行政院及所屬各機關出國報告

（出國類別：研習；編號：**PIO/P No.: 484-C02-20331**）

農藥殘留監測體系及蔬菜安全用藥模式交互運用之研究

Cooperative Study of Pesticide Residue Control System and Safe Use of Pesticides

服務機關：行政院農業委員會農業藥物毒物試驗所

出 國 人： 職稱 ：副研究員

姓名 ：段淑人

出國地區：美國

出國期間：91 年 9 月 1 日至 92 年 2 月 28 日

報告日期：92 年 3 月 24 日

系統識別號:C09201228

公 務 出 國 報 告 提 要

頁數: 20　含附件: 是

報告名稱:

參加經濟部國際合作處九十一年度聯合技術協助訓練計畫赴美研習農藥殘留監測體系及蔬菜安全用藥模式交互運用之研究

主辦機關:

行政院農業委員會農業藥物毒物試驗所

聯絡人／電話:

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出國人員:

段淑人　行政院農業委員會農業藥物毒物試驗所　殘毒管制組　副研究員

出國類別: 研究

出國地區: 美國

出國期間: 民國 91 年 09 月 01 日 -民國 92 年 02 月 28 日

報告日期: 民國 92 年 03 月 25 日

分類號/目: F0／綜合（農業類）　F0／綜合（農業類）

關鍵詞: 農藥殘留, 溫室粉蝨, 昆蟲生長調節劑, 病原菌偵測, Pierce's Disease, Glassy winged sharpshooter, PCR, ELISA

內容摘要: 農藥殘留監測體系及蔬菜安全用藥模式交互運用之研究本訓練計畫期限爲半年，前五個半月至美國加州河濱大學(University of California, Riverside, UCR)昆蟲學系，研修三門昆蟲系課程，並進入兩間實驗室研究蔬菜及果樹重要害蟲之防治方法。其一爲以專一性高之兩種昆蟲生長調節劑(IGR)--Buprofezin及pyriproxyfen爲主，研究其對溫室粉蝨(Green house whitefly) 之防治藥效。並研究如何檢測系統性藥劑(imidacloprid)在草莓作物中之殘留量，以了解其與害蟲防治藥效間之相關性，確實把握正確的施藥時機及濃度，以期有效控制害蟲並於採收時符合安全標準。其二爲針對Pierce’ s Disease研發精確快速之鑑定法，以酵素聯結免疫吸附檢定法(ELISA)及聚合瑎連鎖反應(PCR)檢測作物及蟲媒(Glassy Winged Sharpshooter, GWSS)體內植物病原菌(Xylella fastidiosa)之含量，以建立早期檢定病原菌之方法，避免病害擴散。在UCR研習期間並隨同昆蟲系教授前往佛羅里達州Fort Lauderdale參加第50屆昆蟲學年會(ESA symposium)，及加州San Diego參加Pierce’ s Disease防治研討會，Palm Desert參加農業人員證照研習會議，吸取病蟲害防治及農藥使用新知。最後半個月至Washington DC美國聯邦政府之農業部(USDA)、藥物食品管理局(FDA)及環境保護署(USEPA)，與農藥登記、管理及農民輔導用藥等研究人員交換心得，研習相關技術及策略。本計畫之效益在於引進美國在農藥殘留監測與管制工作之經驗，並參考美國對農民安全用藥教育之模式，針對本國農民之用藥習慣，擬定適宜之管制理念與教育計畫，全力推行以提昇農民之安全用藥理念，使本國農產品之安全品質邁進國際標準。另外，並參訪美國農部植物保護生物科技研究中心，與其研究人員交換農業科技新知，以提昇研習人員之專業知識，增

進負責業務之素養。

本文電子檔已上傳至出國報告資訊網

目　　錄

農藥殘留監測體系及蔬菜安全用藥模式交互運用之研究

行政院農委會藥毒所段淑人

中華民國 92 年 3 月 24 日

摘　要

本訓練計畫期限為半年，前五個半月至美國加州河濱大學(University of California, Riverside, UCR)昆蟲學系，研修三門昆蟲系課程，並進入兩間實驗室研究蔬菜及果樹重要害蟲之防治方法。其一為以專一性高之兩種昆蟲生長調節劑(IGR)--Buprofezin 及 pyriproxyfen 為主，研究其對溫室粉蝨(Green house whitefly) 之防治藥效。並研究如何檢測系統性藥劑(imidacloprid)在草莓作物中之殘留量，以了解其與害蟲防治藥效間之相關性，確實把握正確的施藥時機及濃度，以期有效控制害蟲並於採收時符合安全標準。其二為針對 Pierce's Disease 研發精確快速之鑑定法，以酵素聯結免疫吸附檢定法(ELISA)及聚合瑪連鎖反應(PCR)檢測作物及蟲媒(Glassy Winged Sharpshooter, GWSS)體內植物病原菌(*Xylella fastidiosa*)之含量，以建立早期檢定病原菌之方法，避免病害擴散。在 UCR 研習期間並隨同昆蟲系教授前往佛羅里達州 Fort Lauderdale 參加第 50 屆昆蟲學年會(ESA symposium)，及加州 San Diego 參加 Pierce's Disease 防治研討會，Palm Desert 參加農業人員證照研習會議，吸取病蟲害防治及農藥使用新知。最後半個月至 Washington DC 美國聯邦政府之農業部(USDA)、藥物食品管理局(FDA)及環境保護署(USEPA)，與農藥登記、管理及農民輔導用藥等研究人員交換心得，研習相關技術及策略。本計畫之效益在於引進美國在農藥殘留監測與管制工作之經驗，並參考美國對農民安全用藥教育之模式，針對本國農民之用藥習慣，擬定適宜之管制理念與教育計畫，全力推行以提昇農民之安全用藥理念，使本國農產品之安全品質邁進國際標準。另外，並參訪美國農部植物保護生物科技研究中心，與其研究人員交換農業科技新知，以提昇研習人員之專業知識，增進負責業務之素養。

壹、目的

本次出國研習係奉行政院農業委員會選派參加中美基金九十一年度聯合技術協助訓練計畫，前往美國研習「農藥殘留監測體系及蔬菜安全用藥模式交互運用之研究」計畫六個月。美國在農產品安全用藥暨農藥殘留管制上已建立良好而嚴謹的監測及輔導系統，如加州在針對農藥使用管理上，就農藥使用者及使用地點之管理訂定有全美國最嚴格之管理制度，值得我國參考學習。而美加州大學河濱分校昆蟲系為全美首屈一指的昆蟲學術及應用學研究機構。為能提升研習人員工作之實務經驗，並參考擷取其優點，以應用於我國在農藥使用及殘留管制工作之推動，同時加速朝向國際化之目標，乃擬訂本計畫。本計畫研修人員，行政院農業委員會農業藥物毒物試驗所殘毒管制組副研究員段淑人，自 91 年 8 月 28 日至 92 年 2 月 28 日，為期六個月，赴美國加州河濱大學昆蟲學系，及華盛頓特區等地研習害蟲管理相關知識及技能，並參訪美國聯邦政府業務相關單位在農藥安全使用管理制度之理念及實務操作業務，以截長補短、精益求精。

貳、過程

本次研習承蒙殘管組翁愫慎組長連繫 UC Riverside 昆蟲系推廣教授 Dr. Bob Krieger 協助申請入校研習手續。而 Washington DC 參訪部份則承蒙我國派駐美國之台北經濟文化辦事處經濟組張瀛福博士，協助商洽美國聯邦政府相關部門農業部(USDA)、食品藥物檢驗局(FDA)及環境保護局(EPA)及美國農部植物保護生物科技研究中心，安排研習、訪問人員、地點等。此行除了在 UC Riverside 大學研修昆蟲相關課程、參加昆蟲學術會議及農業應用研究計畫研討會外，並參訪與業務相關之政府單位。研習活動充實、緊湊、且實用，使研習人員受益良多，充分達成研習計畫目標。

全部行程詳如下表：

赴美研習行程表

日 期	研習參訪機關	機 關 地 址	預 定 研 習 內 容
2002 年 8 月 28 日	去程	台灣中正機場→美國加州洛杉磯	去程
2002 年 8 月 29 日	美國加州河濱分校昆蟲系	10 Chapman Hall, Department of Entomology, University of California, Riverside, CA92507	拜會河濱分校昆蟲系 Dr. Bob Krieger 教授
2002 年 9 月 1 日~12 月 31 日	美國加州河濱分校昆蟲學系	Department of Entomology, University of California, Riverside, CA92507	進入加州河濱大學昆蟲學系 Dr. Nick Toscano 教授實驗室研究昆蟲生長調節劑對溫室粉蝨防治效果測定，及藥劑防治對作物生理影響之研究，及系統性化學藥劑在作物中殘留量之測試研究。
2002年9月 23日~12月 15日	美國加州河濱分校昆蟲學系	Department of Entomology, University of California, Riverside, CA92507	加州河濱大學昆蟲學系秋季學期(Fall Quarter) 研修三門昆蟲相關專業學科: 1. Seminar in Entomology; 2. Biological Control—Lecture; 3. Seminar in Biological Control。及一門英文課程 English as a second language
2002年11月 16日	去程	LAX 機場至 FTL 機場	去程; 加州(LAX)→佛羅里達州(FTL)
2002年11月 17日~20日	參加全美第五十屆昆蟲學年會	佛羅里達州 Fort Lauderdale 市立會議中心; Greater Fort Lauderdale	參加第五十屆美國昆蟲學年會，研習昆蟲生態、生理、行

