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[54] **CYCLOTRIPHOSPHAZATRIENE-DERIVATIVES AS SOIL UREASE ACTIVITY INHIBITORS**

[76] Inventors: **Ramiro Medina,** 105 Fountain St., Sheffield, Ala. 35660; **Jack M. Sullivan,** 106 Patsy Dr., Florence, Ala. 35630

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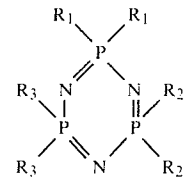
[52] **U.S. Cl.** ..... **435/168;** 435/227; 260/927 N; 423/302

[57] **ABSTRACT**

Tests show that 2,2,4,4,6,6-hexaaminocyclotriphosphazatriene, 2-phenoxy-2,4,4,6,6-pentaaminocyclotriphosphazatriene, 2,4-diphenoxy-2,4,6,6-tetraaminocyclotriphosphazatriene and 2,4,6-triphenoxy-2,4,6-triaminocyclotriphosphazatriene (also frequently called phosphonitrilic derivatives) of the formula



are highly effective inhibitors of urease activity in agricultural soil systems wherein

(1) $R_1 \ldots R_3' = NH_2$ or

(2) $R_1' = R_2' = R_3' = R_2 = R_3 = NH_2$ and $R_1 = OC_6H_5$ or

(3) $R_1' = R_2' = R_3' = R_3 = NH_2$ and $R_1 = R_2 = OC_6H_5$ or

(4) $R_1' = R_2' = R_3' = NH_2$ and $R_1 = R_2 = R_3 = OC_6H_5$

The above-mentioned compounds and mixtures of the compounds show sustained inhibition of the soil urease activity for periods of at least 21 days.

