

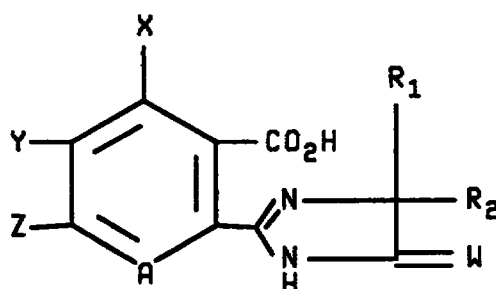
## Description

## BACKGROUND OF THE INVENTION

The recent discovery of a potent new class of herbicidal compounds, known as the imidazolinone compounds, has resulted in considerable field testing of these compounds for various uses worldwide.

Novel imidazolinyl benzoic acids, esters and salts, their preparation and use are disclosed in United States Patent 4,188,487 and United States Patent 4,297,128, while various novel pyridine and quinoline imidazolinone compounds are described in the literature.

The free acids of these compounds may be represented in general by formula I below



( I )

wherein

A is CH; N or N→O;

W is oxygen or sulfur;

X is H, halogen, methyl or hydroxyl;

Y and Z are each hydrogen, halogen, C<sub>1</sub>-C<sub>6</sub> alkyl, hydroxyloweralkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy, C<sub>1</sub>-C<sub>4</sub> alkylthio, phenoxy, C<sub>1</sub>-C<sub>4</sub> haloalkyl, nitro, cyano, C<sub>1</sub>-C<sub>4</sub> alkylamino, diloweralkylamino or C<sub>1</sub>-C<sub>4</sub> alkylsulfonyl group; or phenyl optionally substituted with C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy or halogen; difluoromethoxy, trifluoromethoxy, 1,1,2,3-tetrafluoroethoxy, C<sub>3</sub>-C<sub>8</sub> straight or branched alkenyloxy optionally substituted with one to three halogens, or C<sub>3</sub>-C<sub>8</sub> straight or branched alkenyloxy optionally substituted with one to three halogens;

and, when taken together, Y and Z may form a ring in which YZ are represented by -(CH<sub>2</sub>)<sub>n</sub>-, -(CH)<sub>n</sub>-, where n is an integer of 3 or 4, and when A is N or N→O YZ may also be -(CH<sub>2</sub>)<sub>2</sub>-Q- or -(CH)<sub>2</sub>-Q-, wherein Q is oxygen or sulfur, with the proviso that X is hydrogen;

R<sub>1</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl;

R<sub>2</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl or C<sub>3</sub>-C<sub>6</sub> cycloalkyl; and when R<sub>1</sub> and R<sub>2</sub> are taken together with the carbon to which they are attached they may represent C<sub>3</sub>-C<sub>6</sub> cycloalkyl optionally substituted with methyl.

Acids of formula I may be formulated as aqueous solutions of a water soluble salt of the acid, as they have limited solubility in non-protic organic solvents. The preparation of organic solvent emulsifiable compositions of formula I acids by utilizing C<sub>8</sub> to C<sub>22</sub> tertiary alkylamine salts of the acid which are soluble in organic solvents have been described in the literature.

Salts of formula I compounds are soluble in water and can be used as a dilute aqueous spray (EP-A-0 041 624).

While aqueous solutions of imidazolinyl acid salts are suitable for a variety of general herbicidal used, it has been found that upon aging for extended periods of time and/or exposure to elevated temperatures, that aqueous solutions of these acid salts exhibit loss of potency.

It is an object of this invention to provide novel aqueous compositions of water soluble formula I herbicidal acid salts which are physically and chemically stable for extended periods of time over a wide range of temperatures.

## SUMMARY OF THE INVENTION

The present invention is novel aqueous herbicidal compositions comprising on a weight basis 1.0% to

45% of a water soluble salt of a formula I imidazolinone acid; 0 to 20% of urea; 0% to 30% of a nonionic surfactant; and sufficient water to total 100% which have been buffered with a sufficient amount of acid to have an initial pH in a range of about from pH 6 to pH 8.5.