日 期	研習參訪機關	機 關 地 址	預 定 研 習 內 容
		/Broward County Convention Center, Fort Lauderdale, Florida	為、分類及害蟲防治等相關研究新知。
2002 年 12 月 4 日	加州 Palm Desert City	Conference Center, Palm Desert City, CA	參加加州農業局(CDFA)農業專技人員訓練研習會(全天)
2002 年 12 月 15 日~18 日		Conference Center, San Diego, CA	至 San Diego 參加 Pierce's Disease 防治研究計畫年度檢討研討會。
2002 年 12 月 19 日至 31 日	美國加州河濱分校昆蟲學系	Department of Entomology, University of California, Riverside, CA92507	進行研究計畫實驗及整理分析研究資料、撰寫報告
2003 年 1 月 1 日~2 月 25 日	美國加州河濱分校昆蟲學系	Department of Entomology, University of California, Riverside, CA92507	進入加州河濱大學昆蟲學系 Dr. Tom Miller 教授實驗室研究 Pierce's Disease 病原菌 Xylella fastidosa 在寄主植物及媒介昆蟲體內之偵測研究。
2003 年 2 月 6 日(四) 10:00~18:00	第一段參訪去程; Mulan Laboratory	Ontario airport→ San Jose airport; 2226-A Warfield Way, San Jose, CA 95122, USA	參訪化學儀器分析實驗室並與檢驗人員 Anthony T. Le 交換分析技術心得。
2003 年 2 月 7 日(五) 9:00~17:00	Department of Health Services, Food and Drug Laboratory Branch	5705 Hollis Street, Emeryville, CA 94608	拜會加州食品藥物管理局及與農藥使用管理相關主辦人員 Placido P. Dinsay 交換意見。

日 期	研習參訪機關	機 關 地 址	預 定 研 習 內 容
2003 年 2 月 8 日(六) 9:00~16:30	Trangenomic, Inc. 生物科技公司	2032 Concourse Drive, San Jose, CA 95131, USA	參訪生物科技公司了解基因工程食品偵測技術及生化分析技術研究之新產品。
2003 年 2 月 9 日(日)	第二段參訪去程	加州 San Jose → Phoenix →Washington DC airport (DCA)	轉機, 參訪華府去程
2003 年 2 月 10 日(一) 9:00~16:00	駐美國台北經濟文化代表處經濟組	4301 Connecticut Ave., N. W. Suite 420, Washington, DC 20008	拜會駐美國台北經濟文化代表處經濟組吳新華組長、劉富善副組長及張瀛福博士。了解其工作情形並詳談參訪行程。
2003 年 2 月 11 日(二) 9:00~17:00	食品藥物管理局 FDA/ the Center for Food Safety and Applied Nutrition	200 C Street, SW (HFS-308), Washington, DC 20204	拜會美國聯邦食品藥物管理局(FDA/CFSAN)與 Dr. Young H. Lee 交換食品安全農藥殘留檢驗業務經驗及監測系統。
2003 年 2 月 12 日(三) 9:00~16:00	美國農業部 United States Department of Agriculture	Mail Stop 1027, 1400 Independence Ave., S.W. Washington DC. 20050	拜會美國農部(USDA)蔬果農藥殘留管制人員David A. Egelhofer 及Anne E. Dawson交換農藥殘留管制工作心得。
2003 年 2 月 13 日(四) 9:00~17:00	美國農業部農業研究院 (USDA, ARS Beltsville)	Beltsville Agricultural Research Center, BARC-West 10300 Baltimore Avenue Beltsville, Maryland 20705	拜會美國農部植物保護生物科技研究中心，瞭解美國園藝作物保護科技研究新發展，並與 Dr. Ing-Ming Lee 交換農業病蟲害綜合防治研究研究新知。
2003 年 2 月	美國環境保護署	Office of Pesticide Programs (7506C), U.S. Environmental	拜會美國環境保護署 (EPA)與 Linda G. Arrington 及 Dr.

日 期	研習參訪機關	機 關 地 址	預 定 研 習 內 容
14 日(五) 9:00~14:00	USEPA	Protection Agency, 1200 Pennsylvania Ave., NW Washington, DC 20460	Donald E. Eckerman 交換農藥登記管理、容許量訂定及農藥操作者安全推廣教育工作心得。
2003 年 2 月 15 日(六)	自行整理資料	Washington, DC	整理參訪研習資料
2003 年 2 月 16 日~18 日	返回加州河濱大學昆蟲系	Washington DC airport (DCA)→ Ontario airport → UC Riverside	結束參訪行程，返回加州河濱大學昆蟲系。但原訂 16 日早上 10:20 班機，但因 15 日傍晚即有雪暴，積雪太深機場封閉直至 18 日才清除積雪開放飛行
2003 年 2 月 26 日	搭機返國	美國加州洛杉磯→ 台灣台北	搭機返國
2003 年 2 月 28 日	返國	抵達桃園中正國際機場	搭機返國

參、心得

謹將本次赴美研習參訪心得，概分為在加州河濱大學昆蟲系研修課程、害蟲藥效試驗研究、作物病原菌偵測技術研究、參加植物保護相關會議及參訪科技公司與農政單位之感想加以闡述。

一、 專業課程研修

由本次研習課程學習到昆蟲生態學、行為學、生理學、農業害蟲防治學、植物病害及有害雜草之生物防治法，以及昆蟲分子生物學等之相關知識。以下就上課課程內容加以詳述。

課程名稱	課程教學內容
1. Biological Control (ENTM 129; LEC)	Titles of Lecture: 1. Pest wars. 2. History definitions. 3. California angle. 4. Predators. 5. Parasitoids: Life history characters. 6. Pathogens. 7. Classical Biological Control. 8. Mass rearing and problems. 9. How to test for success of BC. 10. Excursion to quarantine and BC grove. 11. Inoculative BC. 12. Biological control of weeds. 13. Transgenics and BC. 14. Issues in BC: Intraguild predation, landscape. 15. Dangers of BC: Case studies.
2. Biological Control (ENTM 254; SEM)	Titles of Seminar: 1. Biological control of invasive pests. 2. Restoring balance: using exotics to control invasive exotics. 3. Euglandian releases for snail control in French Polynesia. 4. Immunocontraception for the control of pestiferous mammals in Australia and New Zealand. 5. Biological control of pestiferous lepidopterans and non-target impacts on native Lepidoptera.
3. Seminar in Entomology (ENTM 250)	Titles of Seminar: 1. The peritrophic membrane and its role in innate insect immunity. 2. Endocrine and immunological host-parasite relationships in the tobacco hornworm. 3. Chemical ecology of cockroaches: synthesis of sex pheromones and their transport through the hemolymph. 4. Vedalia beetle at risk from reduced-risk insecticides. 5. Ecdysteroid regulation of mosquito vitellogenesis: the mechanism controlling cyclicity. 6. Factors governing the spread of an invasion at multiple spatial scales: Argentine ants in north america. 7. Molecular ecology of medflies, mites and other metazoa.
4. English as Second Language	Vocabulary, Idoms, Pronouciation, Grammer, Reading, Writing, Conversation, Listening…

1. 在昆蟲系研修的三門專業課程中，經由 Dr. Mark Hoddle 及 Dr. Richard Stamthamer 教授精心設計的課程及講議，得到昆蟲學的基礎及各方面相關研究的最新資訊。尤其是生物防治學理及技術，讓研習人員受益良多。南加州的生物防治成功案例及研究風氣為世界聞名，而 UC Riverside 昆蟲系的教授亦是生物防治研究的權威。生物防治可避免因施用農藥而造成對自然生態及農業環境的負面影響，以及害蟲抗藥性與農作物農藥殘留的問題。唯要能得到成功的防治效果亦必須有先天條件的配合，必須要注意害蟲與天敵或引進天敵及作物之間的生態一致性，發生時期的配合性及棲群密度的動態，耕作制度及周遭環境、天候條件等各方面的配合，以及天敵本身的殖力與寄生力或捕食能力的強弱均是決定生物防治的重要因子。而引進外來天敵的第一步是必須先鑑定天敵的種類，確定其寄生或捕食能力，並確定其對其他生物無不預期的負面影響；第二步則為建立天敵的人工繁殖系統、使能以經濟有效的方式大量繁殖天敵並能有好的品管流程；第三步則考慮釋放天敵的時間、地點及方式，使天敵能在田間存活，並容易找到寄主害蟲的棲息地發揮天敵的效果；第四步則為如何讓天敵在田間永續繁殖，而不需要一再引進或釋放，使害蟲棲群一直在天敵的控制之下，使害蟲不再造成農業損失，使農民能生產安全高品質的大量蔬果。
2. 台灣近年來由於農業耕作相的改變，園藝作物已漸漸變成主要栽培項目，且因農產品進口而引入一些新興害蟲並隨之猖獗，因此防檢疫工作顯得特別重要，尤其部份害蟲對殺蟲藥劑容易產生抗藥性，使得化學防治工作變得非常棘手，因此國外對該類害蟲的管理，往往是利用天敵進行防治，而歐美先進國家對此類園藝作物害蟲的生物防治均有高超之技術，目前已有多種生物天敵均已商品化，行銷世界各地作為防治害蟲的利器。雖然我國對捕食性及寄生性天敵如草蛉、寄生蜂、捕植蟎等，亦均有量產之技術，但因我國與歐美國家的氣候條件及耕作方式相差懸殊，故絕大多數的害蟲均無法單以生物防治法進行控制，必須配合其他安全、低毒性的藥劑或物理方法或微生物防治法進行害蟲的綜合管理，方能達到有效又安全的防治效果。

