

Test PC Wet, Dry and With Sludge for Weed Control

By W. E. ZIMMERMAN*

Since 1948, potassium cyanate, (KOCN), for many years useful in industry as a reagent, has performed excellently in experiments as a crabgrass, chickweed and other turf weed eradicator. Results in 1949 and 1950, at experiment stations throughout the United States and Canada, substantiated the early results (with potassium cyanate) when applied as a spray. KOCN, or PC as it became known during 1950, was sold to formulators who manufactured potassium cyanate crabgrass killers under their brand names.

Preliminary research at experiment stations in 1950 showed PC solutions with wetting agent added could be effective as a crabgrass and chickweed killer when applied with an ordinary watering can.

Also, it was found in preliminary studies, potassium cyanate was effective as a crabgrass killer when applied in dust form and when mixed with some forms of organic fertilizers.

Due to conflicting reports on chemical crabgrass control in previous years, standardized trials were carried out in 1951, coordinated by the USGA Green Section, under the supervision of Fred V. Grau. Al Radko, Agronomist for the Green Section, supervised this trial which included comparisons of sodium arsenite, PMAS and PC. Applications, wetting agents, dosages, etc., were standardized in all tests.

The trial was made up of three treatment series, (1) Spring, (2) Summer (3) Fall and a comparison of a Fall series superimposed over a Spring series of treatments.

Indications are that mid-Summer applications of PC are not as effective as Spring, late Summer or Fall applications. Three applications of eight pounds of PC with Igepon wetting agent gave good results applied as a spray in these trials.

Nine experiment stations remained in the program until the trials were completed. These were: Los Angeles, Calif.; Lafayette, Ind.; Ames, Ia.; Manhattan, Ks.; Beltsville, Md.; St. Paul, Minn.; Wooster, O.; Kingston, R. I.; and College Station, Tex.

Materials for the trials were supplied by American Cyanamid Co., Chipman

Chemical Co. and O. E. Linck Co. Wetting agent was supplied by General Dye-stuff Co.

PC Treatments with a Watering Can

Rates selected for watering can tests were 5, 10 and 15 level teaspoons of KOCN in 1½ to 3 gallons of water per 100 sq. ft.—with wetting agent added.

Material was sent to experiment stations and to American Cyanamid Co. field agriculturists and sales representatives. The area involved most of the United States and Canada. Reports indicate this method is effective for crabgrass control. Rates most effective were 10 and 15 teaspoons of PC in 2 gallons of water per 100 sq. ft. This corresponds to approximately 0.6 and 0.9% solution strength. Ten teaspoons, or 0.6% solution was less damaging to turf grasses. Five teaspoons or 0.3% did not give effective control. The 10 teaspoon rate required two applications.

This method of treatment was also effective for chickweed and several other common turf weeds. It was noted that late Summer and early Fall treatments with a watering can were less severe on turf grasses than mid-Summer treatments. Favorable reports were received from the Ontario Agricultural College, Purdue University, University of Minnesota, and the Alabama Polytechnic Institute on the watering can technique for applying PC.

More information is desirable on time of application, height of cut etc. but from observations during 1951, it appears to be a promising method of application.

PC Dust Formulations

Both 10 and 20 per cent PC dust formulations were used in 1950 preliminary turf weed control trials. Comparisons were made of 8, 16 and 32 lbs. of actual potassium cyanate per acre in single and double applications. Sifters and shaker type devices were used in making these applications.

Preliminary results were encouraging enough to warrant further study. A 25% dust formulation was distributed to the American Cyanamid staff, experiment stations, and PC Formulators' Research Departments. Eight-ounce containers of the 25% dust were distributed for application on 150 sq. ft.—equal to a 32 lb.

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TURNING THE DESERT INTO AN OASIS AT THE DESERT INN

This will look like a great new course in a few months. Wilbur Clark looks over some of the watering equipment that's making the desert back of his Desert Inn at Las Vegas, Nev., bloom with fairways, greens, tees, trees and shrubs.

per acre rate of PC. Previous years' results showed the dust was about 50% as effective as a spray solution of PC with wetting agent. The 32 lb. rate of dust, therefore, was equivalent to about 16 lbs. of PC in solution. Experimenters were encouraged to compare the effectiveness of the dusts with equivalent solutions of PC.

Results of these studies conducted at experiment stations in New Jersey, Pennsylvania, Alabama, and Minnesota, indicated that turf weeds could be satisfactorily controlled by dust formulations. More detailed studies at New Jersey (which included 10 and 20% blends), showed that a 10% dust was more effective when a wetting agent was added. The results showed that the 25% dust was too severe on turf grasses. The 1951 PC dust studies again indicated solutions of PC with a wetting agent superior to an equal dosage of PC dust. However, the New Jersey Station reported at the Northeastern Weed Control Conference that they thought the 10% dust used several times during a season would give adequate control of crabgrass.

Another important observation from the Georgia Coastal Plain Station at Tifton and the Green Section Trials at Beltsville, was that applications early in the morning or late in the evening gave best results with PC dusts. Pre-watering of the turf before treatment did not in-

crease the efficiency of the dust. Kentucky Bluegrass is exceptionally resistant to PC dust injury.

