NAPHTHALENEACETIC ACID

Task 3: Environmental Fate Profile

Contract No. 68-01-5830

Final Report

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SUBMITTED TO:

Environmental Protection Agency
Arlington, Virginia 22202

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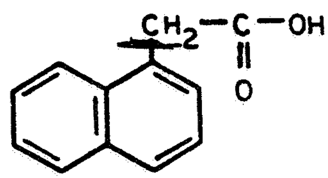
NAPHTHALENEACETIC ACID

TASK 3

Naphthaleneacetic acid, NAA 800,
Fruitone N, Rootone, Transplantone,
Tre-Hold



1-Naphthaleneacetic acid

Environmental Fate Profile

Available data are insufficient to fully assess the environmental fate of naphthaleneacetic acid (NAA).

Aspergillus niger was implicated as metabolizing NAA to 5-hydroxy NAA. Other possible products are the 4- and 6-hydroxy NAA isomers, as well as other phenolic or naphtholic compounds. Hydroxylation thus appears to be a major route of degradation of NAA.

A coliform bacterium and two animal pathogens (*Staphylococcus aureus* and human type tubercle bacilli) are inhibited by NAA at 50-300 ppm, whereas avian type tubercle bacilli are not inhibited by NAA at 50 ppm. A yeast, *Saccharomyces cerevisiae*, is inhibited 13-58% by NAA at 100-500 ppm. In addition, large-cell mutants result from the induction of polyploidy. Two mutants of *Neurospora crassa* are inhibited 12-68% by NAA at 10-50 ppm, but a wild type control strain was not studied. An alga, *Chlorella pyrenoidosa*, is inhibited 40-80% by NAA at 46-372 ppm. Thus, a wide range of microorganisms is inhibited by NAA at 10-500 ppm which are concentrations far in excess of the highest expected level in the soil (0.08 ppm). Most studies dealt with mutants, animal pathogens, or soil microorganisms of questionable importance. None of the studies reported the source and purity of the NAA used.

In summary, although very little data are available to form a profile of the environmental fate of NAA, 5-hydroxy NAA is a suspected fungal metabolite of NAA. At very high concentrations, NAA is capable of inhibiting bacteria, fungi, and algae and also of inducing polyploid mutants. The available data suggest that currently approved NAA application rates will not have an effect on soil microorganisms.

Data Gaps

The submitted studies are not sufficient to assess the fate of NAA in the environment. The following data gaps have been identified.

Type of Data	Guideline Section
Hydrolysis	163.62-7(b)
Naphthaleneacetamide	
NAA	
NAA-ammonium salt	
NAA-ethyl ester	
NAA-potassium salt	
NAA-sodium salt	
Activated sludge metabolism	163.62-8(g)
Naphthaleneacetamide	
NAA	
NAA-ammonium salt	
NAA-ethyl ester	
NAA-potassium salt	
NAA-sodium salt	

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Photolysis	163.62-7(c)
Soil metabolism	163.62-8(b,c)
Microbiological metabolism	
• Effects of microbes on NAA	163.62-8(f)(2)
• Effects of NAA on microbes	163.62-8(f)(3)
Leaching	163.62-9(b)
Volatility	163.62-9(c)
NAA	
Adsorption/desorption	163.62-9(d)
Terrestrial field dissipation	
• Tree fruit and nut crop uses	163.62-10(b)(2)

Naphthaleneacetamide
8.4% ai wettable powder
0.176 lb/gal soluble concentrate/liquid

NAA
0.2% ai dust
3.5% ai wettable powder
0.106 lb/gal emulsifiable concentrate
0.28 lb/gal soluble concentrate/liquid

NAA-ammonium salt
1.76 lb/gal soluble concentrate/liquid

NAA-potassium salt
1.76 lb/gal soluble concentrate/liquid

NAA-sodium salt
7.11% ai wettable powder
98% ai crystalline
3.5% ai soluble concentrate/solid

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- Domestic outdoor, parks, ornamental and turf uses — 163.62-10(b)(4)

  NAA

  0.12% ai soluble concentrate/liquid

  NAA-ammonium salt

  1.76 lb/gal soluble concentrate/liquid

  NAA-ethyl ester

  1% ai ready to use

  1% ai pressurized liquid

  NAA-sodium salt

  7.11% ai wettable powder

Fish accumulation — 163.62-11(d)

Label Restrictions

Current label restrictions warn against the use of NAA (acid) in combination with insecticides or fungicides. NAA-potassium salt is not to be used in the greenhouse.

References

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