二、昆蟲生長調節劑對溫室粉蝨藥效之後研究

南加州地區之溫室粉蝨(*Trialeurodes vaporariorum* Westwood)對兩種昆蟲生長調節劑(Insect Growth Regulators, IGRs)之感受性於本文中在自然光及溫濕度恆定條件之溫室內進行評估。Pyriproxyfen 可干擾溫室粉蝨卵期的胚胎發育而嚴重影響卵的孵化率，經噴灑不同濃度的 Pyriproxyfen 14 天後對照組已有 98%以上的孵化率，高濃度 3.2 及 0.8 AI mg/ml 之處理組的卵粒完全受到抑制，三個不同地區的粉蝨均無孵化的若蟲產生。而低濃度 0.02 AI mg/ml 之處理組的卵則有 30.2~49.6%不等的孵化率，並產生地區性的顯著性差異，Irvine 地區成蟲所產的卵粒其孵化率較 Oxnard 地區 Hails Rd.及 Las Posas Rd.兩處的卵粒受到更嚴重的抑制。Pyriproxyfen 亦可阻礙若蟲的正常發育，即使 0.2 AI mg/ml 之處理組有少數的卵粒孵化為若蟲，但也全數死於一齡若蟲期。而低濃度 0.02 AI mg/ml 處理組的卵雖然有 30%以上的孵化率，可是在一、二齡的若蟲發育期間有 82.3~94.7%的死亡率產生。Buprofezin 可抑制幾丁質之合成，對所有齡期之若蟲均有干擾生長發育而產生致死的效果，施藥七天後，高濃度 1050 ug AI/ml 可造成 74~81%死亡率，低濃度 16.4 ug AI/ml 亦可造成 28~35%的死亡率；十四天後高濃度可造成 98%以上的若蟲死亡率，而次高濃度 262.5 ug AI/ml 亦可造成 88%以上的死亡率。而存活的若蟲的生長發育均明顯地受到 Buprofezin 的影響，僅少數發育至二齡，多數均停滯在一齡若蟲期，無法順利生長發育。Buprofezin 對 Irvine, Hails Rd 及 Pas Losas Rd.三處粉蝨若蟲的半致死濃度依序為 132.09±11.39, 81.68±8.29 及 84.16±13.30 ug AI/ml，由半致死濃度結果可知，Oxnard Hails Rd 及 Pas Losas Rd.的若蟲對 Buprofezin 有極相似之感受性，可能因為此二處的地理位置較為鄰近，而 Irvine 與 Oxnard 的若蟲感受性則有顯著性的差異。Buprofezin 及 Pyriproxyfen 兩種昆蟲生長調節劑對溫室粉蝨的卵期及若蟲期均有良好的殺傷力及生長抑制力，且對人畜毒性低，在粉蝨的綜合防治上應可利用為輪替使用的安全性藥劑。

三、**Pierce's Disease** 之病原菌 *Xylella fastidiosa* 偵測方法之研究

1. 分子生物學方法：利用不同原理的試劑組自感病作物及傳病媒介昆 Glassy winged sharpshooter 蟲體中萃取病原菌 *Xylella fastidiosa* 的核酸，其中分別利用化學分層法、酵素免疫吸附法及鹽析法自作物或蟲體雜質中提取病原菌細胞內之去氧核糖核酸(DNA)
2. 酵素學方法：利用抗體抗原吸附之原理，採用酵素聯結免疫吸附檢定法(Enzyme linked immuno-sorbent assay, ELISA)，使作物或蟲體中所含之 *Xylella fastidiosa* 的細胞蛋白質與一級抗體(IgG of rabbit anti-*Xylella fastidiosa*)，再利用二級抗體 Goat anti-rabbit 及 enzyme conjugate 與之結合，而後利用 OPD 呈色反應，並於 490nm 波長下檢測吸光值，而計算出病原菌之含量。

無論是分子生物或酵素方法之偵測均可精確而快速地測得樣品中含 *Xylella fastidiosa* 細胞的濃度，如此可以建立田間監測病原菌潛伏及分佈的情形，並於病害發生之早期即提早發現病原菌的踪跡，讓農民儘早做防治的準備。同時所有蟲媒害蟲如 Glassy winged sharpshooter 也因病原菌的存在而降低經濟為害限界(ET)，農民要加強防治害蟲甚至不容許任何一隻害蟲在田間，以防病害的擴散。我國亦栽培大量的葡萄、梨子、柑桔類及其他會感 Pierce's Disease 的作物，因此偵測該病原菌的技術亦顯得特別重要，若即早發現該病原菌的踪跡可以杜絕其蔓延的可能性，而減少農作物的損失。此等偵測技術可在本國農業上發揮精準快速的檢防疫效果，尤其是梨子、葡萄、柑桔類果樹均為我國重要的水果農產品，亦為美國進口本國的大宗果品，一旦在本國田間或進口果品上檢測出該類病原菌，立即且嚴格的防疫措施即需執行，以防止新病原之侵入及病情之擴散。

四、參加全美第 **50** 屆昆蟲學年會

2002 年 Nov. 17~20 in Fort Lauderdale, Florida. 一年一度的美國昆蟲學會年會內容極為豐富包括昆蟲相關研究之科學報告及最新發展，會議計舉行四天，會場共計二十間會議室及研究海報展示室. 報

告方式分為專題演講及研究成果摘要報告，海報逾 500 篇，與會學者及專家計超過 2000 人，會議主題包含：昆蟲分類學，昆蟲行為學，昆蟲形態學，遺傳及演化學，昆蟲生理、生化、毒理、病理及分子生物學，社會性昆蟲，居家及家畜害蟲，農業害蟲之經濟為害與防治研究，寄生性及捕食性天敵之引進，鑑定，繁殖，釋放與效果及風險評估．昆蟲生態學，害蟲密度偵測及分佈監測，蟲相多樣性調查，生物導向殺蟲劑之研發，作用機制，及應用，害蟲抗藥性監測、管理及評估，草皮害蟲之防治，瑞類之分子系統及演化學，病媒昆蟲及衛生害蟲之防治，農業及都市害蟲微生物防治與藥劑防治，抗蟲基因作物轉殖與育種之研究，食草性昆蟲防治外來雜草之研究，森林害蟲防治之研究，媒介昆蟲傳播植物病害之研究與防治，及害蟲綜合防治策略之研究。在全美第五十屆昆蟲學年會中聚集國際間各昆蟲研究學者及專家，將近年來研究成果以精要明確的表達方式報告，會議中感受到大家對研究的熱忱及執著，討論時對問題的見解更可顯現其對研究的專業精神，值得我們學習．以化學藥劑為主，生物防治為輔，並朝向生物導向的新藥劑研發輪用的組合策略，是目前害蟲綜合防治法的主流。唯因應環保及安全理念，近年來歐美各國均亟需研發對人畜低毒、在環境中殘留期短且對施用者使用時無毒害之安全劑型。本國亦應與國際同步，加強農民對農藥安全使用之觀念，嚴禁不肖廠商販售偽劣農藥及高毒性又長殘效性之禁用農藥。而農藥管理單位亦應取消該類藥劑之登記並加強取締不法業者及農民，以確保本國農產品之安全品質與國際形象。

五、參加加州農業部農業人員專職訓練研習會

2002 年 Dec. 4th (7:30am~4:30pm) in Palm Desert, CA; PAPA (Pesticide Applicator Professional Association). 針對農藥使用者管理害蟲之持續教育訓練課程，每節課 45~60 分鐘．內容包括：1. 利用化學藥劑及植物管理湖泊．2. 保護瀕臨絕種生物及野生動植物色免於受到

農藥之危害. 3. 農藥登記及使用之管理辦理及規定之更新. 4. 農藥使用者永續教育之更新. 5. 加州人畜疾病媒介昆蟲與病原菌之更新資料. 6. 農藥施用器械對地下水或表水污染及殘留之影響. 7. 透翅葉蟬(Glassy winged sharpshooter, GWSS) 及 Pierce's 病害在加州 Coachella Valley 之發生與防治. 8. 沙漠地帶草皮研究之更新資料. 9. 利用正確的維護管理方式以避免植物病害. 10. 巨型粉蝨之防治方法. 11. 農藥施用器械的校正技術. 12. 適當的施肥以增進植物健康. 各項更新資料均可經由網路查詢取得。加州農業部針對農業專技人員及噴藥技師舉拜之農業操作研習會，所有人員必須要先經過系列的研究課程取得認證後，方能有施用農藥的資格，且應確認鑑定病蟲草害後，使用正確又具選擇性的藥劑，方能對症下藥達到防治效果，且不會造成其他生物的危害與環境的污染. 而施藥時應依據藥劑標示使用之作物，防治對象，使用方法，推薦濃度，及施藥時機. 同時應注意標示之毒性及注意事項，以及安全採收期等，以確保施藥者安全與食品安全. 而做好施藥器械的選擇及維護校正，更可增加防治管理的效果. 另外作物或草皮種子的栽植密度，周邊環境的管理及施肥技術均會影響作物生長樹勢，避免病蟲害的孳生. 加州近年來主要的害蟲 GWSS 及粉蝨以及其傳播病害應使用政府核准推薦之藥劑，並配合其他生物防治或耕作防治法達到綜合防治之目的。美國之農民教育研習會均屬農民自付費用，而講師教材均屬學理與實務相互蝙合之內容，學員經過相關專業課程訓練後，需通過學科與術科的測驗後方得取得證照，並擁有使用農藥的資格，並每年需接受追踪教育訓練以更新知識及技能。反觀我國的農民則多屬未接受正規農事專業教育，而購買農藥或施用農藥亦無需任何證照或登記備案，易造成違規用藥之情事發生，故應加強農業從業人員及農藥販賣業者的專業知識，以利農藥安全使用輔導計畫之推行。

六、參加 **2002** 年 **Pierce's Disease** 防治研討會

2002 年 Dec. 15~18 in San Diego, CA. 此乃針對 Pierce's Disease

及其媒介昆蟲 Glassy winged sharpshooter 之調查與防治研究計畫研討會. 共有 70 個計畫進行年度執行成果報告, 包含的主題有: 1. 抗病基因及抗病葡萄品種的選育研究. 2. 利用無病原性之 Xylella fastidiosa 菌株或其他細菌防治 Pierce's Disease 之生物防治研究. 3. 具病原性之 *X. fastidiosa* 菌株基因體及致病機制之研究. 4. Pierce's Disease 生態學及流行疫病學之調查研究. 5. 利用寄生性及捕食性天敵防治 GWSS 之研究. 6. GWSS 生物及生態學研究, 進行不同地區及季節或寄主作物之棲群密度調查. 7. GWSS 傳播 PD 的機制途徑研究, 不同檢測方法之研究. 8. GWSS 密度監測方法之比較及藥劑防治效果評估. 9. GWSS 抗藥性監測方法之建立. 10. GWSS 微生物防治方法之研究。Pierce's Disease 計畫年度檢討研習會：近年來加州地區葡萄出現 Pierce's Disease 及大量的 Glassy winged sharpshooter, 且柑桔類及多種果樹及蔬菜均有 GWSS 的為害. 加州政府農業局自 2001 年即撥款組織各大學及研究機構之專家共同研究 GWSS 及其傳播病害 PD 之生物及生態學, 並利用化學防治, 生物防治及基因育種等方法防治此二種病蟲害. 各專家於研討會中發揮腦力激盪的精神, 彼此交換研究心得討論研究瓶頸, 並確定下年度研究方向。

