

APPENDIX I: OPEN LITERATURE (ECOTOX) - STUDIES THAT PASSED OPP/EFED SCREENING

ALDICARB

ECOTOX Papers that Passed EFED's Screen

Papers discussed in this assessment (either quantitatively or qualitatively) are indicated in BOLD type.

Abivardi, C. and Altman, J. (1978). Effect of Cycloate and Aldicarb Alone and in Combination on Growth of Three Sugar Beet Species (Beta spp.). *Weed Sci.* 26: 161-162.

Barahona, M. V. and Sanchez-Fortun, S. (1999). Toxicity of Carbamates to the Brine Shrimp *Artemia salina* and the Effect of Atropine, BW284c51, iso-OMPA and 2-PAM on Carbaryl Toxicity. *Environ.Pollut.* 104: 469-476.

Boag, B. (1985). Effect of Pesticides on Longidorus elongatus and the Yield of Swedes. *Tests Agrochem.Cultiv.* 6: 32-33.

Boyd, C. A., Weiler, M. H., and Porter, W. P. (1990). Behavioral and Neurochemical Changes Associated with Chronic Exposure to Low-Level Concentration of Pesticide Mixtures. *J.Toxicol.Environ.Health* 30: 209-221.

Brackup, I. and Capone, D. G. (1985). The Effect of Several Metal and Organic Pollutants on Nitrogen Fixation (Acetylene Reduction) by the Roots and Rhizomes of *Zostera marina* L. *Environ.Exp.Bot.* 25(2): 145-151.

Carter, F. L. (1971). In Vivo Studies of Brain Acetylcholinesterase Inhibition by Organophosphate and Carbamate Insecticides in Fish. *Ph.D.Thesis, Louisiana State Univ.and Agric.and Mechanical College; Diss.Abstr.Int.B Sci.Eng.* 32(5):2772-2773 (*Publ in Part As* 942) 202 p.

Clements, R. O., Bentley, B. R., and Murray, P. J. (1992). Differential Reaction of Newly-Sown Ryegrass (*Lolium* spp.) Cultivars to Insecticide Treatments. *Tests Agrochem.Cultiv.* 13: 78-79.

Cole, D. F. and Dexter, A. G. (1986). Effect of Multiple Pesticide Treatments on Sugar Beet Yield and Quality. *J.Am.Soc.Sugar Beet Technol.* 23: 109-115.

Coppage, D. L. (1977). Anticholinesterase Action of Pesticidal Carbamates in the Central Nervous System of Poisoned Fishes. *In: J.F.Vernberg (Ed.), Symp.Physiological Responses of Marine Biota to Pollutants, Academic Press, New York, NY* 93-102.

Edmiston, C. E. J., Goheen, M., Malaney, G. W., and Mills, W. L. (1985). Evaluation of Carbamate Toxicity: Acute Toxicity in a Culture of *Paramecium multimicronucleatum* upon Exposure to Aldicarb, Carbaryl, and Mexacarbate as Measured by Warburg Respirometry and Acute Plate Assay. *Environ.Res.* 36: 338-350.

Edmiston, C. E. Jr., Goheen, M., and Malaney, G. W. (1984). Environmental Assessment of Carbamate Toxicity: Utilization of the Coomassie Blue G Soluble Protein Assay as an Index of Environmental Toxicity. *Hazard.Waste* 1: 205-215.

El-Alfy, A. T., Grisle, S., and Schlenk, D. (2001). Characterization of Salinity-Enhanced Toxicity of Aldicarb to Japanese Medaka: Sexual and Developmental Differences. *Environ.Toxicol.Chem.* 20: 2093-2098.

El-Alfy, A. T. and Schlenk, D. (2002). Effect of 17beta-Estradiol and Testosterone on the Expression of Flavin-Containing Monooxygenase and the Toxicity of Aldicarb to Japanese medaka, *Oryzias latipes*. *Toxicol.Sci.* 68: 381-388.