## 5 DETAILED DESCRIPTION OF THE INVENTION

It has been found that the long term stability and stability at elevated temperatures of aqueous compositions of water soluble acid salts of formula I imidazolinyl salts is improved by stabilizing the initial pH of the aqueous compositions with sufficient amounts of a mineral or water soluble organic acid to a pH  
10 about equal to the pH of the formula I acid which is normally in a range of about pH 6 to pH 8.5 and preferably pH 7 to pH 7.5. Preferred acids for use in the compositions of the invention include hydrochloric acid, phosphoric acid, sulfuric acid, acetic acid, propionic acid and the like with acetic acid being most preferred.

Additionally it has been found the addition of urea as an antifreezing agent to aqueous compositions of  
15 the invention in amounts of from 15% to 20% on a weight basis also improves the freeze-thaw characteristics of the compositions of the present invention, in that any solids which form during freezing readily redissolve on standing. The use of urea to improve cold stabilization of aqueous pyrazolium salt compositions is known in the art. Surfactants suitable for use in the compositions of this invention are in general non-ionic surfactants with polyoxyethylene glycols, polyoxyethylene sorbitan monolaurates and  
20 dialkylphenoxypolyethylinoxyethanols being preferred.

Salts of formula I compounds which find utility in the compositions of this invention are in general those which have sufficient water solubility to provide about 1% to 50% aqueous solution of the acid as the salt, with sodium, potassium, ammonium and water soluble organic ammonium being preferred and sodium, potassium, ammonium and isopropylammonium being most preferred.

25 The invention is further illustrated by the following non-limiting examples.

### EXAMPLE 1

#### Preparation of aqueous herbicidal compositions of imidazolinyl acid salts

30 The formula I imidazolinyl acids listed in Table I below are added at ambient temperature to a stirred water solution containing 1.0 to 1.10 equivalents of the desired base and the desired quantity of urea and surfactant. The resulting mixture is agitated until complete solution of the acid is obtained. The pH of the solution is adjusted to the desired pH range by the addition of mineral or organic acid to the stirred solution followed by the addition of water to obtain the desired final concentration of ingredients.

35 Utilizing the above procedures yields the compositions listed in the Table I below:

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50

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TABLE I

| Formula I<br>acid                                                                           | Salt                                       | Compo-<br>sition | % w/w                 |                                                                    |      |                            |
|---------------------------------------------------------------------------------------------|--------------------------------------------|------------------|-----------------------|--------------------------------------------------------------------|------|----------------------------|
|                                                                                             |                                            |                  | Active<br>ingredient* | (Surfactant)                                                       | Urea | (Acid) Water pH            |
| 2-(4-isopropyl-<br>4-methyl-5-oxo-<br>2-imidazolin-2-<br>yl)quinoline-3-<br>carboxylic acid | ammonium<br>(1.3% w/w<br>NH <sub>3</sub> ) | 1a               | 16.46                 | 1.0 (poly-<br>oxyethylene<br>sorbitan<br>monolaurate,<br>20 MEO**) | 15.0 | 0.7 60.81 7.75<br>(acetic) |
|                                                                                             |                                            |                  | 17.13                 | 1.0 (poly-<br>oxyethylene<br>sorbitan<br>monolaurate,<br>20 MEO)   | 15.0 | 0.7 61.47 7.54<br>(acetic) |

Table I (Continued)

% w/w

| Formula I<br>acid | Salt | Compo-<br>sition | Active<br>ingredient* | (Surfactant) | Urea | (Acid)          | Water | pH   |
|-------------------|------|------------------|-----------------------|--------------|------|-----------------|-------|------|
|                   |      | c                | 17.06                 | -            | -    | 0.7<br>(acetic) | 76.93 | 7.56 |
|                   |      | d                | 18.8                  | -            | -    | 0.7<br>(acetic) | 73.94 | 7.60 |
|                   |      | e                | 19.32                 | -            | -    | 0.7<br>(acetic) | 73.15 | 7.2  |
|                   |      | f                | 19.67                 | -            | -    | 0.7<br>(acetic) | 73.02 | 8.0  |
|                   |      | g                | 19.11                 | -            | -    | 0.7<br>(acetic) | 72.89 | 8.3  |
|                   |      | h                | 18.32                 | -            | -    | 0.7<br>(acetic) | 72.01 | 9.2  |