25 Claims, 4 Sheets Drawing,

40 Pages Specification

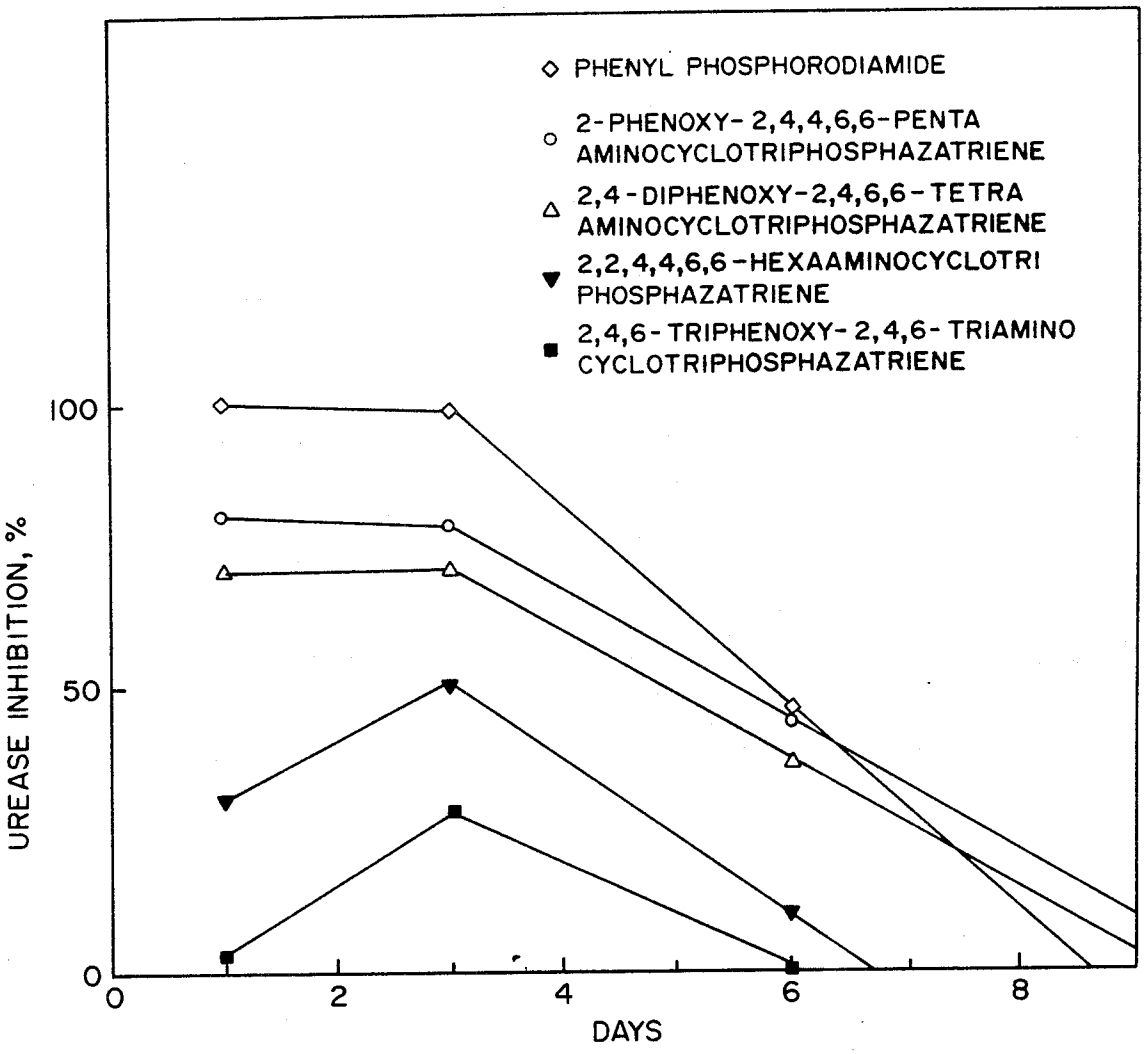

◇ PHENYL PHOSPHORODIAMIDE
○ 2-PHENOXY-2,4,4,6,6-PENTA AMINOCYCLOTRIPHOSPHAZATRIENE
△ 2,4-DIPHENOXY-2,4,6,6-TETRA AMINOCYCLOTRIPHOSPHAZATRIENE
▼ 2,2,4,4,6,6-HEXAAMINOCYCLOTRI PHOSPHAZATRIENE
■ 2,4,6-TRIPHENOXY-2,4,6-TRIAMINO CYCLOTRIPHOSPHAZATRIENE
UREASE INHIBITION, %
100
50
0
0
2
4
6
8
DAYS