El-Wakil, H. B. and Radwan, M. A. (1991). Biochemical Study on the Terrestrial Snail, *Eubania vermiculata*

(Muller) Treated with Some Pesticides. *J.Environ.Sci.Health Part B* 26: 479-489.

Ellis, S. A., Clements, R. O., and Bale, J. S. (1986). The Effect of Aldicarb on Italian Ryegrass (*Lolium multiflorum*) Seeds and Seedlings. *Tests Agrochem.Cultiv.* 7: 122-123.

EPA/OTS (1992). Initial Submission: R/D Report Concerning Bluegill Toxicity Study with Temik Sulfoxide and Temik Sulfone with Cover Letter Dated 09/03/92. *EPA/OTS Doc.#88-920009384*.

Farage-Elawar, M. (1990). Effects of In Ovo Injection of Carbamates on Chick Embryo Hatchability, Esterase Enzyme Activity and Locomotion of Chicks. *J.Appl.Toxicol.* 10: 197-202.

Ferree, D. C. and Hall, F. R. (1978). Effects of Growth Regulators and Multiple Applications of Pesticides on Net Photosynthesis and Transpiration of Greenhouse-Grown Apple Trees. *J.Am.Soc.Hortic.Sci.* 103: 61-64.

Fisher, S. W. (1991). Changes in the Toxicity of Three Pesticides as a Function of Environmental pH and Temperature. *Bull.Environ.Contam.Toxicol.* 46: 197-202.

Fisher, S. W., Lydy, M. J., Barger, J., and Landrum, P. F. (1993). Quantitative Structure-Activity Relationships for Predicting the Toxicity of Pesticides in Aquatic Systems with Sediment. *Environ.Toxicol.Chem.* 12: 1307-1318.

Foran, J. A., Germuska, P. J., and Delfino, J. J. (1985). Acute Toxicity of Aldicarb, Aldicarb Sulfoxide, and Aldicarb Sulfone to *Daphnia laevis*. *Bull.Environ.Contam.Toxicol.* 35: 546-550 (OECDG Data File).

Foran, J. A., Miller, W. L., Doyan, S., and Krtausch, M. (1986). Temik Contamination in a Surface Water System and Its Potential Effect on a Daphnid Species in Florida. *Environ.Pollut.Ser.A* 40: 369-380.

French, J. B. Jr. and Porter, W. P. (1994). Energy Acquisition and Allocation in *Peromyscus maniculatus* Exposed to Aldicarb and Cool Temperatures. *Environ.Toxicol.Chem.* 13: 927-933.

Gallo, D., Merendino, A., Keizer, J., and Vittozzi, L. (1995). Acute Toxicity of Two Carbamates to the Guppy (*Poecilia reticulata*) and the Zebrafish (*Brachydanio rerio*). *Sci.Total Environ.* 171: 131-136.

Geiger, D. L., Brooke, L. T., and Call, D. J. (1990). Acute Toxicities of Organic Chemicals to Fathead Minnows (*Pimephales promelas*). *Ctr.for Lake Superior Environ.Stud., Univ.of Wisconsin-Superior, Superior, WI* 5: 332 p.

Gill, T. S., Pande, J., and Tewari, H. (1990). Enzyme Modulation by Sublethal Concentrations of Aldicarb, Phosphamidon, and Endosulfan in Fish Tissues. *Pestic.Biochem.Physiol.* 38: 231-244.

Gill, T. S., Pande, J., and Tewari, H. (1991). Hemopathological Changes Associated with Experimental Aldicarb Poisoning in Fish (*Puntius conchonius Hamilton*). *Bull.Environ.Contam.Toxicol.* 47: 628-633.

Guy, C. B. Jr., Helms, R. S., and Beaty, J. D. (1994). Rice Cultivar Response to Rice Herbicides and Simulated Rice Herbicide Drift to Sensitive Crops. *Ark.Agric.Exp.Stn.Res.Ser.* 439: 43-50.