TABLE I (Continued)

| Formula I<br>acid                                                        | Salt                  | Compo-<br>sition | Active<br>ingredient* | % w/w                                                   |      |        |          |
|--------------------------------------------------------------------------|-----------------------|------------------|-----------------------|---------------------------------------------------------|------|--------|----------|
|                                                                          |                       |                  |                       | (Surfactant)                                            | Urea | (Acid) | Water pH |
| 2-(4-isopropyl-<br>4-methyl-5-oxo-<br>2-imidazolyl)-2-<br>nicotinic acid | isopropyl<br>ammonium | 2a               | 22.57                 | 28.0 (poly-<br>ethoxylated<br>nonylphenol,<br>8-14 MEO) | -    | -      | 42.0 6.0 |
|                                                                          |                       |                  | 22.57                 | 28.0 (poly-<br>ethoxylated<br>nonylphenyl,<br>8-14 MEO) | -    | (HCl)  | 42.0 7.0 |
|                                                                          | c                     | c                | 22.57                 | 28.0 (poly-<br>ethoxylated<br>nonylphenyl,<br>8-14 MEO) | -    | -      | 42.0 8.5 |
|                                                                          |                       |                  | 26.3                  | -                                                       | -    | (HCl)  | 65.3 8.0 |
|                                                                          | e                     | e                | 22.57                 | 28.0 (poly-<br>ethoxylated<br>nonylphenyl<br>8-14 MEO)  | -    | -      | 42.6 7.5 |

TABLE I (Continued)

% w/w

| Formula I<br>acid                                                                        | Salt     | Compo-<br>sition | Active<br>ingredient* | (Surfactant) | Urea | (Acid)   | Water | pH   |
|------------------------------------------------------------------------------------------|----------|------------------|-----------------------|--------------|------|----------|-------|------|
|                                                                                          |          | f                | 48.6                  | -            | -    | -        | 42.6  | 7.5  |
|                                                                                          |          | g                | 43.3                  | -            | -    | -        | 42.3  | 7.0  |
|                                                                                          |          | h                | 45.0                  | -            | -    | -        | 41.2  | 8.0  |
|                                                                                          |          | i                | 50.0                  | -            | -    | -        | 34.7  | 8.5  |
| 2-(4-isopropyl-<br>4-methyl-5-oxo-<br>2-imidazolin-2-<br>yl) 5-methyl-<br>nicotinic acid | ammonium | 3a               | 21.8                  | (-)          | -    | (acetic) | 70.0  | 7.0  |
|                                                                                          |          | b                | 21.8                  | (-)          | -    | (acetic) | 70.0  | 9.0  |
|                                                                                          |          | c                | 21.9                  | (-)          | -    | (acetic) | 70.0  | 9.0  |
|                                                                                          |          | d                | 22.0                  | (-)          | -    | (acetic) | 68.6  | 10.0 |

TABLE I (Continued)

| Formula I<br>acid                                                                         | Salt     | Compo-<br>sition | % w/w                 |              |      |                 | pH    |
|-------------------------------------------------------------------------------------------|----------|------------------|-----------------------|--------------|------|-----------------|-------|
|                                                                                           |          |                  | Active<br>ingredient* | (Surfactant) | Urea | (Acid)          | Water |
| 5-ethyl-2-(4-<br>isopropyl-4-<br>methyl-5-oxo-2-<br>imidazolin-2-<br>yl)nicotinic<br>acid | ammonium | 4a               | 22.8                  | (-)          | -    | 0.5<br>(acetic) | 71.2  |
|                                                                                           |          | b                | 21.8                  | (-)          | -    | 1.4<br>(acetic) | 69.5  |
|                                                                                           |          | c                | 22.6                  | (-)          | -    | 0.9<br>(acetic) | 69.0  |
|                                                                                           |          | d                | 20.3                  | (-)          | -    | 3.7<br>(acetic) | 65.9  |
|                                                                                           |          | e                | 25.0                  | (-)          | 20.0 | 0.3<br>(acetic) | 47.7  |
|                                                                                           |          |                  |                       |              |      |                 | 7.1   |

