

PATENT SPECIFICATION

814,949



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International Classification:—A611. C05d, f.

COMPLETE SPECIFICATION

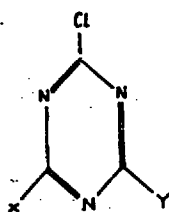
Improvements in and relating to Plant Growth Influencing Compositions

We, J. R. GEIGY A.-G. a body corporate organised according to the laws of Switzerland, of 215, Schwarzwaldallee, Basle, Switzerland, do hereby declare the invention, for which we

5 pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 The present invention is concerned with new compositions for influencing, and more particularly, inhibiting the growth of plants and with methods of applying these compositions for influencing the growth of plants.

15 The surprising observation has been made that s-triazine derivatives of the general formula:



20 wherein X represents a hydrocarbon radical bound by way of O, S, or NH or two hydrocarbon radicals bound by way of N, the hydrocarbon radical(s) possibly being substituted by chlorine or hydroxyl groups, and Y represents hydrogen, chlorine, the mercapto group or a hydrocarbon radical bound either direct or by

25 way of O or S, the hydrocarbon radical possibly being substituted by chlorine or hydroxyl groups, and wherein any aromatic rings in the radicals X and Y should not be bound direct to the triazine ring or to the bridging

30 atom, have an inhibitory influence on the growth of plants, or may even have a lethal action, even in very low concentrations.

According to the present invention therefore compositions for influencing the growth of

plants, especially for killing weeds, are provided comprising an s-triazine derivative of the above general formula and, as a carrier,

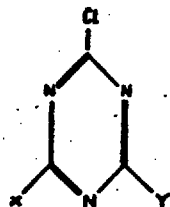
- (a) a water-insoluble pulverulent solid, or
- (b) an organic solvent boiling above 150° C., or
- (c) an emulsifying agent together with a water-insoluble pulverulent solid or an organic solvent.

The greater part of such s-triazine derivatives are easily produced by reacting cyanuric chloride with one mol of a suitable amine and/or one mol of a suitable alcohol or mercaptan, or with two mols of suitable alcohols and/or mercaptans. This reaction can be performed in steps.

Compounds of the formula defined above are excellently suitable as active ingredients for weed killers, both for the killing of weeds among cultivated plants (selective herbicides) and for the total elimination or inhibition of undesired plant growth (overall toxic herbicides). The word "weeds" here also means undesired cultivated plants, e.g. those which have been previously planted or those which are planted in neighbouring areas. In addition, the compounds defined above also exert other inhibitory influences on the plant growth and may be used for example in particular for defoliation, e.g. of cotton plants, acceleration of ripeness by desiccation, e.g. of potato plants, blossom thinning, retardation of blossoming, or prolongation of the harvesting period and storing propensities. Also the use of herbicides can be of interest in the long run if the selectivity of the agent is insufficient, to exclude a reduction of the yield of the cultivated plants at the time of the application.

The following triazine derivatives are examples of active ingredients which can be used. The known compounds are shown under A; compounds which have not been described up to now are given under B together with their melting or boiling points.

[Price 3s. 6d.]



A) Y	X
CH ₃ -O-	CH ₃ -O-
C ₂ H ₅ -O-	C ₂ H ₅ -O-
Cl	C ₂ H ₅ -NH-
Cl	(C ₂ H ₅) ₂ N-
Cl	n-C ₄ H ₉ -NH-

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B) Y	X	
Cl	n-C ₃ H ₇ -NH-	M.Pt. 72—74.5°
Cl	(n-C ₃ H ₇) ₂ N-	M.Pt. 56—58°
Cl	CH ₂ CH-CH ₂ -NH-	M.Pt. 73—76°
C ₂ H ₅ -O-	C ₂ H ₅ -NH-	M.Pt. 86—89°
C ₂ H ₅ -O-	(C ₂ H ₅) ₂ N-	M.Pt. 48—50°
Cl		M.Pt. 103—105°

15 The plant growth influencing compositions according to the invention are either solutions, emulsions, suspensions or dusts. All application forms must contain the active substance in fine distribution. In particular, when total destruction of plant growth, premature desiccation or defoliation are desired, the effect can be increased by the use of carriers which are phytotoxic themselves such as, e.g. high boiling mineral oil fractions or chlorohydrocarbons. On the other hand, the selective inhibition of plant growth, e.g. selective weed killing in general may be better attained by the use of inert carriers.

20 Organic solvents boiling above 150°C., such as, e.g. cyclohexanone, aliphatic hydrocarbons e.g. kerosene, cyclic hydrocarbons e.g. tetrahydronaphthalene, alkylated naphthalenes and mineral and vegetable oils or mixtures of the above solvents are used for the production of solutions.