Haque, A. and Ebing, W. (1983). Toxicity Determination of Pesticides to Earthworms in the Soil Substrate. *J.Plant Dis.Prot.(Z.Pflanzenkr.Pflanzensch.)* 90: 395-408 (OECDG Data File).

Hawkes, A. W., Brewer, L. W., Hobson, J. F., Hooper, M. J., and Kendall, R. J. (1996). Survival and Cover-Seeking Reponse of Northern Bobwhites and Mourning Doves Dosed with Aldicarb. *Environ.Toxicol.Chem.* V15 (9): 1538-1543.

- Heimbach, F. (1985). Comparison of Laboratory Methods, Using Eisenia foetida and Lumbricus terrestris, for the Assessment of the Hazard of Chemicals to Earthworms. *J. Plant Dis. Prot.* 92: 186-193 (OECDG Data File).
- Hill, E. F. and Camardese, M. B. (1986). Lethal Dietary Toxicities of Environmental Contaminants and Pesticides to Coturnix. *U.S. Fish Wildl Serv., Fish wildl Tech Rep No.2* 147 p.
- Hill, E. F. and Camardese, M. B. (1981). Subacute Toxicity Testing with Young Birds: Response in Relation to Age and Interest Variability of LC50 Estimates. In: D.W.Lamb and E.E.Kenaga (Eds.), *Avian and Mammalian Wildlife Toxicology, 2nd Conference, ASTM STP 757, Philadelphia, PA* 41-65.
- Hill, E. F. and Camardese, M. B. (1984). Toxicity of Anticholinesterase Insecticides to Birds: Technical Grade Versus Granular Formulations. *Ecotoxicol. Environ. Saf.* 8: 551-563.
- Hill, E. F., Heath, R. G., Spann, J. W., and Williams, J. D. (1975). Lethal Dietary Toxicities of Environmental Pollutants to Birds. *U.S. Fish and Wildlife Service, Special Scientific Report-Wildlife* 191: 1-61.
- Jackson, D. M. and Lam, J. J. Jr. (1989). Jalysus wickhami (Hemiptera: Berytidae): Toxicity of Pesticides Applied to the Soil or in the Transplant Water of Flue-Cured Tobacco. *J. Econ. Entomol.* 82: 913-918.
- Jacobson, R. M. and Thriugnanam, M. (1990). New Selective Systemic Aphicides. In: D.R.Baker, J.G.Fenyves, and W.K.Moberg (Eds.), *ACS (Am.Chem.Soc) Symp.Ser.No.443, Chapter 26, Synthesis and Chemistry of Agrichemicals, Washington, D.C.* 322-339.
- Johnson, R., Tietge, J., Stokes, G., and Lothenbach, D. (1993). The Medaka Carcinogenesis Model. In: Technical Report 9306, Compendium of the FY1988 & FY1989 Research Reviews for the Research Methods Branch, U.S.Army Biomedical Research & Development Lab., Ft.Detrick, Frederick, MD 147, 172 (U.S.NTIS AD-A272667).**
- Kallander, D. B., Fisher, S. W., and Lydy, M. J. (1997). Recovery Following Pulsed Exposure to Organophosphorus and Carbamate Insecticides in the Midge, Chironomus riparius. Arch. Environ. Contam. Toxicol. 33: 29-33.**
- Kimpinski, J., Johnston, H. W., and Sanderson, J. B. (1998). Effects of Carbathiin and Thiram with Propiconazole and Aldicarb on Grain Yield, and on Incidence of Root Rot, Leaf Blotch, and Root Lesion Nematode in Spring Wheat. *Can.J. Plant Pathol.* 20: 201-205.
- Klein, B. G., McCain, W. C., and Ehrlich, M. (1991). Morphometric Analysis of Rat Trigeminal Ganglion Cells and Their Vibrissa Follicle Nerve Axons Following Multiple Low-Dose Exposure to the Carbamate Insecticide Aldicarb. *J.Am. Coll. Toxicol.* 10: 555-568.
- Kumar, S. and Pant, S. C. (1984). Organal Damage Caused by Aldicarb to a Freshwater Teleost Barbus conchonius Hamilton. *Bull. Environ. Contam. Toxicol.* 33: 50-55 (OECDG Data File).
- Landau, M. and and Tucker, J. W. Jr. (1984). Acute Toxicity of EDB and Aldicarb to Young of Two Estuarine Fish Species. Bull. Environ. Contam. Toxicol. 33: 127-132.**
- Lydy, M. J., Bruner, K. A., Fry, D. M., and Fisher, S. W. (1990). Effects of Sediment and the Route of Exposure on the Toxicity and Accumulation of Neutral Lipophilic and Moderately Water-Soluble Metabolizable Compounds in the Midge, Chironomus riparius. In: W.G.Landis and W.H.Van der Schalie (Eds.), *Aquatic Toxicology and Risk Assessment, 13th Volume, ASTM STP 1096, Philadelphia, PA* 140-164.**
- Martin, N. A. (1986). Toxicity of Pesticides to Allolobophora caliginosa (Oligochaeta: Lumbricidae).

