are difficult to distinguish from indigenous strains. Moreover, the distribution of the biocontrol agent is difficult to ascertain on crop plants. Production of strains containing reporter or marker genes has provided a new tool for detection.

Transformed strains must be genetically stable and able to maintain their biocontrol activity after introduction to soil or foliage. Results from our mycelial growth rate and biological control of brown patch disease tests indicated there might be a positive correlation between the growth rate and biocontrol ability of transformants. Consequently, it is important to compare the physiological traits and biocontrol ability of the transformants with original strains before carrying out time-consuming ecological studies.

Trichoderma spp. were detected three hours after application and conidia were seen one day after treatment on all parts of creeping bentgrass plants. This widespread distribution probably occurred because of the high spray volume to surface area used. Creeping bentgrass plants are small with a relatively dense but shallow root system. Conidia are easily carried by mass flow of water over the root surface in soil. Similarly, spray applications in field trials produced high levels of root colonization by *T. harzianum* strain.

In our experiments, both transformed and wild-type *Trichloderma* strains colonized and proliferated on all parts of creeping bentgrass plants for the duration of the experiments.

It has been demonstrated that *T. harzianum* produces enzymes that are toxic to a wide range of fungi. The data in this paper indicate that *T. harzianum* damages *R. Solani* at a distance. However, there could be several mechanisms by which this occurs, and several kinds of metabolites toxic to *R. Solani* might be produced by *T. harzianum*. The findings in this paper provide insight for future research.

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