

**A PRELIMINARY ENVIRONMENTAL RISK ASSESSMENT OF BOA
[2(3H)-BENZOXAZOLINONE]: ACUTE AND CHRONIC TOXICITY
TESTS ON MICROALGAE.**

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Economic and environmental constraints of crop production systems have stimulated interest in alternative weed management strategies. Allelopathy offers potential for selective biological weed management through the production and release of allelochemicals. The allelochemical BOA (2(3h)-benzoxazolinone), released mainly by Graminaceae, is a strong inhibitor of germination and seedling growth of several dicot- and monocotyledonous plants species. It could be used as natural weed control, safer for the environment. It has been demonstrated that rye residues maintained on the soil surface release DIBOA (2,4-dihydroxy-1,4(2H)-benzoxazin-3-one) and the breakdown product BOA, both of which reduce weed growth. But it is necessary to test the environmental toxicity and compare it with the toxicity of the common herbicides. Specific procedures for conducting environmental risk assessment on allelochemicals need to be developed. However, bioassays on microalgae represent the first step to be carried out, since these organisms account for about the half of the global primary production. Virtually, all the aquatic organisms depend on algae for their survival.

Chronic and acute toxicity of BOA and two commercial herbicides (LINURON and PATORAN) were tested. Standard methods were used: photosynthesis bioassay on *Chlamydomonas reinhardtii* for acute toxicity and ISO8692 (using *Pseudokirkneriella subcapitata* as test organism) for chronic one. The ISO8692 method was extended to *Synechococcus leopoliensis* and *Cyclotella menegheniana*, to know the effect on three species belonging to the three main microalgae groups (Cianophyceae, Bacillariophyceae and Chlorophyceae) living in fresh water environments. The toxicity of common herbicides tested was from 10 to 10³ folds lower than the allelochemical (BOA) one. Despite more test should be make, the results found suggest the possibility to develop a biological weed management safer for the environment, to enhance the sustainability of agriculture.