N.Z.J.Agric.Res. 29: 699-706.

Mateile, T. and Netscher, C. (1989). Control of Meloidogyne incognita on Cucumber by Small Quantities of Systemic Nematicides Applied at Seedling Stage. *Trop.Pest Manag.* 35: 107.

Mayer, F. L. J. and Ellersieck, M. R. (1986). Manual of Acute Toxicity: Interpretation and Data Base for 410 Chemicals and 66 Species of Freshwater Animals. *Resour.Publ.No.160, U.S.Dep.Interior, Fish Wildl.Serv., Washington, DC* 505 p. (USGS Data File).

Moore, M. T., Huggett, D. B., Gillespie, W. B. Jr., Rodgers, J. H. Jr., and Cooper, C. M. (1998). Comparative Toxicity of Chlordane, Chlorpyrifos, and Aldicarb to Four Aquatic Testing Organisms. *Arch.Environ.Contam.Toxicol.* 34: 152-157.

Palaniswamy, P., Subramaniam, T. R., and Thirumurthi, S. (1974). Influence of Some Systemic Insecticides Over the Germination, Growth and Yield of Okra (*Abelmoschus Esculentus* (L.) Moench). *Int Sym Fyt* 26: 885-892.

Palumbo, G., Bacchi, S., Coppolino, M. F., and Pantaleoni, G. C. (2001). Neurochemical and Behavioural Effects of Chronic Aldicarb Administration in Rats. *Pharmacol.Toxicol.* 89: 249-254.

Pant, J., Tewari, H., and Gill, T. S. (1987). Effects of Aldicarb on the Blood and Tissues of a Freshwater Fish. *Bull.Environ.Contam.Toxicol.* 38: 36-41.

Pantani, C., Pannunzio, G., De Cristofaro, M., Novelli, A. A., and Salvatori, M. (1997). Comparative Acute Toxicity of Some Pesticides, Metals, and Surfactants to *Gammarus italicus* Goedm. and *Echinogammarus tibaldii* Pink. and Stock. *Bull.Environ.Contam.Toxicol.* 59: 963-967.

Parker, B. L., Dewey, J. E., and Bache, C. A. (1970). Carbamate Bioassay Using *Daphnia magna*. *J.Econ.Entomol.* 63: 710-714.

Pickering, Q. H. and Gilliam, W. T. (1982). Toxicity of Aldicarb and Fonofos to the Early-Life Stage of the Fathead Minnow. *Arch.Environ.Contam.Toxicol.* 11: 699-702.

Porter, W. P., Green, S. M., Debbink, N. L., and Carlson, I. (1993). Groundwater Pesticides: Interactive Effects of Low Concentrations of Carbamates Aldicarb and Methomyl and the Triazine Metribuzin on Thyroxine and Somatotropin Levels in White Rats. *J.Toxicol.Environ.Health* 40: 15-34.

