Previewing New Materials for the Control of TURF DISEASES

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WHICH NEW fungicides will the greenkeepers find most useful?

Chemical laboratories are releasing a steady stream of new products designed to control diseases on agricultural crops, and included are many compounds potentially valuable for golf courses. In the past, fungicides have not been developed especially for turf grasses because other crops required greater volumes of these materials. In addition, there have been too few facilities for comparing the disease controlling powers of fungicides on golf courses and lawns, supervised by qualified scientists.

Research on turf diseases has been in effect and is being carried forward at the Rhode Island Agricultural Experiment Station. The Greens Section of the USGA is collaborating, together with a voluntary group of greenkeepers all over the country who conduct the final trials on their courses. It is evident, that tests made in one location, with a given set of growing conditions, cannot be applied everywhere in the United States, and that all turf diseases are not present in Rhode Island. However, this project is a beginning in bridging the gaps between the chemical laboratory, the manufacturer, and the practical, effective use of the fungicide on the playing green or lawn. The prevalence of fungus diseases differs on the several greens of one golf course, and in the different climatic and cultural conditions of various sections of the country. This alone precludes the development of a single material that will satisfy everybody.

As the investigation progresses, the Utopia of discovering one fungicide which will control all the diseases all the time is gradually fading. This means that turf superintendents must learn to diagnose the various diseases by recognizing the typical symptoms and signs, and treating accordingly with proper chemicals.

Laboratory Tests

The first step in assaying new products is to screen them in the laboratory and greenhouse. Every year, more than 100 especially synthesized chemicals are tried for fungus-killing power, for toxicity to plants, and for ability to combat fungi regardless of weather conditions. These tests eliminate some materials, and give ideas as to how others may be improved by the chemists. Such laboratory experiments, within a relatively short time, yield results that would require months or years of tedious work in the field.

Field Trials

Following laboratory screening, perhaps 10 new formulations appear good enough to try on plots in the field. The trial grounds are so designed that 5 replications of 24 fungicides can be compared on each of 4 different bent grasses. Adjacent large blocks of Piper velvet, Colonial, creeping C-15, and creeping C-19, differing in susceptibility to disease fungi, are used. Random scattering of the chemical treatments over the area in part compensates for variability in the incidence of disease. Untreated blocks serve as controls. Since the effective dosage of the chemical to use is unknown, a geometrically progressive dosage series is applied at rates such as 1, 2, 4, and 8 ounces of toxicant, in 10 gallons of water per 1000 square feet. This, to a large extent, removes the guess work from determining what amount of fungicide will give the most complete control when applied at stated intervals.

New Chemicals

This project has already demonstrated the specificity of fungicides, both old and new, for those fungi which cause turf diseases. One fungicidal chemical Isonol DL1—makes the "poling" of greens unnecessary for at least 5 mornings after it has been applied, because it keeps the dew drops from sticking to the blades of grass.

Several types of fungi inhabiting the soil may cause damping-off of the young plants; the damage being noticed when the

(*Continued on Page* 74)

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Turf Disease Control

(*Continued from Page 49*)

plants are in the second or third leaf stage, or when about one-half inch high. A single application of Spergon (1 1-3 oz. in 10 gallons of water to 1000 square feet) on newly seeded Colonial bent checked a severe case of damping-off, caused in this instance, by a **Fusarium sp.**

To date, the top ranking compounds for control of large brown patch **(Corticium vagum)** are Zerlate, Puraturf, Thiosan (Tersan), and Calo-Clor. The fungicidal value of the Calo-Clor was somewhat off-set by the considerable injury or "burn" it caused during hot weather. In a series of tests, "Suspension" Calo-Clor 3285 proved to be somewhat superior to Calo-Clor. This was probably due to the more uniform distribution of the toxicant obtained with the "Suspension" form of Calo-Clor.

The outstanding materials for control of dollar spot **(Sclerotinia homoeocarpa)** have been Thiosan (Tersan), Puraturf, and Calo-Clor. Injury has not been evident on any of the plots treated with Puraturf, and in most cases, Thiosan can also be considered to have a wide margin of safety. So far, only one instance of "burning" has been recorded with Thiosan on the Rhode Island plots; this was observed in 1944 on less vigorous strains of velvet bent.

Standard turf fungicides failed to control copper spot **(Gloeocerocospora sorghi)** on Piper velvet bent in tests in Rhode Island, but Puratized 177, Puraturf, and Zerlate prevented the disease even though it was prevalent on surrounding plots in epidemic proportions. Forty days after treatment, less than 1% disease could be found in plots to which Puraturf and Puratized 177 had been applied, while about 3% disease was observed in those plots treated with Zerlate. Puratized 177 plots were still 99% free two months after treatment, whereas the Puraturf and Zerlate plots

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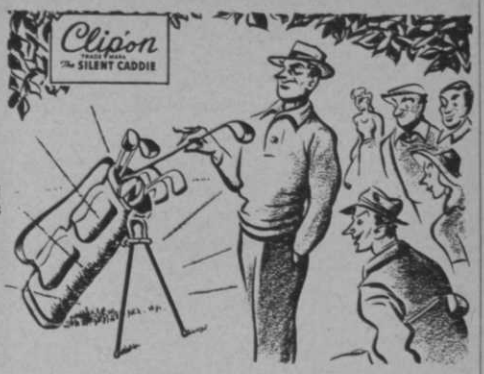

showed 6% and 15% disease, respectively. In these same tests, as much as 24% of the grass was injured by copper spot on the check areas.

New Developments

At present, the development of turf fungicides is largely an empirical, or trial and error method. Certain special techniques are being used to determine the potential fungicidal value of chemicals, but placing the control of turf diseases on a firm scientific basis must await the knowledge of how the toxicant inhibits or stops the fungus and what is the mechanism involved. Along with developing new disease controlling agents, fundamental studies should be undertaken on the life processes of turf fungi and the lethal action of the fungicidal chemical on the organisms.

View of the experimental plots at Rhode Island where turf disease studies are conducted.

WAR DEPT. CITES MONTEITH—John Monteith, Jr., widely known in golf for his work with the Green Section, has been awarded a War Dept. "commendation for meritorious civilian service." Monteith s award was accompanied by a letter from Maj. Gen. Thomas M. Roberts, the army's acting chief of engineers, lauding Monteith for pioneering in army turf work for control of erosion and dust at military installations and for assisting "in the engaging of other experts for army engineers' field offices." Among those "other experts" were Frank Wilson, George Milnes, Harry Burkhardt, Ed Cale, Bob Dunning, Gordon Jones, John Bengston, Marshall Farnham, Howard Goldthwaite, Jimmy Blackledge, Stan Graves, Claude Whalen, Gus Brandon, O. S. Baker, Norman Johnson, and Joe Lentz, together with other ace greenkeepers.

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