七、參訪美國農政單位及生化科技公司

1. 加州生化科技公司

參訪 Transgenomic Bioconsumables Mulan Laboratory 及 PHARMout Laboratories Inc. 兩家公司之實驗室，其一為負責開發型分析儀器及分析管柱，針對化學物質、胺基酸、醣類、有機酸、農藥及去氧核醣核酸等，並新開發檢測基因工程產品(Genetic Manufactory Organism, GMO)之管柱及分析方法；其二為負責分析大量血液樣品，主要檢測血液中糖濃度及已知毒性物質或化學物質之濃度。此二實驗室之規劃設計與工作團隊均頗具規模。本所殘毒管制組的分析規模可與其媲美，雖然部份儀器機型較為老舊，但在專業的操作與維護技術下仍可發揮相當的分析水準。

2. 加州藥物食品管理局實驗室

加州之農產品種類及產量均居美國之冠，加州政府對食品安全健康管理的政策相當重視，至於該州農民之教育與農產品安全監測制度亦有完善的規劃與嚴謹之執行計畫。美國針對農藥使用之相關工作係採取行政分工，主要之參與單位在聯邦政府有環境保護署、藥物食品管理局及農業部。藥物食品管理局負責蔬果農藥殘留監測及食品安全評估。在州政府則主要由環保局及農業局負責，並在各鄉鎮內設置農業推廣中心，而各大學昆蟲學系或植物病理學系亦有推廣教育中心，由各專業教授進行病蟲草害研究計畫，可由農民組織自籌研究經費，提供推廣教授進行防治藥效試驗所需費用，且州政府亦有編列預算自行成立年度工作計畫。我國目前雖有農委會農業藥物毒物試驗所殘毒管制系負責全國田間、集貨場或部份大賣場之生鮮蔬果中農藥殘留檢驗工作，但因農藥殘留工作為農藥使用的結果，係為農藥管理的末端，對於農藥工廠、農藥販售商及農民的約束與教育工作，尚亟需其他部會相關單位的專業人員及工作團隊的配合，且凡是應以教育為根本，我國應多加強專業人員的培訓及證照監督制度，再配合法律的約束力量，方能達到良好的農藥管制效果。

3. 美國環境保護署

美國聯邦政府環境保護署負責農藥的販售及使用管理，包括農藥申請登記、銷售、風險評估、殘留防止、農藥使用管制及農藥安全措施及防護教育推廣等工作。目前該署設有 800 位專業人員負責該等業務，其中 120 人負責化學農藥的申請審查作業。各項申請案件均透過網路申請，審查流程約需經半年至一年完成(附件一)。由於風險評估的研究結果，環保署不再接受高毒性的化學農藥申請註冊。並編印雙語的推廣手冊及宣傳單張(附件二)，針對社區居民、學校學生、農民、農場工人及農藥工廠工人進行教育，利用圖說及淺顯文字或漫話等有趣插圖的刊物，每年亦出版該年度計畫年報酬附件三)，且利用網路流通最新的相關資訊。相較之下，我國目前在農委會農業資材科負責農藥登記的人力則過於單薄，且農業藥物

毒物試驗所技術服務室雖已成立農藥申請的單一窗口，但業務量繁雜，同樣面臨人力短缺的窘境，我政府應儘速解決主辦單位人力不足的問題，以利農藥管理業務的順利推行。

4. 美國農業部

農業部負責肉類、乳製品農藥殘留監測、農藥安全使用教育、病蟲害綜合防治技術研發及安全用藥技術推廣等工作。作物中農藥殘留量檢驗工作由各州設立之檢驗部門自行抽測該州的生鮮蔬果，並配合各大學設立之農業推廣研究中心進行防治及用藥技術的教育工作。

5. 美國農部植物保護生物科技研究中心

植物保物研究中心分為植物病理研究及作物害蟲研究兩大部份，與李英明博士談及有關植物病原菌之偵測技術研發工作，利用聚合瑎鏈鎖反應(Polymerase Chain Reaction, PCR)及限制酵素切割後去氧核醣核酸片段的長度圖譜(Restriction Enzyme Fragment Profile, RFLP)，做為鑑定菌種之基礎，先確認病原菌之後方能對症下藥，達到掌握時機正確用藥的防治效果。

肆、建議

我國以農立國，農作物種類及產量豐富，加上農民的栽種技術不斷精進，在有限的土地上利用複種及輪種的制度，並配合產期調節的技術，國人終年均可吃到美味的生鮮蔬果，唯由於本省氣候高溫多濕，病蟲害容易孳生，農民為使農作物免於受到病蟲害的為害，施用農藥即成為快速又有效的防治手段。但國民對於環境保護及安全保健的意識提昇，已對農產品中農藥殘留的安全性產生危機意識，同時為了即將加入世界貿易組織(World Trade Organization, WTO)，若再不重視農藥管理及殘留監測問題，將使國內農業遭受較大衝擊。為提升我國農業的產業競爭力，並期自我國加入 WTO 後，國內農產品免遭受進口農產品或因殘留量而遭拒收之衝擊。為此，特研提以下建議：

一、為因應我國加入 WTO 國際組織後，將面對國際貿易自由化之潮流

衝擊、並極力推動我國農產品進軍國際，不但要提供給農民暢通的外銷管道，更應先掌握出口國家各農藥推薦種類與農藥殘留容許量標準之最新完整資訊，以避免可能導致退關之窘境。此部份亟待建立資訊網路，隨時掌握國際情勢，並透過跨部會「農藥殘留容許量協商工作小組」，擬定對外協商程序時間表，以利農業貿易之永續經營。

二、我國對於農藥申請登記的管理工作，人力與經費明顯不足，為提昇我國在農藥登記、販賣及使用者之管理績效，我國亦應仿效美國推動「證照制度」，同時應加強取締不明農藥進口、不法藥廠製藥及無照藥販任意販賣來路不明或偽劣農藥。農政單位應加速修正更新適用的「農藥管理法」，因應目前的管理需求。而農藥殘留檢驗的工作量與美國相比，有過之而無不及，唯檢驗僅是確認教育功效的手段之一和執法之依據參考，我國在該項工作已由本所殘毒管制組及全國各縣市政府全力執行，但在人力經費的短缺及部份儀器老舊亟需更新的兩大問題上，期望政府能優先納入考量解決。

三、為加強我國農藥殘留監測與管制體系之運作功能，應自基本做起加強我國農民對安全用藥知識及技能之訓練，由各區農業改良場植保人員執行防治試驗，並指導農民正確用藥，使農民能養成確實填寫用藥紀錄簿之習慣，除了政府編列充裕預算開立各層次各作物之講習會，並配合農產品優良品牌的認證制度，如本所自民國八十三年起輔導發證之農產品安全用藥使用「吉園圃」標章制度。唯我國與美國加州推行情形相比，我政府應再增加預算額度及人員編制。另為求推行成效的提昇，亦應製訂配套的法律罰則，迫使不守法的農民能重視農藥安全使用及農作物農藥殘留的重要性，遵守安全採收期及推薦用藥的規訂，生產安全的農產品。

四、我國農業推廣應用之防治技術研究計畫，多編列於各區農業改良場或部份大學農業推廣中心，但因該類研究多屬短期研究，無足夠經費針對某特定病蟲害或作物進行團隊及長期追踪研究，往往問題尚未研發出解決的對策即告中斷。美國加州農業局對重要病蟲

害每年均編列龐大經費並邀集相關學長專家組成研究團隊，進行深且廣之研究，並於年度末舉辦研討會互相討論共擬對策，我農業部亦應仿效該模式促使農業研究國際化，使得各項資訊及科技均能與歐美同步。

五、此次研習體認到美國政府在各項行政措施、科技研究成果、各種經濟及農業統計資料等，均已利用最先進的電子化、網路化將龐大的資料整合，以方便社會大眾、甚至國際間有需要者使用，此對提升政府行政效能，及因透明化提高民眾與政府間之互信與互動有莫大的助益。而我國在資訊科學管理上的發展亦不比美國差，唯各級政府應加強推動業務資訊化，加速政府行政效能，使各項政策在推行時能爭取全國民眾支持，可以先從全國各級農會農產資料及農民資料做起，並準備好加入 WTO 因應國際農業變動、掌握最新資訊。目前農委會雖已完成許多連結網站可查詢到部份資料，但與美國相較仍需再增加人力、經費及設備，以加速完備強化整個農業資訊系統。