\*Calculated as the % free acid

\*\*NEO is moles of ethylene oxide

**EXAMPLE 2**

Stability of aqueous herbicidal compositions

Compositions prepared in Example 1 above are stored at 25°C, 37°C and 45°C. Samples are

withdrawn and the weight percent decomposition of the active formula I herbicide determined. The results of these experiments which are summarized in Table II below demonstrate the improvement in stability of aqueous compositions which have their initial pH adjusted and stabilized by the addition of acid.

TABLE II

| Weight % decomposition |      |       |        |       |        |       |        |
|------------------------|------|-------|--------|-------|--------|-------|--------|
| Composition            | pH   | 25° C |        | 37° C |        | 45° C |        |
|                        |      | % dec | months | % dec | months | % dec | months |
| 1a                     | 7.75 | 0.2   | 12.0   | 21.0  | 12.0   | 6.5   | 3.0    |
| b                      | 7.54 | 3.8   | 12.0   | 24.0  | 12.0   | 12.4  | 3.0    |
| c                      | 7.56 | 7.8   | 24.0   | 16.0  | 12.0   | 3.5   | 3.0    |
| d                      | 9.60 | 0.3   | 12.0   | 0.3   | 12.0   | 4.5   | 3.0    |
| e                      | 7.2  | 1.5   | 6.0    | -     | -      | 5.2   | 3.0    |
| f                      | 8.0  | -     | -      | -     | -      | 4.1   | 3.0    |
| g                      | 8.3  | -     | -      | -     | -      | 29.2  | 3.0    |
| h                      | 9.2  | -     | -      | -     | -      | 87.0  | 3.0    |
| 2a                     | 6.0  | 2.0   | 12.0   | 5.0   | 12.0   | 1.9   | 3.0    |
| b                      | 7.0  | 0.2   | 12.0   | 4.0   | 12.0   | 1.8   | 3.0    |
| c                      | 8.5  | 10.3  | 18.0   | 7.0   | 12.0   | 16.3  | 3.0    |
| d                      | 8.0  | 0.2   | 12.0   | 9.0   | 12.0   | 5.0   | 3.0    |
| e                      | 7.5  | 2.8   | 24.0   | 5.0   | 12.0   | 2.7   | 3.0    |
| f                      | 6.0  | 0.3   | 24.0   | 0.8   | 12.0   | 0.0   | -      |
| g                      | 7.0  | 1.5   | 24.0   | 5.0   | 12.0   | 1.2   | 3.0    |
| h                      | 8.0  | 11.7  | 24.0   | 20.8  | 12.0   | 11.0  | 3.0    |
| i                      | 8.5  | 23.4  | 24.0   | 35.9  | 12.0   | 18.5  | 3.0    |
| 3a                     | 7.0  | 0.3   | 6.0    | 3.7   | 6.0    | 3.5   | 3.0    |
| b                      | 8.0  | 4.7   | 6.0    | 15.9  | 6.0    | 12.7  | 3.0    |
| c                      | 9.0  | 14.6  | 6.0    | 53.0  | 6.0    | 44.7  | 3.0    |
| d                      | 10.0 | 29.7  | 6.0    | 87.5  | 6.0    | 82.6  | 3.0    |
| 4a                     | 6.5  | 0.3   | 18.0   | 39.0  | 12.0   | 3.4   | 3.0    |
| b                      | 7.0  | 1.0   | 18.0   | 7.0   | 12.0   | 4.0   | 3.0    |
| c                      | 7.4  | 1.9   | 12.0   | 6.3   | 12.0   | 5.3   | 3.0    |
| d                      | 8.0  | 13.1  | 18.0   | 31.5  | 12.0   | 11.7  | 3.0    |
| e                      | 7.0  | 0.0   | 12.0   | 9.4   | 12.0   | 3.8   | 3.0    |