Fig. I

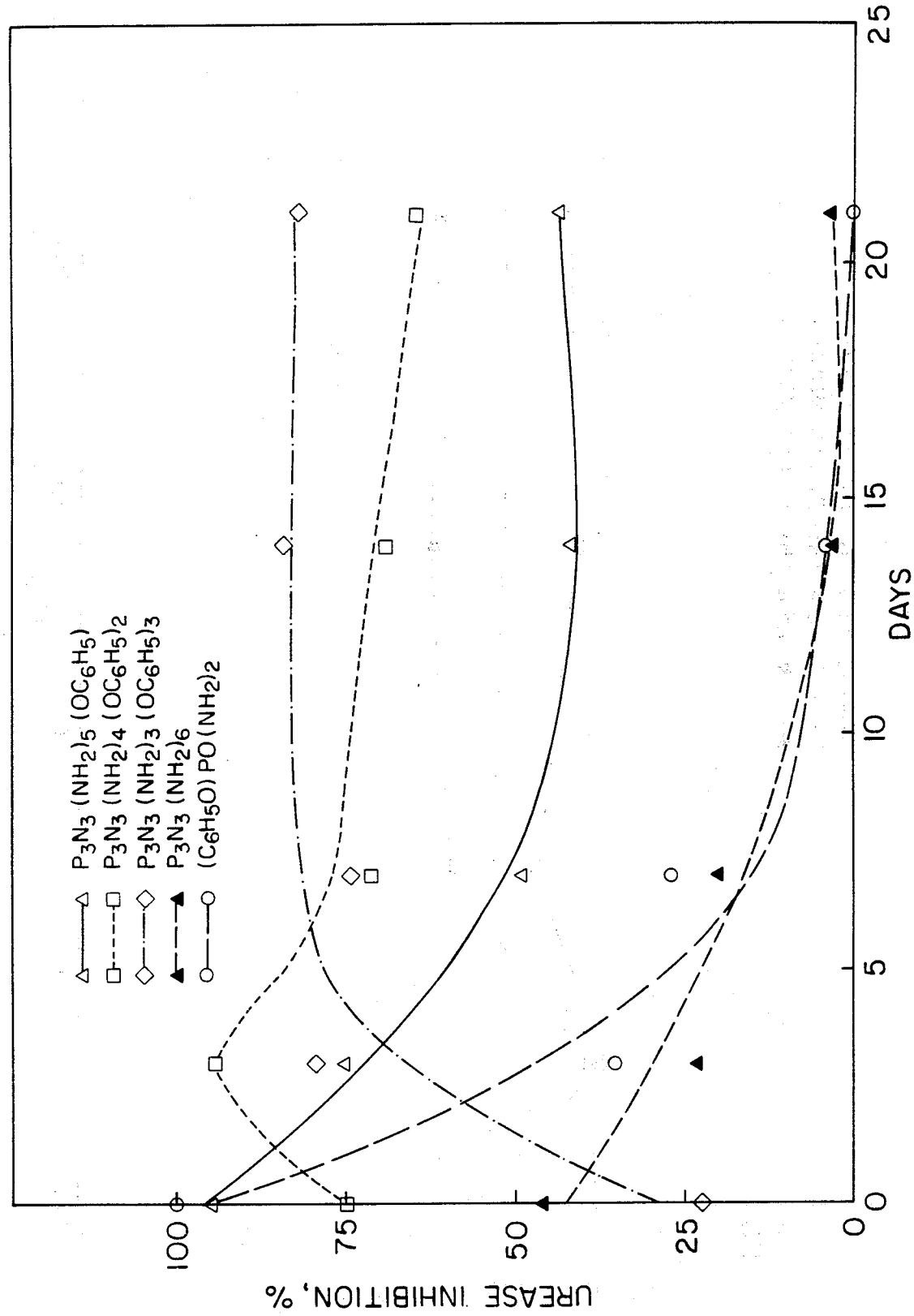

UREASE INHIBITION, %
100
75
50
25
0
0
5
10
15
20
25
DAYS
$P_3N_3(NH_2)_5(OC_6H_5)$
$P_3N_3(NH_2)_4(OC_6H_5)_2$
$P_3N_3(NH_2)_3(OC_6H_5)_3$
$P_3N_3(NH_2)_6$
$(C_6H_5O)PO(NH_2)_2$