伍、附件

一、美國農藥管理計畫 2001 年年報（Office of Pesticide Programs FY 2001 Annual Report）

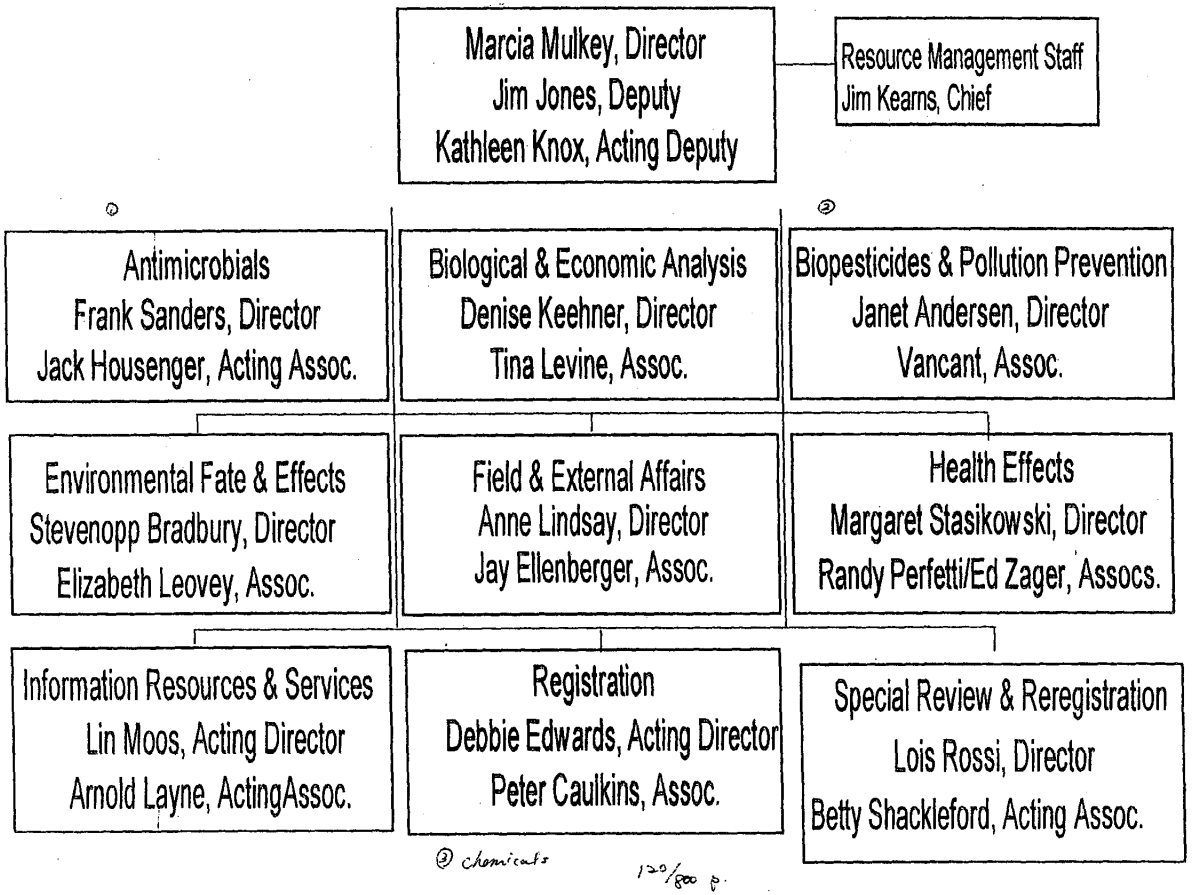
二、美國環保署出版—如何免除農藥的污染（Steps to Protect Yourself from Pesticides）

三、美國農藥的申請流程(Registering a Pesticide with US EPA)

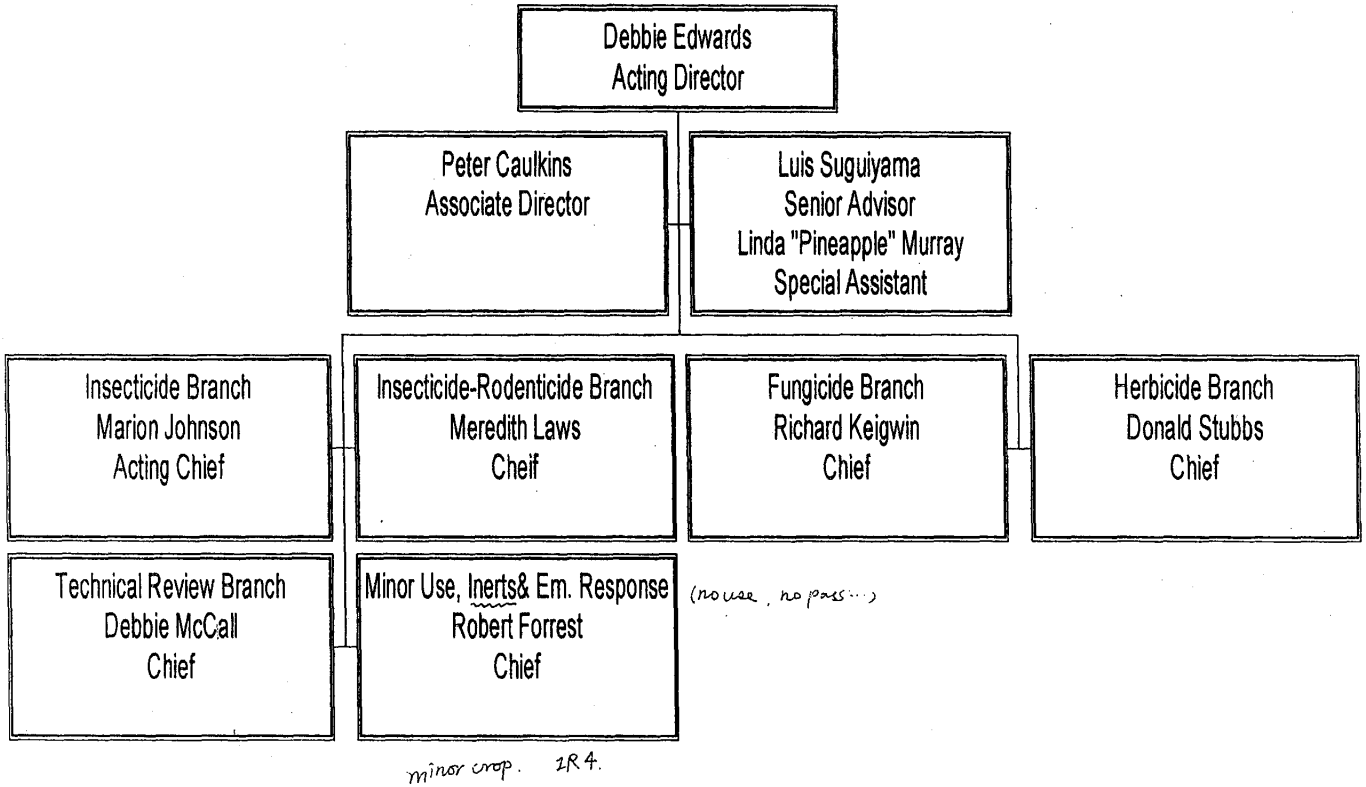
Registering a Pesticide with US EPA

Presented by
Linda Arrington
Ombudsman, Registration Division

Office of Pesticide Program Structure



Registration Division



Registration Categories

- New chemical/new active ingredients
- Tolerances
- Me-too products
- Amendments
- Inerts
- Emergency Exemptions
- Special Local Needs
- Experimental Use Permits

Type of Registration Actions

- Types of New Active Ingredients
  - Conventional Chemicals
  - Biologicals (biopesticides and biochemicals)
  - Antimicrobials (e.g., disinfectants)
- Uses of New Active Ingredients
  - Non-food use (e.g., indoor)
  - Food use
    - Requires an accompanying tolerance petition
    - Requires a lot more toxicology and chemistry data

Typical Amendments

- Label Amendments
  - Adding Claims
  - Adding a new use
  - Clarifying use directions
  - Changing precautionary language
- Formulation Amendments
  - Adding new sources
  - Adding alternate formulations