There is sufficient information on this method to further expand the testing program during 1952.

PC - Activated Sludge Combination

Some preliminary experiments with potassium cyanate in combination with one of the commercial activated sludges, indicated the possibility of applying PC mixed with such materials. Several late season applications of PC dust mixed with an activated sludge were made at the Winged Foot GC, Mamaroneck, N.Y. for crabgrass and knotweed control during the Fall season of 1949. One pound of 2,4-D was added to the first mixture of 16 pounds of PC and 600 pounds of activated sludge, per acre. Second and third applications of PC and activated sludge without 2,4-D were applied 10 to 14 days apart on a selected fairway. The area was heavily infested with clover, crabgrass and knotweed. Warren Lafkin, White Plains, New York and Harold LeFurgey, G. Supt. at Winged Foot, cooperated with American Cyanamid Co. in this study.

These trials showed promise for fairway renovation and turf weed control. In 1951 tests were made in cooperation with the Milwaukee Sewerage Commission. 16 different lawns, parks, turf plots, golf courses and cemeteries were treated with

Renovate Fairways to Eliminate Poa Annua

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a combination of PC blended with activated sludge from the Milwaukee Sewerage Commission. In addition, many co-operators throughout the country including home owners, country clubs, commercial agencies and state and federal workers, made PC-activated sludge combination trials at various timings and rates. Dr. O. J. Noer, Agronomist with the Milwaukee Sewerage Commission, deserves most of the credit for organizing this series of tests. His cooperation was outstanding.

It was suggested that an 8 lb. rate of PC spray solution be compared with 8, 16 and 32 pounds per acre of PC, applied with the sludge. The sludge-blend was 5% PC, 5% fine sludge and 90% regular commercial activated sludge, applied 15 lbs. to 1000 sq. ft. of area with a fertilizer spreader. The various rates of PC were obtained by adding sludge to make up the 15 lb. rate per 1000 sq. ft.

The majority of the cooperators in this trial reported favorably and want to continue this experiment again in the 1952 season.

Treatments as high as 32 lbs. of PC, applied as many as five times at weekly intervals, did not injure the turf. Many cooperators reported the turf in better condition at the end of the treatment period than it was when the tests began.

It appears that 12 to 16 pounds of PC applied with activated sludge several times during the latter part of the growing season, gives excellent crabgrass control. From experience in 1949, one pound of the amine form of 2,4-D per acre added to the mixture in the first treatment, controls not only crabgrass but knotweed, some clover, goosegrass and several other common turf weeds. The success of the PC-sludge combination presents new promise in turf weed control.

Other Dry Applications

Work by Dr. B. P. Robinson at the Tifton Research Center indicates PC at 8 lbs. per acre can be applied with a dry sandy soil for topdressing and crabgrass control on Georgia putting greens without turf injury. Laboratories indicate there are other dry materials that can be combined with PC for application with shaker type applicators and fertilizer spreaders, and these will be available for testing in 1952.

DELBERT DEWEY HEADS FINGER LAKES SUPTS.

Delbert Dewey, supt., Canandaigua (N. Y.) CC, was elected pres., Finger Lakes Greenkeepers' Assn. at the organization's May 13 meeting. Carl A. Lawer, Durand Eastman GC, Rochester, N. Y., was elected vp., and Lester L. Bixler, Seneca Lake CC, Geneva, N. Y., was elected sec-treas.

We are still groping for the right answer to this problem of poa and what is best to do about it.

We are of course carrying on an adequate fertilizer program to give our permanent grasses as much chance to compete with the poa as possible during the poa's off seasons. The permanent grasses in our fairways are predominantly Seaside and Astoria bent. Soil tests are made regularly and the program is carried out in accordance with the needs as shown by these tests. Agrico of various analyses, Milorganite and lime have been used. The fertility of our soil is now good.

We are doing some experimenting with light application spraying of sodium arsenite to prevent seeding. The rate of application was 1 lb. of sodium arsenite in 5 gals. of water. This amount of spray has no noticeable effect on the bents. What effect it will have in controlling poa I am not at this time prepared to say, as there are several factors that I feel have a direct bearing on the results of this treatment such as old seed lying dormant in the soil waiting for an opportunity to germinate and produce a plant. Weather and time of application I am sure are very important in the results of this type of treatment.

We are, however, enough convinced that this method has merit to go on with the experiment for the next three or four years if necessary to see if we can come up with something worth while. We are and will continue to keep our records and if anything does come of it we will be glad to report our findings. My personal feeling about this treatment is that it is not the answer if you have a heavy infestation of poa at present but will be of great value in preventing a recurrence of the spread of this grass once the fairways have been renovated and as nearly as possible cleared of poa.

Fairway Renovation Plan

We have done a complete renovation on our No. 1 fairway and if it looks as good in the late summer of this coming season as it does at present we are prepared to close the first nine this fall and do the remaining eight holes, then in 1953 close the other nine and repeat the process.

We do not feel that it would be advisable to close the whole course at one time so that the members have no place to play at all. The same line of reasoning was why we did just one fairway this year, so that the members could see what can be accomplished by a complete renovation and be more willing to go along with the