Fig. 2

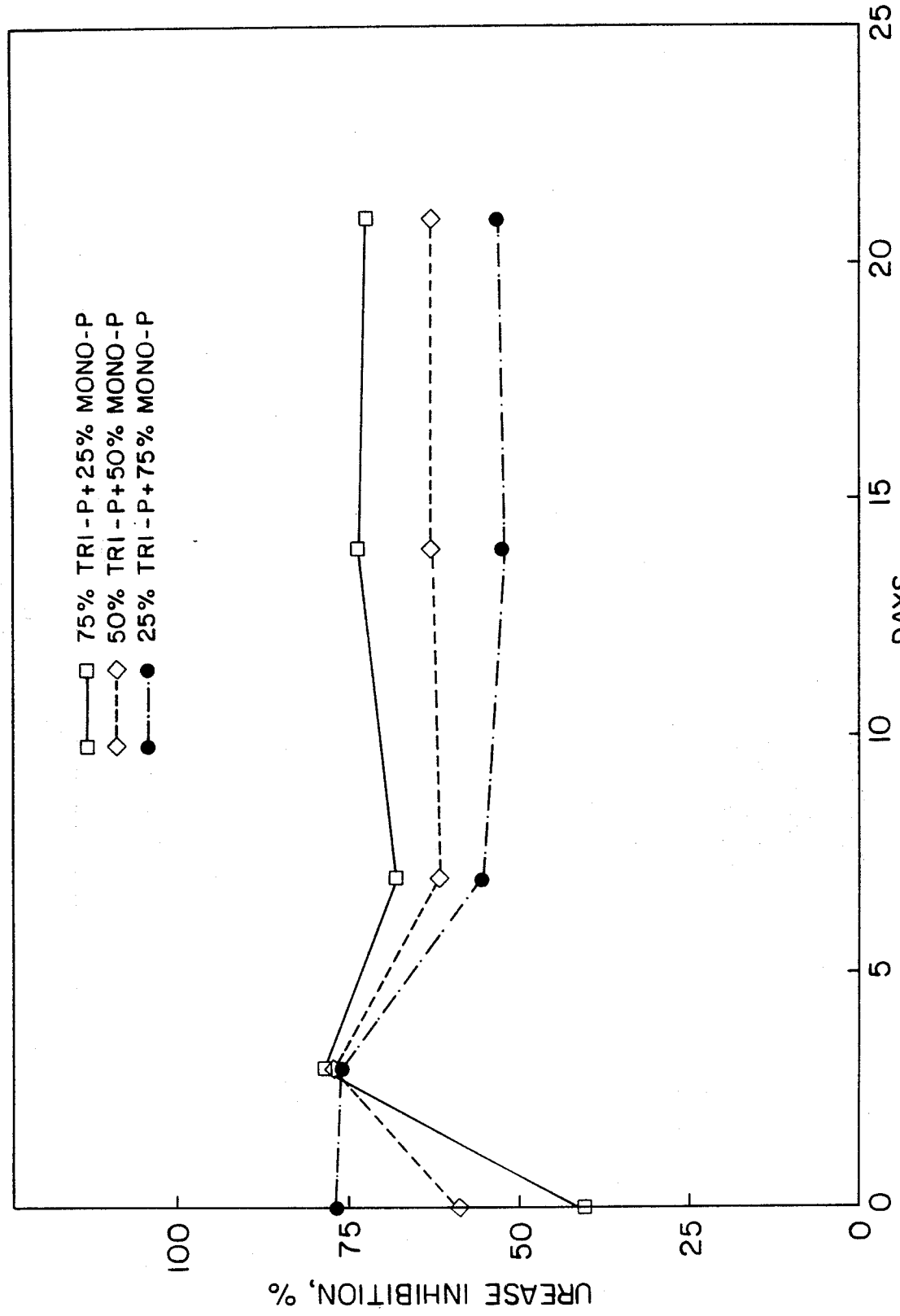

75% TRI-P+25% MONO-P
50% TRI-P+50% MONO-P
25% TRI-P+75% MONO-P
UREASE INHIBITION, %
100
75
50
25
0
0
5
10
15
20
25
DAYS

Fig. 3

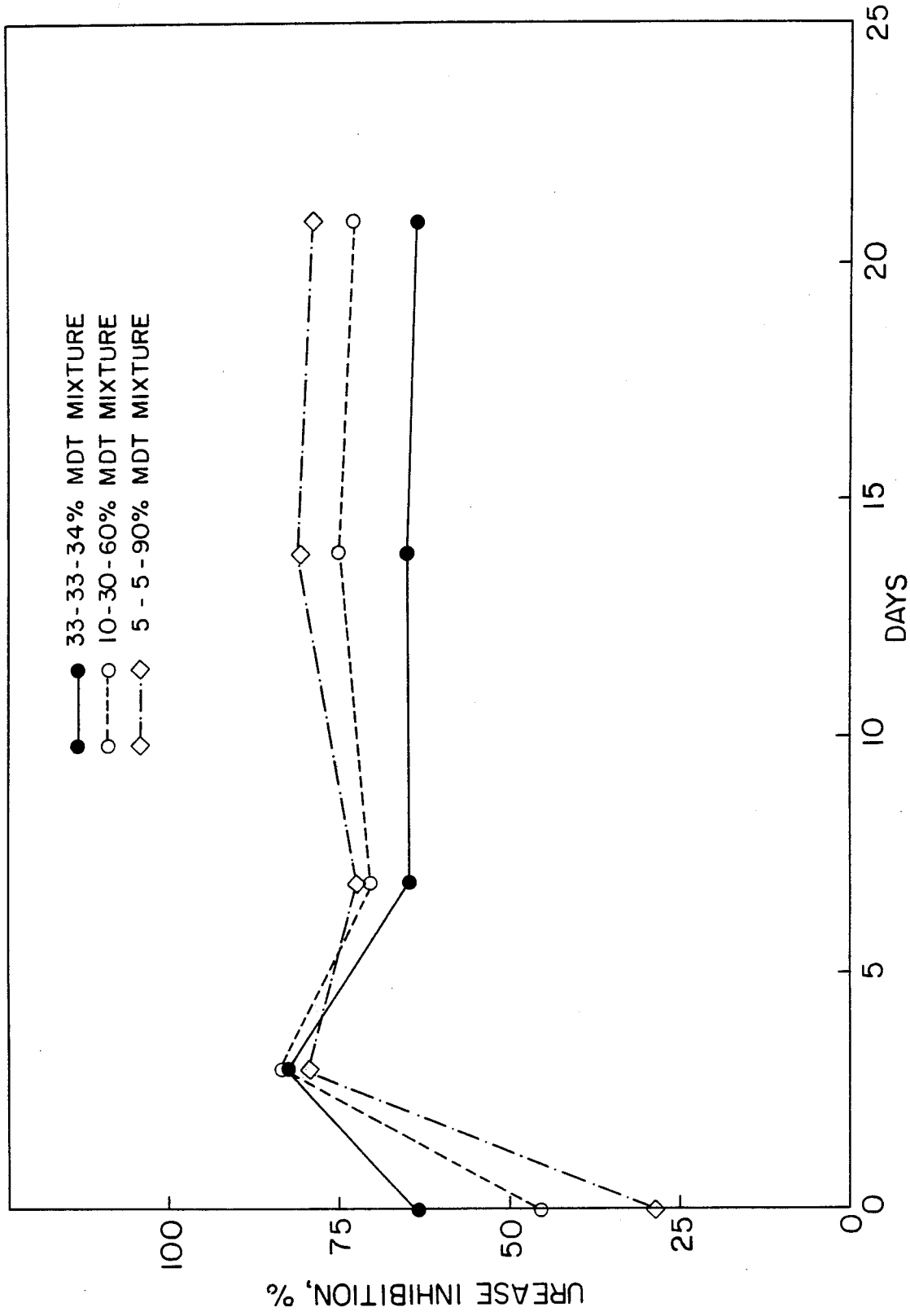

33-33-34% MDT MIXTURE
10-30-60% MDT MIXTURE
5 - 5 - 90% MDT MIXTURE
UREASE INHIBITION, %
100
75
50
25
0
0
5
10
15
20
25
DAYS

Fig. 4