**EXAMPLE 3**Effect of urea on redissolving precipitated solids

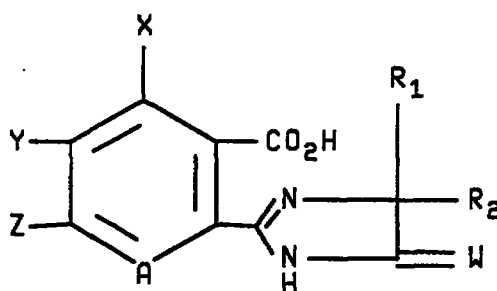
Compositions prepared by the procedure of Example 1 containing varying percentages of urea are cooled until precipitation of solids occurs. The samples are allowed to stand and are monitored until the temperature at which a complete solution is obtained and recorded. The results of these experiments are summarized in Table III below.

TABLE III

| Formula I acid                                                                         | % Urea w/v | Redissolution Temp °C |
|----------------------------------------------------------------------------------------|------------|-----------------------|
| 2-(4-isopropyl-4-methyl-5-oxo-2-yl)quinoline-3-carboxylic acid ammonium salt           | 0          | 18                    |
|                                                                                        | 6          | 5                     |
|                                                                                        | 10         | 3                     |
|                                                                                        | 15         | -5                    |
| 2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)-5-methyl nicotinic acid ammonium salt | 0          | -4                    |
|                                                                                        | 5          | -7                    |
|                                                                                        | 10         | -9                    |
|                                                                                        | 15         | -11                   |
| 5-ethyl-2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)nicotinic acid ammonium salt   | 0          | 12                    |
|                                                                                        | 10         | 9                     |
|                                                                                        | 15         | 9                     |
|                                                                                        | 20         | 1                     |

## Claims

1. A novel aqueous herbicidal composition comprising on a weight basis 1.0% to 45% of a water soluble formula I imidazolinone acid salt



( I )

wherein

A is CH; N or N→O;

W is oxygen or sulfur;

X is H, halogen, methyl or hydroxyl;

Y and Z are each hydrogen, halogen, C<sub>1</sub>-C<sub>6</sub> alkyl, hydroxyloweralkyl, C<sub>1</sub>-C<sub>6</sub> alkoxy, C<sub>1</sub>-C<sub>4</sub> alkylthio, phenoxy, C<sub>1</sub>-C<sub>4</sub> haloalkyl, nitro, cyano, C<sub>1</sub>-C<sub>4</sub> alkylamino, diloweralkylamino or C<sub>1</sub>-C<sub>4</sub> alkylsulfonyl group; or phenyl optionally substituted with C<sub>1</sub>-C<sub>4</sub> alkyl, C<sub>1</sub>-C<sub>4</sub> alkoxy or halogen; difluoromethoxy, trifluoromethoxy, 1,1,2,3-tetrafluoroethoxy, C<sub>3</sub>-C<sub>8</sub> straight or branched alkenyloxy optionally substituted with one to three halogens, or C<sub>3</sub>-C<sub>8</sub> straight or branched alkynyloxy optionally substituted with one to three halogens; and, when taken together, Y and Z may form a ring in which YZ are represented by -(CH<sub>2</sub>)<sub>n</sub>-, -(CH)<sub>n</sub>-, where n is an integer of 3 or 4, and when A is N or N→O YZ may also be -(CH<sub>2</sub>)<sub>2</sub>-Q- or -(CH<sub>2</sub>)-Q-, wherein Q is oxygen or sulfur, with the proviso that X is hydrogen;

R<sub>1</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl;

R<sub>2</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl or C<sub>3</sub>-C<sub>6</sub> cycloalkyl; and when R<sub>1</sub> and R<sub>2</sub> are taken together with the carbon to which they are attached they may represent C<sub>3</sub>-C<sub>6</sub> cycloalkyl optionally substituted with methyl;

0% to 20% urea; 0% to 30% nonionic surfactant and sufficient water to total 100% which has been

