



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

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OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: Pseudomonas syringae. Final progress report on 1987 field test and amended Experimental Use Permit application from Steven Lindow of the University of California (I.D. Nos. 55269-EUP-1 and -2; Record Nos. 213443, 213444, 214088, and 214089; RCB Nos. 3308, 3309, 3329, and 3330)

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Introduction

Two Ice Nucleation Negative (INA⁻) strains of Pseudomonas syringae (Cit7del1b and TLP2del1) have been subjected to field testing by Dr. Steven Lindow of the University of California under Experimental Use Permit Nos. 55269-EUP-1 and -2 announced at FR 51(120):22858 (Mon., 6/23/86). The first progress report was reviewed by W. Hazel (3/9/88). The subject of this memorandum is the final progress report, transmitted 1/21/87, of the extensive monitoring program required in the FR notice.

Results of the 1987 Monitoring Program

INA⁻ bacteria occurred at <3000 cells/g fresh wt on "trap" bean plants in the buffer zone with the highest populations occurring 1-3 m from the experimental plot edges; within 16 hr of treatment, INA⁻ cells were nondetectable (<10 cells/g fresh wt). Leaves of treated potato plants bore INA⁻ cells at 10⁴-10⁷ cells/g fresh wt but after mid-June, they declined to nondetectable levels (<10 cells/g fresh wt).

g fresh wt). In soil, INA⁻ bacteria were nondetectable (<10 cells/g fresh wt) from day 0 in untreated plots and after 1 week in treated plots. INA⁻ bacteria were nondetectable on plants 20-100 m outside the barren buffer zone, on insects collected inside and outside the treatment area, and on harvested tubers.

Populations of INA⁺ rifampicin-resistant P. syringae were inhibited on potato leaves for several weeks after treatment with INA⁻ strains. During an early season (5/21/87) frost event (-3 C), 39-43% of control plants were damaged whereas 17-21% of INA⁻-treated plants were damaged. After a late season (9/15/87) frost event (-5 C), >2x as many leaves/plant remained undamaged on INA⁻-treated potato plants than on control plants and 3-4x as many were undamaged compared with plants treated with both INA⁺ strains. Potato (tuber) yield was not significantly different regardless of treatment.

Amended EUP Application

The University of California proposes the following amendments to their EUP:

- o To select a different site at the Tulelake Experiment Station, University of California.
- o To eliminate monitoring of INA⁻ bacteria on insects, soil outside the experimental plot, and bodies of water since, in the 1987 field trials, bacteria were not detected in these matrices.
- o To reduce the number and/or frequency of monitoring of potato leaves, soil inside the plots, and airborne deposition.
- o Extension of the EUP from 5/12/89 to 5/12/90 since testing did not commence until 1987, the second year of the 3-year EUP.

Official Conclusions

Until RCB is in a position to perform secondary review at the senior level in the microbial area, the Branch will officially comment and make recommendations and conclusions only on issues directly related to chemistry. Other scientific comments will be provided but do not represent a final Branch position. RCB is, in effect, allowing SIMS or EEB to perform this review function. In this case, there are no official conclusions to be drawn because the field trials will terminate in crop destruction.

Unofficial Conclusions

No unexpected results were reported. The submitted monitoring data do not indicate detectable escape from the test site. There is no reasonable cause to recommend against further field testing. Further, we have no objection to the proposed EUP amendments.

cc: Fred Betz (SIMS), Roy Sjöblad (TOX), Bob Pilsucki (EEB), EAB, PMSD/ISB