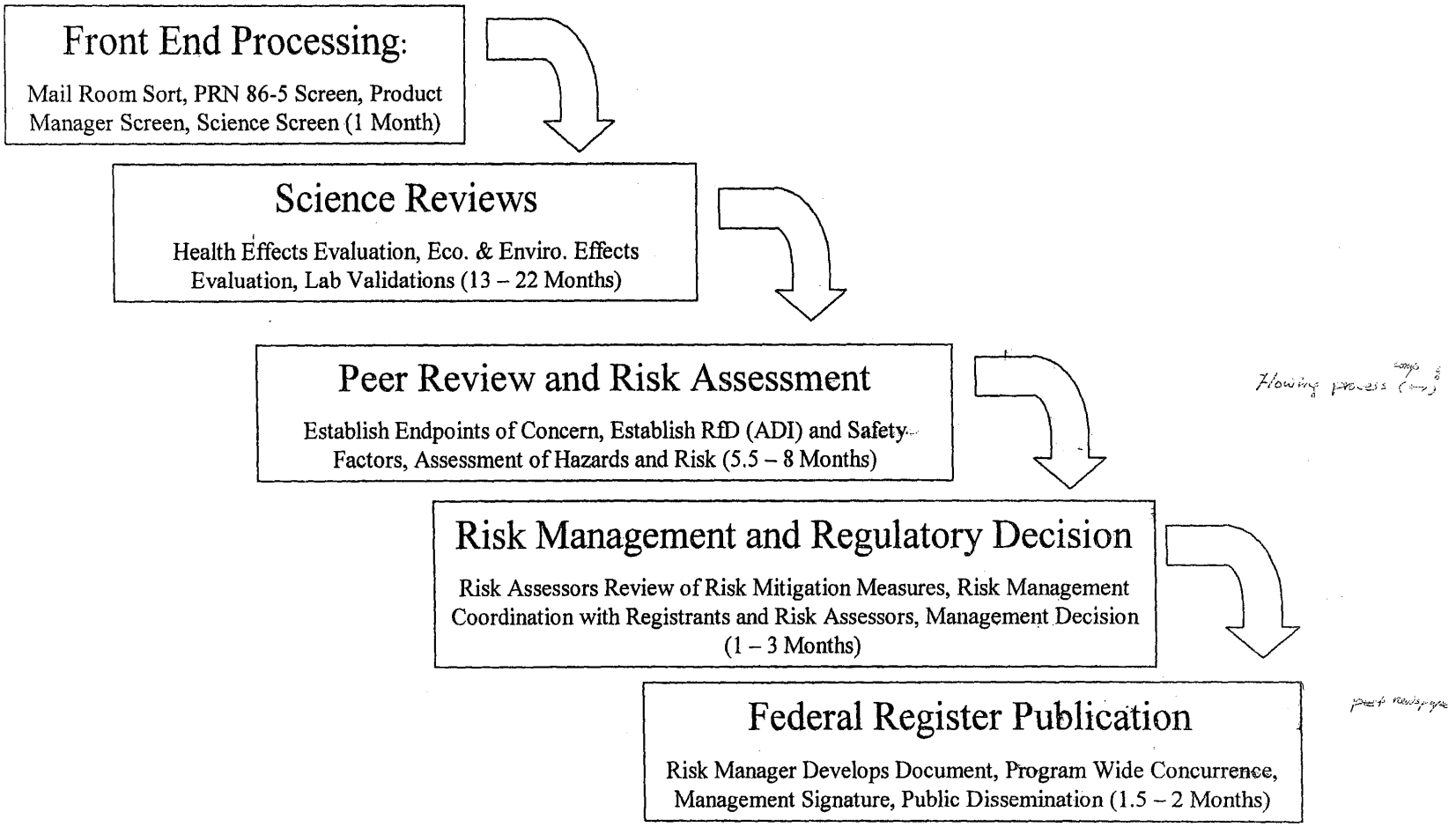
Types of Amendments

- Amendments
  - Require Agency approval before changes are made
- Notifications
  - Changes that must be submitted to the Agency before they are made
- Minor Formulations
  - Certain low-risk formulation changes
- Non-Notifications
  - Changes that can be made without notifying the Agency

Reasons for Amendments

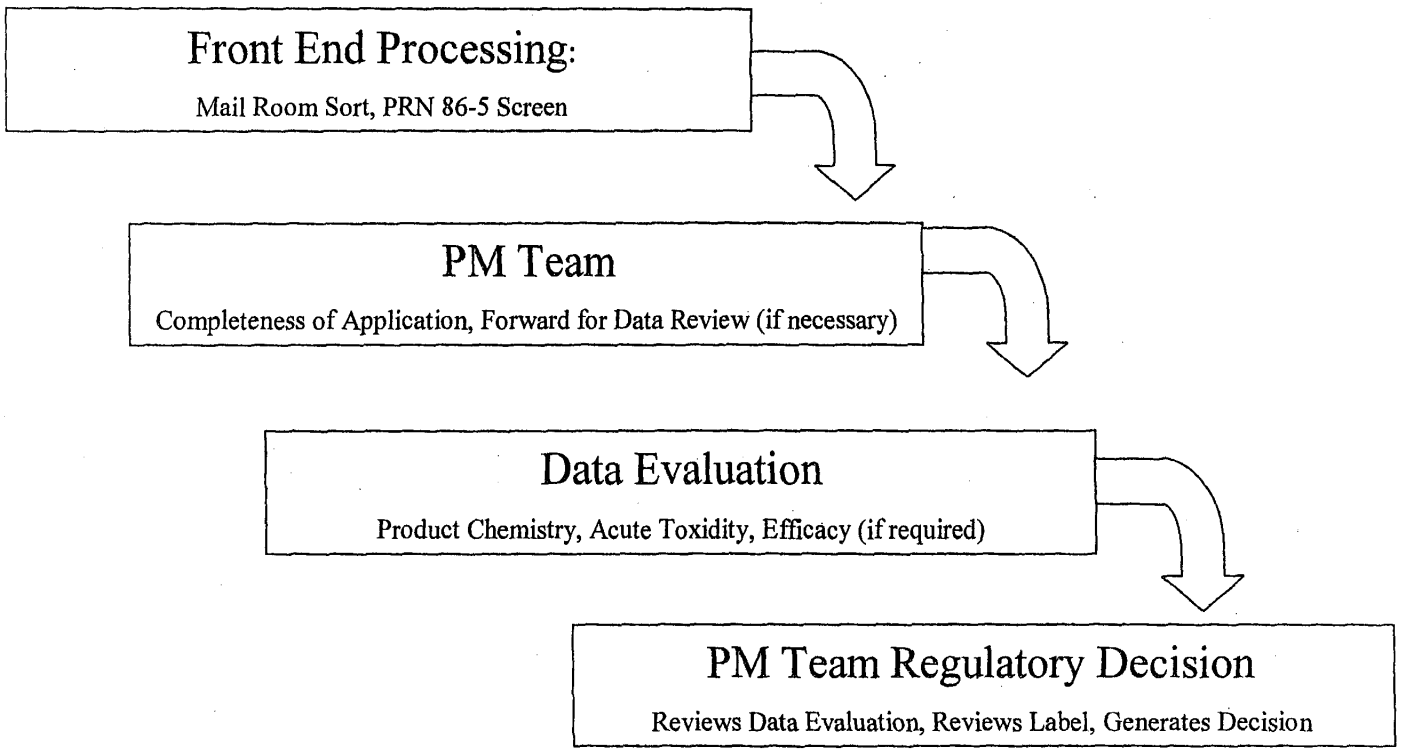
- Marketing
- Agency Direction
  - Pesticide Registration (PR) Notices
  - Reregistration Activities (RED, IRED,TRED) In Special Division
  - Negotiated Agreements for Risk Reduction
  - State Regulatory Requirements

New Chemical Registration



Me-Too Registration

40 days



Websites and Contacts

1. Work Plan Web Site http://www.epa.gov/opprd001/workplan
2. Section 18 Web Site http://www.epa.gov/opprd001/section18
3. Chemical Fact Sheets Web Site
   http://www.epa.gov/opprd001/factsheets
4. Inerts Web Site http://www.epa.gov/opprd001/inerts
5. Registration Kit Web Site
   http://www.epa.gov/opprd001/registrationkit
6. Registration Forms Web Site
   http://www.epa.gov/opprd001/forms
7. Pesticide Applications Web Site
   http://www.epa.gov/opprd001/PestApp
8. RD Contacts List http://www.epa.gov/opprd001/contacts_rd.htm
9. 24(C) Web Site http://www.epa.gov/opprd001/24c

United States Environmental Protection Agency
EPA 735-F-95-005
October 1995

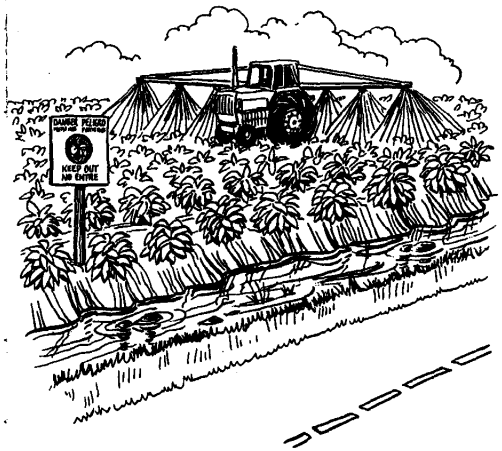
Prevention, Pesticides, and Toxic Substances (7506C)

EPA

Steps to Protect Yourself from Pesticides (Cambodian)

ជំណាក់ការនានាដើម្បីការពារលោកអ្នកពីថ្នាំសម្លាប់សត្វចង្រៃ

At work, pesticides can be on plants and in soil and irrigation water.



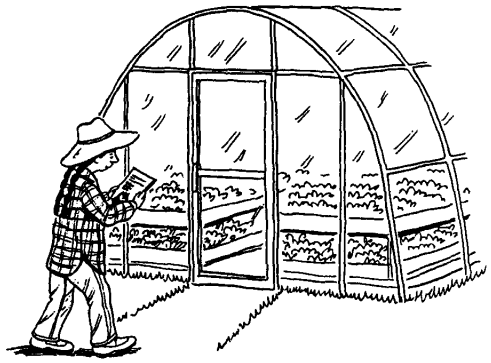
នៅកន្លែងធ្វើការ គេអាចជាក់
ថ្នាំសម្លាប់សត្វចង្រៃនៅ
លើដើមឈើនៅក្នុងដីនិងទឹកបង្ហូរ

Pesticides may drift from nearby applications.

ថ្នាំសម្លាប់សត្វចង្រៃអាចរសាត់
ចេញបានពីកន្លែងដែលជាក់

6 steps to protect yourself
from pesticides.

ជំណាក់ការ៦យ៉ាងដើម្បីការពារ
លោកអ្នកពីថ្នាំសម្លាប់សត្វចង្រៃ

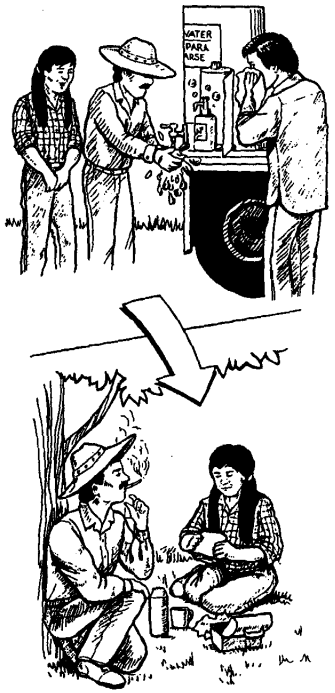


1. Follow directions and obey signs. Stay out of restricted areas.

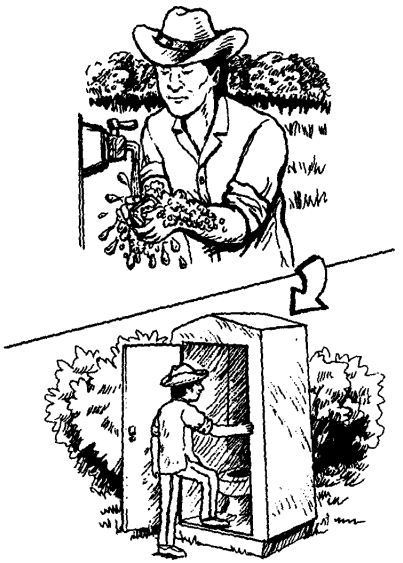
1. ធ្វើតាមការណែនាំនិងគោរពតាម សញ្ញានានា។ នៅខាងក្រៅ កន្លែងដែលគេហាមឃាត់

② Wash your hands and face before you eat, drink, chew gum or tobacco. And...