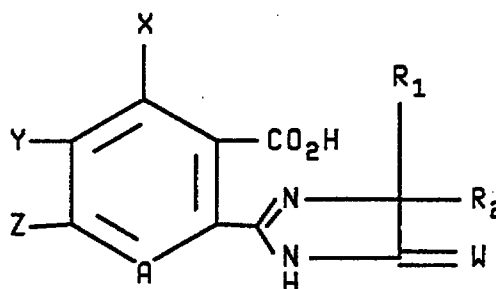


TABLE III

| Formula I acid                                                                         | % Urea w/v | Redissolution Temp °C |
|----------------------------------------------------------------------------------------|------------|-----------------------|
| 2-(4-isopropyl-4-methyl-5-oxo-2-yl)quinoline-3-carboxylic acid ammonium salt           | 0          | 18                    |
|                                                                                        | 6          | 5                     |
|                                                                                        | 10         | 3                     |
|                                                                                        | 15         | -5                    |
| 2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)-5-methyl nicotinic acid ammonium salt | 0          | -4                    |
|                                                                                        | 5          | -7                    |
|                                                                                        | 10         | -9                    |
|                                                                                        | 15         | -11                   |
| 5-ethyl-2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)nicotinic acid ammonium salt   | 0          | 12                    |
|                                                                                        | 10         | 9                     |
|                                                                                        | 15         | 9                     |
|                                                                                        | 20         | 1                     |

## Claims

1. A novel aqueous herbicidal composition comprising on a weight basis 1.0% to 45% of a water soluble formula I imidazolinone acid salt



( I )

wherein

A is CH; N or N→O;

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R<sub>1</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl;

R<sub>2</sub> is C<sub>1</sub>-C<sub>4</sub> alkyl or C<sub>3</sub>-C<sub>6</sub> cycloalkyl; and when R<sub>1</sub> and R<sub>2</sub> are taken together with the carbon to which they are attached they may represent C<sub>3</sub>-C<sub>6</sub> cycloalkyl optionally substituted with methyl;

0% to 20% urea; 0% to 30% nonionic surfactant and sufficient water to total 100% which has been

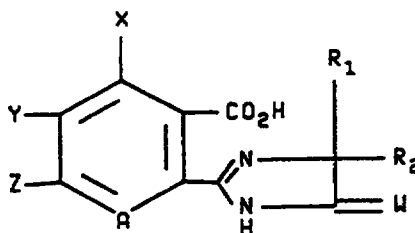


buffered with a sufficient amount of acid to have an initial pH in a range of about 6 to pH 8.5.

2. A composition according to Claim 1 wherein the acid used to adjust the pH is acetic acid; propionic acid; hydrochloric acid; phosphoric acid or sulfuric acid.
3. A composition according to Claim 2 wherein the acid is acetic acid.
4. A composition according to Claim 2 containing 15% to 20% by weight of urea.
5. A composition according to Claim 4 having an initial pH in a range of pH 7 to pH 7.5.
6. A composition according to Claim 5 wherein the formula I acid salt is ammonium 2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)quinoline-3-carboxylate.
7. A composition according to Claim 2 wherein the formula I acid salt is isopropylammonium 2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)nicotinate.
8. A composition according to Claim 5 wherein the formula I acid salt is ammonium 5-ethyl-2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)nicotinate.
9. A composition according to Claim 5 wherein the formula I acid salt is ammonium 2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)-5-methylnicotinate.

#### Revendications

1. Nouvelle composition herbicide aqueuse comprenant, sur une base pondérale, 1,0% à 45% d'un sel hydrosoluble d'un acide d'imidazolinone de formule I



( I )

dans laquelle

A est CH; N ou N→O;

W est un atome d'oxygène ou de soufre;

X est H, un atome d'halogène, ou un groupe méthyle ou hydroxyle;