30 Aqueous application forms are made from emulsion and dispersion concentrates by adding water. The substances as such or dissolved in lower boiling solvents, such as alcohols e.g. ethyl or isopropyl alcohol, ketones e.g. acetone, or benzene, toluene, xylene or chlorinated hydrocarbons e.g. tetrachloroethane or ethylene dichloride, or in one of the above named solvents boiling above 150°C., are homogeneously incorporated into water by means of wetting or dispersing agents. Examples of cation-active emulsifiers or dispersing agents are quaternary ammonium compounds; examples of anion-active emulsifying agents are soap, soft soap, aliphatic long chained sulphuric acid monoesters, aliphatic aromatic sulphonic acids, long chained alkoxyacetic acids; examples of non-ionic emulsifiers are polyethylene glycol

ethers of fatty alcohols and polyethylene oxide condensation products. Also, concentrates can be produced consisting of active substance, emulsifier or dispersing agent and, if necessary solvent. These latter are suitable for dilution with water.

Dusts can be produced by milling or blending active substance with a water-insoluble pulverulent solid carrier. Examples of such are: Talcum, diatomaceous earth, kaolin, bentonite, calcium carbonate, tricalcium phosphate, sawdust, powdered cork, charcoal or other materials of vegetable origin. On the other hand, the carriers can be impregnated by means of a volatile solvent. Dusts and pastes can be suspended in water by the addition of wetting agents and protective colloids and so used as spraying agents.

As there exist both liquid and solid active compounds of almost the same herbicidal activity, both liquid concentrates for aqueous emulsions and wettable concentrates for aqueous suspensions with a high concentration of the active ingredient can easily be prepared. The various forms of application can be adapted to the intended use in the usual way by the addition of substances which improve the distribution, the adhesive properties, resistance to rain and, possibly the resorption. Such substances are: e.g. fatty acids, resins, wetting agents, glue, casein, or alginates. In the same way, the biological activity can be increased or amplified by the addition of substances which have a bactericidal or fungicidal action or of substances which also influence the growth of plants, as well as by combination with fertilisers.

The invention will be more clearly understood by reference to the following Examples

in which Example 1 illustrates a suitable composition and Examples 2 to 4 illustrate the range of application mentioned in the description, being chosen examples of laboratory and field tests and the results obtained.

EXAMPLE 1.

10 Parts of 2-chloro-4:6-dimethoxy-s-triazine are dissolved in 90 parts of a high boiling liquid such as, e.g. coal tar oil, Diesel oil or spindle oil.

EXAMPLE 2.

A seed box was prepared as follows: in one half of the box 10 seeds of wheat, of mustard, of lucerne and of carrot were sown 3 cms. deep and in the other half 10 seeds of each of the above types of plants were sown 1 cm. deep. The seed box was lightly watered. It was then sprayed with 0.1 litre per sq. m. of a 2% suspension of the compound to be tested, which corresponds to 2 g. of active ingredient per sq. m.

After 21 days, the lucerne in the seed box treated with 2:4-dichloro-6-ethylamino-s-triazine had died whilst the other plants were uninjured.

EXAMPLE 3.

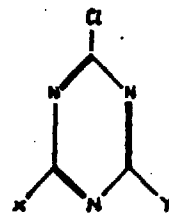
0.5% Emulsions of 2:4-dichloro-6-n-propylamino-s-triazine, 2:4-dichloro-6-n-butylamino-s-triazine and 2:4-dichloro-6-allylamino-s-triazine sprayed on to oats and mustard plants about 10 cms. in height caused severe leaf burns. 0.5% Emulsion of 2-chloro-4:6-dimethoxy-s-triazine or 2:4-dichloro-6-methylamino-s-triazine also caused leaf burns on mustard plants.

EXAMPLE 4.

A dust produced from 10 parts of 2-chloro-4:6-dimethoxy-s-triazine and 90 parts of talcum as carrier applied to 3-4 week old cotton plants, caused severe leaf burn within 1-3 days after application.

WHAT WE CLAIM IS:—

1. Composition for influencing the growth of plants, especially for killing weeds, comprising an s-triazine derivative of the general formula:



wherein X represents a hydrocarbon radical bound by way of O, S or NH or two hydrocarbon radicals bound by way of N, the hydrocarbon radical(s) possibly being substituted by chlorine or hydroxyl groups, and

Y represents hydrogen, chlorine, the mercapto group or a hydrocarbon radical bound either direct or by way of O or S, the hydrocarbon radical possibly being substituted by chlorine or hydroxyl groups,

and wherein any aromatic rings in the radicals X and Y should not be bound direct to the triazine ring or to the bridging atom, and, as a carrier,

- a) a water-insoluble pulverulent solid, or
- b) an organic solvent boiling above 150°C., or
- c) an emulsifying agent together with a water-insoluble pulverulent solid or an organic solvent.

2. Composition as claimed in claim 1 in which the s-triazine derivative is 2:4-dichloro-6-ethylamino-s-triazine.

3. Composition as claimed in claim 1 or 2 in which the carrier is phytotoxic.

4. Composition as claimed in claim 1 or 2 in which the carrier is inert.

5. Composition for influencing the growth of plants substantially as herein described with reference to and as illustrated in any of the foregoing Examples.

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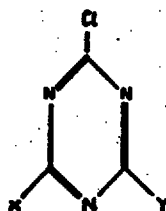
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