Radwan, M. A., El-Wakil, H. B., and Osman, K. A. (1992). Toxicity and Biochemical Impact of Certain Oxime Carbamate Pesticides Against Terrestrial Snail, *Theba pisana* (Muller). *J.Environ.Sci.Health Part B* 27: 759-773.

Rajagopalan, N., Bhaskar, C., Bankar, V. S., Pokharkar, V. B., Shukla, P. G., Regupathy, A., and Khilar, K. C. (1995). Starch Urea Formaldehyde Matrix Encapsulation of Solid Agrochemicals: III. Studies and Bioefficacy Trials on Double Encapsulation. *Pestic.Sci.* 45: 123-131.

Reddy, V. R., Wang, Z., and Reddy, K. R. (1997). Growth Responses of Cotton to Aldicarb and Temperature. *Environ.Exp.Bot.* 38: 39-48.

Roberts, B. L. and Dorrough, H. W. (1984). Relative Toxicities of Chemicals to the Earthworm *Eisenia foetida*. *Environ.Toxicol.Chem.* 3: 67-78.

Sauls, J. W. (1994). The Effect of Aldicarb on Growth of Young Citrus Trees. *Subtrop.Plant Sci.* 46: 6-8.

Schlenk, D. (1995). Use of Aquatic Organisms as Models to Determine the In Vivo Contribution of Flavin-Containing Monooxygenases in Xenobiotic Biotransformation. *Mol.Mar.Biol.Biotechnol.* 4: 323-330.

Singh, O. and Agarwal, R. A. (1981). Toxicity of Certain Pesticides to Two Economic Species of Snails in Northern India. *J.Econ.Entomol.* 74: 568-571.

Singh, R. K. and Dwivedi, R. S. (1988). Laboratory Evaluation of Some Pesticides Against Sclerotium rolfsii Sacc. a Foot-Rot Pathogen of Barley (*Hordeum vulgare* L.). *Pesticides* 22: 20-23.

Song, M. Y. (1996). Comparative Toxicity of Four Insecticides, Including Imidacloprid and Tebufenozone, to Four Aquatic Arthropods and the Influence of Salinity on Insecticide Induced Mortality on Two Euryhaline Arthropods. *Ph.D.Thesis, Washington State Univ., Pullman, WA* 127 p.

Song, M. Y. and Brown, J. J. (1998). Osmotic Effects as a Factor Modifying Insecticide Toxicity on *Aedes* and *Artemia*. *Ecotoxicol.Environ.Saf.* 41: 195-202.

Song, M. Y., Stark, J. D., and Brown, J. J. (1997). Comparative Toxicity of Four Insecticides, Including Imidacloprid and Tebufenozone, to Four Aquatic Arthropods. *Environ.Toxicol.Chem.* 16: 2494-2500.

Spaull, A. M., Mewton, P. G., and Clements, R. O. (1985). Establishment and Yield of Three Ryegrasses Following Aldicarb Use, and Change in Abundance of Plant Parasitic Nematodes. *Ann.Appl.Biol.* 106: 313-321.

Sreenivasa, M. N. and Bagyaraj, D. J. (1989). Use of Pesticides for Mass Production of Vesicular-Arbuscular Mycorrhizal Inoculum. *Plant Soil* 119: 127-132.

Stapel, J. O., Cortesero, A. M., and Lewis, W. J. (2000). Disruptive Sublethal Effects of Insecticides on Biological Control: Altered Foraging Ability and Life Span of a Parasitoid After Feeding on Extrafloral Nectar of Cotton Treated with Systemic Insecticides. *Biol.Control* 17: 243-249.

Sturm, A. and Hansen, P. D. (1999). Altered Cholinesterase and Monooxygenase Levels in *Daphnia magna* and *Chironomus riparius* Exposed to Environmental Pollutants. *Ecotoxicol.Environ.Saf.* 42: 9-15.