② លាងដៃនិងមុខ មុនពេល លោកអ្នក ទទួលទានបាយ ទឹក ស្ករកៅស៊ូ ឬទទួលទានថ្នាំរួចហើយនឹង...



Wash your hands **before** you use the toilet.



លាងដៃ មុនពេល លោកអ្នកប្រើបង្គន់

③ Wear work clothes that protect your body from pesticides.

③ ស្លៀកពាក់ខោអាវធ្វើការ ដែលការពារខ្លួនប្រាណលោកអ្នក ពីថ្នាំសម្លាប់សត្វចង្រៃ

④ After work, shower or wash your body with soap and water, and shampoo your hair. Then put on clean clothes.

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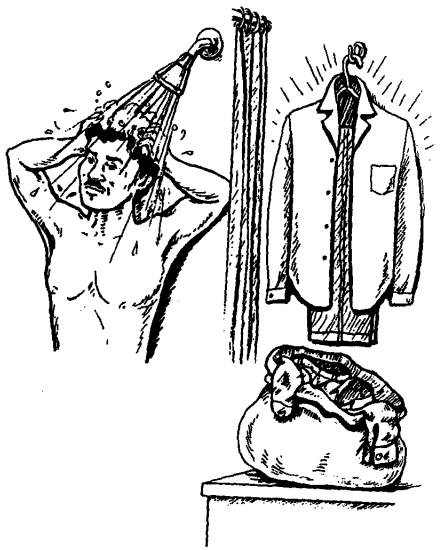
④ ក្រោយពេលធ្វើការ ងូតទឹក
ឬលាងខ្លួនប្រាណជាមួយ
ទឹងសាប៊ូនិងទឹក ដោយកក់សក់
រួចហើយស្លៀកខោអាវដែលបានស្អាត

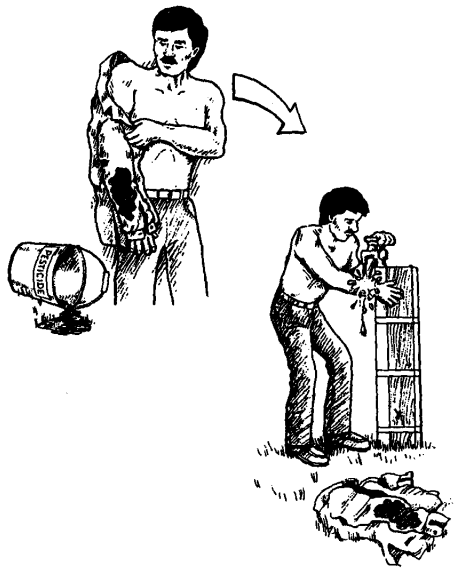


5 Wash your work clothes separately from other clothes before wearing them again.

5 បោកខោអាវថ្វើការផ្សេងគ្នាពី
ខោអាវដទៃទៀតមុនពេល
ស្លៀកពាក់វាម្តងទៀត

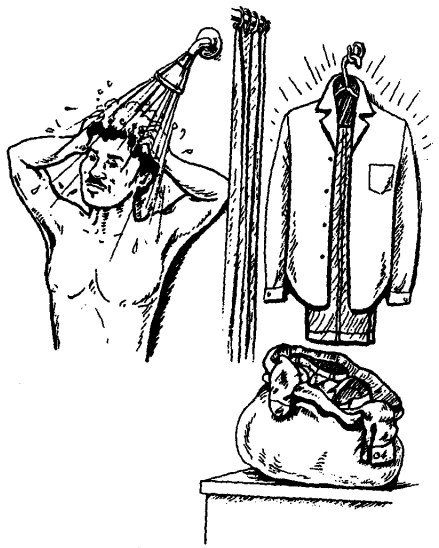
6 If a pesticide is spilled or sprayed on you, wash it off right away with clean water.

6 បើថ្នាំសម្លាប់សត្វចង្រៃកំពប់ឬ
ហូរមកលើខ្លួនលោកអ្នក
សូមលាងជាបន្ទាន់ជាមួយទឹងកល្អ



Shower or wash yourself with soap and water, shampoo your hair, and put on clean clothes as soon as possible.

ងូតទឹកឬលាងខ្លួនប្រាណជាមួយទឹង
សាប៊ូនិងទឹក ដោយកក់សក់រួចហើយ
ស្លៀកខោអាវអោយបានស្អាតជាបន្ទាន់



Within **5 days** more training in pesticide safety will be given to you.

ទៅក្នុងរយៈ៥ថ្ងៃ យើងនឹងជូន
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សម្លាប់សត្វចង្រៃ

For more information, contact the State Lead Agency in your area or the EPA Regional Office nearest you.

ចាពត៌មានបន្ថែមទៀត សូមអញ្ជើញទាក់ទងទៅមួយចំង
State Lead Agency នៅក្នុងតំបន់លោកអ្នក
ឬក៏ការិយាល័យតំបន់របស់ EPA នៅជិតផ្ទះលោកអ្នក

Region 1 (MA, CT, RI, NH, VT, ME)
U.S. Environmental Protection Agency, Region 1
Pesticides and Toxic Substances Branch (APT)
1 Congress St.
Boston, MA 02203 (617) 565-3273

Region 2 (NY, NJ, PR, VI)
U.S. Environmental Protection Agency, Region 2
Pesticides and Toxic Substances Branch
(MS-105)
2890 Woodbridge Ave., Building #10
Edison, NJ 08837-3679 (908) 321-6765

Region 3 (PA, MD, VA, WV, DE)
U.S. Environmental Protection Agency, Region 3
Toxics and Pesticides Branch (3AT-30)
841 Chestnut Building
Philadelphia, PA 19107 (215) 597-8598

Region 4 (GA, NC, SC, AL, MS, KY, FL, TN)
U.S. Environmental Protection Agency, Region 4
Pesticides and Toxic Substances Branch
(4-APT-MD)
345 Courtland St., N.E.
Atlanta, GA 30365 (404) 347-5201

Region 5 (IL, MI, MN, IN, OH, WI)
U.S. Environmental Protection Agency, Region 5
Pesticides and Toxic Substances Branch (5SPT)
77 W. Jackson Blvd.
Chicago, IL 60604 (312) 886-6006

Region 6 (TX, OK, AR, LA, NM)
U.S. Environmental Protection Agency, Region 6
Pesticides and Toxics Branch (6T-P)
1445 Ross Ave.
Dallas, TX 75202-2733 (214) 655-7235

Region 7 (MO, KS, IA, NB)
U.S. Environmental Protection Agency, Region 7
Toxics and Pesticides Branch (TOPE)
726 Minnesota Ave.
Kansas City, KS 66101 (913) 551-7020

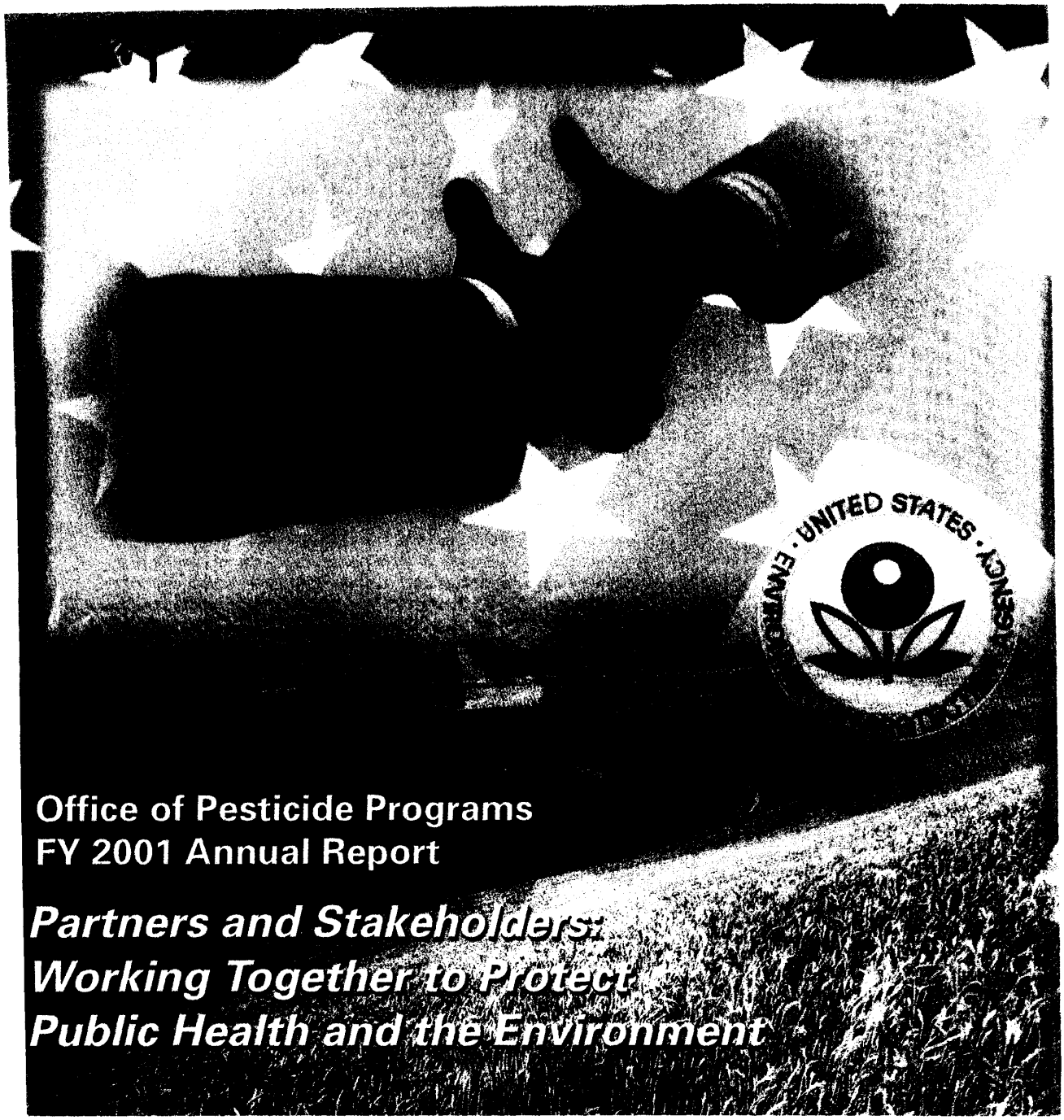
EPA Regional Offices continued on back

EPA Regional Offices/continued

Region 8 (CO, MT, ND, SD, UT, WY)
U.S. Environmental Protection Agency, Region 8
Toxic Substances Branch (8ART-TS)
One Denver Place, Suite 500
999 18th St.
Denver, CO 80202-2405 (303) 293-1730