Y et Z sont chacun des atomes d'hydrogène, d'halogène, ou des groupes alkyle en C<sub>1</sub>-C<sub>6</sub>, hydroxyalkyle inférieur, alcoxy en C<sub>1</sub>-C<sub>6</sub>, alkylthio en C<sub>1</sub>-C<sub>4</sub>, phénoxy, halogénoalkyle en C<sub>1</sub>-C<sub>4</sub>, nitro, cyano, alkylamino en C<sub>1</sub>-C<sub>4</sub>, dialkylamino inférieur ou alkylsulfonyl en C<sub>1</sub>-C<sub>4</sub>; ou des groupes phényle éventuellement substitués par un groupe alkyle en C<sub>1</sub>-C<sub>4</sub>, alcoxy en C<sub>1</sub>-C<sub>4</sub> ou halogéno; des groupes difluorométhoxy, trifluorométhoxy, 1,1,2,3-tétrafluoroéthoxy, alcényloxy en C<sub>3</sub>-C<sub>8</sub> linéaire ou ramifié, éventuellement substitué par un à trois atomes d'halogène, ou alcynyloxy en C<sub>3</sub>-C<sub>8</sub> linéaire ou ramifié éventuellement substitué par un à trois atomes d'halogène;

et, lorsqu'ils sont pris conjointement, Y et Z peuvent former un noyau dans lequel YZ représente -(CH<sub>2</sub>)<sub>n</sub>-, -(CH)<sub>n</sub>-, où n est un nombre entier égal à 3 ou 4 et, lorsque A est N ou N→O, YZ peut être aussi -(CH<sub>2</sub>)<sub>2</sub>-Q- ou -(CH)<sub>2</sub>-Q-, où Q est un atome d'oxygène ou de soufre, à condition que X soit un atome d'hydrogène;

R<sub>1</sub> est un groupe alkyle en C<sub>1</sub>-C<sub>4</sub>;

R<sub>2</sub> est un groupe alkyle en C<sub>1</sub>-C<sub>4</sub> ou cycloalkyle en C<sub>3</sub>-C<sub>6</sub>; et, lorsque R<sub>1</sub> et R<sub>2</sub> sont pris

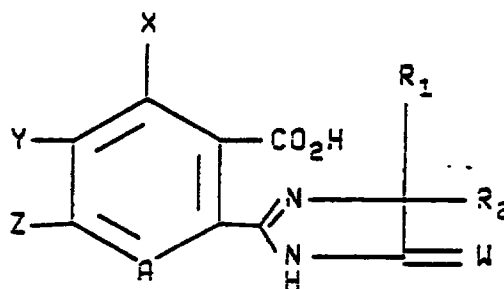


conjointement avec l'atome de carbone auquel ils sont fixés, ils peuvent représenter un groupe cycloalkyle en C<sub>3</sub>-C<sub>6</sub> éventuellement substitué par un groupe méthyle; 0 à 20% d'urée; 0% à 30% d'un tensioactif non ionique; et suffisamment d'eau, tamponnée avec une quantité suffisante d'un acide pour présenter un pH initial dans la gamme de pH d'environ 6 à 8,5, pour compléter à 100%.

2. Composition selon la revendication 1, dans laquelle l'acide utilisé pour ajuster le pH est l'acide acétique, l'acide propionique, l'acide chlorhydrique, l'acide phosphorique ou l'acide sulfurique.
3. Composition selon la revendication 2, dans laquelle l'acide est l'acide acétique.
4. Composition selon la revendication 2, contenant 15% à 20% en poids d'urée.
5. Composition selon la revendication 4, ayant un pH initial dans le domaine de pH 7 à pH 7,5.
6. Composition selon la revendication 5, dans laquelle le sel d'acide de formule I est le 2-(4-isopropyl-4-méthyl-5-oxo-2-imidazoline-2-yl)quinoléine-3-carboxylate d'ammonium.
7. Composition selon la revendication 2, dans laquelle le sel d'acide de formule I est le 2-(4-isopropyl-4-méthyl-5-oxo-2-imidazoline-2-yl)nicotinate d'isopropylammonium.
8. Composition selon la revendication 5, dans laquelle le sel d'acide de formule I est le 5-éthyl-2-(4-isopropyl-4-méthyl-5-oxo-2-imidazoline-2-yl)nicotinate d'ammonium.
9. Composition selon la revendication 5, dans laquelle le sel d'acide de formule I est le 2-(4-isopropyl-4-méthyl-5-oxo-2-imidazoline-2-yl)-5-méthylnicotinate d'ammonium.

