Biological Sciences : Ecology

Characterization of the Ecotoxicity of Five Biodegredable Polymers Under Consideration by NAVAIR for Use in Chaff-Dispensing Systems

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Abstract: The accumulation of discarded **chaff** dispenser styrene piston and endcaps in the environment is a concern of the Department of Defense. Five biodegradable materials are being considered for use in the manufacture of degradable **chaff** cartridges pistons and endcaps. Relative degradability of the materials is being evaluated by measuring total organic carbon (TOC) released by the materials overtime in water. Environmental toxicity testing of the dissolution products from the materials is being conducted in 2 terrestrial plant species and 7 species of aquatic organisms. Dissolution products from 4 of the biopolymers were found to be toxic to aquatic organisms with LC50s and LOELs ranging between 1.24 - 731.30 mg TOC/1. The dissolution products did not inhibit seed germination of Brassica rappa or Lepidium sativum. Average shoot length of B. rappa seedlings treated with BAK2195/CP1000 (90:10) and BIPOL D411GN were 25- 40% shorter as compared with negative controls ($p < 0.05$). Average shoot length of L. sativum seedings treated with BAK2195/CP1000 (90:10) were 10-20% shorter than controls ($p < 0.05$)). Information gained from these studies will be used making decisions on which (if any) of the polymers will be suitable for the construction of biodegradable **chaff** cartridges, pistons, and endcaps.

Limitations:	APPROVED FOR PUBLIC RELEASE
Description:	Final rept.
Pages:	67
Report Date:	21 MAR 2001
Report Number:	A677993

Keywords relating to this report:

- AQUATIC ORGANISMS
- BIODEGRADATION
- CHAFF DISPENSERS
- ECOLOGY
- ELECTRONIC COUNTERMEASURES
- POLYMERS
- TOXICITY

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