Sturz, A. V. and Kimpinski, J. (1999). Effects of Fosthiazate and Aldicarb on Populations of Plant-Growth-Promoting Bacteria, Root-Lesion Nematodes and Bacteria-Feeding Nematodes in the Root Zone of Potatoes. *Plant Pathol.* 48: 26-32.

Sundaram, R. and Velayutham, B. (1988). Relative Efficacy of Some Insecticides and Neem Cake in the Control of *Rotylenchulus reniformis* and *Helicotylenchus dihystera* Affecting Garden Bean. *Indian J.Nematol.* 18: 329-331.

Sundararaju, P. and Koshy, P. K. (1986). Control of *Radopholus similis* on Areca nut Seedlings with Aldicarb, Aldicarb Sulfone, Carbofuran and Fensulfothion. *Indian J.Nematol.* 16: 4-7.

Suorsa, K. E. and Fisher, S. W. (1986). Effects of pH on the Environmental Fate of [14C]Aldicarb in an Aquatic Microcosm. *Ecotoxicol.Environ.Saf.* 11: 81-90.

Thomas, P. T. and Ratajczak, H. V. (1988). Assessment of Carbamate Pesticide Immunotoxicity. *Toxicol.Ind.Health* 4: 381-390.

Thomas, P. T., Ratajczak, H. V., Eisenberg, W. C., Furedi-Machacek, M., Ketels, K. V., and Barbera, P. W. (1987). Evaluation of Host Resistance and Immunity in Mice Exposed to the Carbamate Pesticide Aldicarb. *Fundam.Appl.Toxicol.* 9: 82-89.

Trudgill, D. L. (1987). Effects of Rates of a Nematicide and of Fertiliser on the Growth and Yield of Cultivars of Potato Which Differ in Their Tolerance of Damage by Potato Cyst Nematodes (*Globodera rostochiensis* and *G. pallida*). *Plant Soil* 104: 235-244.

Trudgill, D. L. (1986). Effects of Soil Treatment for the Control of *Pratylenchus penetrans* (Nematoda) on the Growth and Yield of Raspberry (*Rubus idaeus*) in Scotland. *Crop Res.* 26: 89-110.

U.S.Environmental Protection Agency (1981). Acephate, Aldicarb, Carbophenothion, DEF, EPN, Ethoprop, Methyl Parathion, and Phorate: Their Acute and Chronic Toxicity, Bioconcentration Potential, and Persistence as Related to Marine Environments. EPA 600/4-81-041, U.S.EPA, Gulf Breeze, FL 255 p. (U.S.NTIS PB81-244477).

Verma, K. K. and Gupta, D. C. (1986). Studies on Effect of Nitrogen Phosphorus and Potassium Fertilizers Singly and in Combination with Pesticides on Cowpea (*Vigna unguiculata* (L.) Walp) Infected with *Meloidogyne javanica*. *Indian J.Nematol.* 16: 51-55.

Wei, L. Y., Chao, J. S., and Hong, C. C. (1997). Assessment of the Ability of Propoxur, Methomyl, and Aldicarb, Three Carbamate Insecticides, to Induce Micronuclei In Vitro in Cultured Chinese Hamster Ovary Cells and In Vivo in BALB/c Mice. *Environ.Mol.Mutagen.* 29: 386-393.

Yarsan, E., Tanyuksel, M., Celik, S., and Aydin, A. (1999). Effects of Aldicarb and Malathion on Lipid Peroxidation. *Bull.Environ.Contam.Toxicol.* 63: 575-581.

Yassin, M. Y. and Ismail, A. (1994). Effect of Some Oilseed Cakes as Soil Amendments and Aldicarb on Cowpea Plants Infected with *Rotylenchulus reniformis* Lin. and Ol. in Relation to Soil Type. *Anz.Schaedlingskd.Pflanzenschutz* 67: 176-178.

Zaman, M. and Karimullah (1987). Evaluation of Granular Systemic Pesticides Against the Major Sucking Pests of Jute in Peshawar. *Pak.J.Agric.Res.* 8: 61-66.