#### Patentansprüche

1. Neue wässrige herbizide Zusammensetzung, umfassend auf Gewichtsbasis 1,0 bis 45 % eines wasserlöslichen Imidazolinonsäuresalzes der Formel I:



( I )

wobei

A für CH; N oder N→O steht;

W für Sauerstoff oder Schwefel steht;

X für H, Halogen, Methyl oder Hydroxyl steht;

Y und Z sind jeweils Wasserstoff, Halogen, C<sub>1-6</sub>-Alkyl, Hydroxyniederalkyl, C<sub>1-6</sub>-Alkoxy, C<sub>1-4</sub>-Alkylthio, Phenoxy, C<sub>1-4</sub>-Haloalkyl, Nitro, Cyano, C<sub>1-4</sub>-Alkylamino, Diniederalkylamino oder C<sub>1-4</sub>-Alkylsulfonylgruppe; oder Phenyl, gegebenenfalls substituiert mit C<sub>1-4</sub>-Alkyl, C<sub>1-4</sub>-Alkoxy oder Halogen; Difluormethoxy, Trifluormethoxy, 1,1,2,3-Tetrafluorethoxy, geradkettiges oder verzweigtes C<sub>3-8</sub>-Alkenyloxy, gegebenenfalls substituiert mit 1 bis 3 Halogenen, oder geradkettiges oder verzweigtes C<sub>3-8</sub>-Alkinyloxy, gegebenenfalls substituiert mit 1 bis 3 Halogenen;



und wenn sie zusammengefaßt sind, können Y und Z einen Ring bilden, in dem YZ für  $-(CH_2)_n-$ ,  $-(CH)_n-$  steht, wobei n eine ganze Zahl von 3 oder 4 ist und falls A für N oder  $N \rightarrow O$  steht, kann YZ auch  $-(CH_2)_2-Q$  oder  $-(CH)_2-Q$  sein, wobei Q für Sauerstoff oder Schwefel steht, mit der Maßgabe, daß X Wasserstoff ist;

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 $R_1$ steht für  $C_{1-4}$ -Alkyl $R_2$ steht für  $C_{1-4}$ -Alkyl oder  $C_{3-6}$ -Cycloalkyl; und falls  $R_1$  und  $R_2$  zusammengefaßt sind mit dem Kohlenstoff, an das sie geknüpft sind, können sie für  $C_{3-6}$ -Cycloalkyl stehen, das gegebenenfalls mit Methyl substituiert ist;

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0 bis 20 % Harnstoff; 0 bis 30 % nicht-ionisches Surfactans und ausreichend Wasser, um die Gesamtmenge auf 100 % zu bringen, das gepuffert wurde mit einer ausreichenden Menge an Säure, um einen anfänglichen pH im Bereich von etwa 6 bis pH 8,5 aufzuweisen.

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2. Zusammensetzung gemäß Anspruch 1, wobei die zur Einstellung des pH verwendete Säure Essigsäure, Propionsäure, Chlorwasserstoffsäure, Phosphorsäure oder Schwefelsäure ist.

3. Zusammensetzung gemäß Anspruch 2, wobei die Säure Essigsäure ist.

4. Zusammensetzung gemäß Anspruch 2, enthaltend 15 bis 20 Gew.-% Harnstoff.

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5. Zusammensetzung gemäß Anspruch 4 mit einem anfänglichen pH in einem Bereich von pH 7 bis pH 7,5.

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6. Zusammensetzung gemäß Anspruch 5, wobei das Säuresalz der Formel I Ammonium-2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)chinolin-3-carboxylat ist.

7. Zusammensetzung gemäß Anspruch 2, wobei das Säuresalz der Formel I Isopropylammonium-2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)nikotinat ist.

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8. Zusammensetzung gemäß Anspruch 5, wobei das Säuresalz der Formel I Ammonium-5-ethyl-2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)nikotinat ist.

9. Zusammensetzung gemäß Anspruch 5, wobei das Säuresalz der Formel I Ammonium-2-(4-isopropyl-4-methyl-5-oxo-2-imidazolin-2-yl)-5-methylnikotinat ist.

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