Region 9 (CA, NV, AZ, HI, GU)
U.S. Environmental Protection Agency, Region 9
Pesticides and Toxics Branch (A-4)
75 Hawthorne St.
San Francisco, CA 94105 (415) 744-1090

Region 10 (WA, OR, ID, AK)
U.S. Environmental Protection Agency, Region 10
Pesticides and Toxic Substances Branch (AT-083)
1200 Sixth Ave.
Seattle, WA 98101 (206) 553-1091



Office of Pesticide Programs
FY 2001 Annual Report

Partners and Stakeholders: Working Together to Protect Public Health and the Environment

Dear Readers:

EPA's Office of Pesticide Programs (OPP) is pleased to provide you with a summary of the many important accomplishments carried out during fiscal year 2001.

OPP is entrusted with responsibility for safeguarding public health and the environment from pesticide risks. We also work hard to ensure that pesticides are regulated fairly so that new technology can enter the market while also meeting the tough requirements of the Food Quality Protection Act. I am pleased to note that the accomplishments described in this report were possible because of the dedication and hard work by OPP's diverse and talented employees as well as many contributions by our regulatory partner and stakeholders.

During FY 2001, we adopted a more concise format for our annual report. While shorter in length than previous reports, it is rich in detail describing our accomplishments and progress. The first seven pages summarize registration, reregistration, and tolerance reassessment activities as well as our advancements in the area of science policy development and technology. The remaining six pages provide a snapshot of many other pesticide regulatory and program implementation activities with our regional, state, and tribal partners and many other stakeholders. To complement this report and provide you with further details about our many other important program activities, we encourage you to visit our Web site at www.epa.gov/pesticide

Finally, September 11 abruptly changed the lives of all Americans. Our national concern for security at home and abroad is in the forefront. While EPA's broad mission has become more complex, our goals remain basic, as described by our Administrator, Christine Todd Whitman, "to make our air cleaner, our water purer, and our land better protected." To that end, I call upon your continued cooperation and support to help us bring about greater protection of public health and to safeguard the natural environment from pesticide risks.

Sincerely,

Marcia E. Mulkey

Marcia E. Mulkey, Director
Office of Pesticide Programs

CONTENTS

EPA's Role in Regulating Pesticides

The mission of EPA's Office of Pesticide Programs (OPP) is to protect human health and the environment from unreasonable adverse effects resulting from the use of pesticides. OPP's mission also assures a reasonable certainty of no harm from pesticides in the diet of all Americans, especially children. OPP regulates the use of pesticides under the authority of two major federal statutes: the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Federal Food, Drug, and Cosmetic Act (FFDCA), both significantly amended by the Food Quality Protection Act of 1996 (FQPA). Under FIFRA, EPA has the authority to register (license) the use(s) of a pesticide and suspend or cancel the use(s) of a pesticide if its use would pose unreasonable risks. Under FFDCA, the Agency is responsible for setting tolerances (maximum permissible residue levels) for any pesticide used on food or animal feed. With the passage of FQPA, the Agency is required to establish a single, health-based standard for pesticides used on food crops and to determine if tolerances are safe for children.

The process by which OPP examines the ingredients of a pesticide to determine if they are safe is called the registration process. The program evaluates the pesticide to ensure that it will not have any adverse effects on humans, the environment, and nontarget species. Applicants seeking pesticide registration are required to submit a wide range of data on health and ecological effects, environmental fate, and product and residue chemistry. A pesticide product cannot be legally used in the United States if it has not been registered by EPA unless it is specifically exempted from regulation under FIFRA. If emergency conditions exist, EPA may allow use of an unregistered pesticide under an emergency exemption or a state may declare a crisis exemption, which allows the unregistered use for 15 days. EPA confers with the state and performs a cursory review of the use at this time.

Through a process called reregistration, OPP is reviewing older pesticides–registered before 1984–to ensure that they meet current, more stringent health and environmental standards. After reviewing a pesticide for reregistration, OPP issues a *Reregistration Eligibility Decision* (RED) document or an *Interim Reregistration Eligibility Decision* (IRED) document detailing whether the pesticide can remain on the market or if changes in label instructions must be made in order to reduce risks to consumers. During reregistration, OPP also reassesses tolerances as required by FQPA to ensure that they meet current safety standards and issues *Reports on FQPA Tolerance Reassessment Progress and Interim Risk Management Decisions* (Tolerance Reassessment Eligibility Documents [TREDs]). To date, OPP has reassessed almost 4,000 of the 9,721tolerances requiring reassessment.

The Office of Pesticide Programs

Antimicrobials Division - 703-308-6411. Responsible for all regulatory activities associated with antimicrobial pesticides.

Biological and Economic Analysis Division 703 - 308-8200. Responsible for assessing pesticide use and benefits and operating analytical chemistry and antimicrobial testing laboratories.

Biopesticides and Pollution Prevention Division - 703-308-8712. Responsible for all regulatory activities associated with microbial pesticides, biochemical pesticides, and plant-pesticides, and for the Pesticide Environmental Stewardship Program.

Environmental Fate and Effects Division - 703-305-7695. Responsible for evaluating and validating data submitted on the environmental fate and effects of pesticides on nontarget organisms, as well as for characterizing risks to such nontarget organisms.

Field and External Affairs Division - 703-305-7102. Responsible for program policies and regulations, legislation and Congressional interaction, regional, state and tribal coordination and assistance, international and field programs, and communication outreach.

Health Effects Division - 703-305-7351. Responsible for evaluating and validating data on the effects of pesticides, as well as for characterizing risks to humans and domestic animals.

Information Resources and Services Division - 703-305-5440. Responsible for Freedom of Information Act (FOIA) and Public Docket Management, databases and computer support, FIFRA section 6(a)(2) incident reporting, pesticide incident monitoring, and National Pesticide Information Center.

Registration Division - 703-305-5447. Responsible for all regulatory activities for all pesticides not assigned to the Biopesticides and Pollution Prevention Division or the Antimicrobials Division.

Special Review and Reregistration Division - 703-308-8000. Responsible for reregistration, tolerance reassessment, and Special Reviews.

20 Active Ingredients Registered

•12 Conventional Pesticide Active Ingredients (includes 1 organophosphate alternative and 4 reduced-risk pesticides):

Chemical/Use
– Picaridin/Insect Repellent
–Thiamethoxam/Barley (seed), Canola (seed), Cotton (seed), Sorghum (seed), Wheat (seed)
–Chlorfenapyr/Ornamentals (greenhouse)
–Ethametsulfuron Methyl/Canola, Crambe, Rapeseed
–Zoxamide/Potatoes, Grapes
–Flumioxazin/Soybeans (seed), Peanuts
–Mesotrione/Field Corn
–Tepraloxydim/Canola, Cotton, Soybeans
–Fluazinam/Peanuts, Potatoes
–Etofenprox/Crack and Crevice
–Bispyribac-Sodium/Rice
–Novaluron/Ornamentals (indoor, nonfood)

•7 Biopesticides:

Chemical/Use
–Coniothyrium minitans/Sclerotinia in soils
–Cry1F in corn/European corn borer
–4- (or 5-) Chloro-2-methylcyclohexane-carboxylic acid. 1,1-dimethyl ester/Medfly pheromone
–(Z) -11-Hexdecenyl Acetate/Diamondback moth
–Silver Nitrate/Prolongs life of cut flowers
–4-allyanisole/Southern pine beetle
–Pseudomonas chlororaphis strain 63-28/Common fungal pests

•1 Antimicrobial:

Chemical/Use
–Oxonia Active/Disinfectant (hard, nonporous inanimate surfaces in lifestock facilities)

New Pesticides Registered and Other Registration-Related Actions

www.epa.gov/pesticides/hcnrreg.htm

Pesticide products contain both "active" and "inert" ingredients. An active ingredient is one that prevents, destroys, repels, or mitigates a pest, or is a plant regulator, defoliant, desiccant, or nitrogen stabilizer. By law, the active ingredient must be identified by name on the label, together with its percentage by weight. An inert ingredient is simply any ingredient in the product that is not intended to affect a target pest (e.g., a solvent). Highlights of pesticide products registered in FY 2001 include:

Methyl Bromide Alternatives

•Two new products (InLine® and Telone EC®) containing the active ingredient 1,3-dichloropropene (Telone®) as a pre-plant soil fumigant allow drip application to tarped soil, primarily for use on strawberries and tomatoes.

•Terramaster®, a terrazole-containing product for use as a soil sterilant for tobacco crops, allows tobacco transplants to be grown in a float-bed system.

Foot and Mouth Disease Antimicrobial

• Oxonia Active to disinfect hard, nonporous inanimate surfaces in livestock facilities and animal quarters, and on equipment against the potential spread of the Foot and Mouth Disease (FMD) virus.

Organophosphate (OP) Alternative

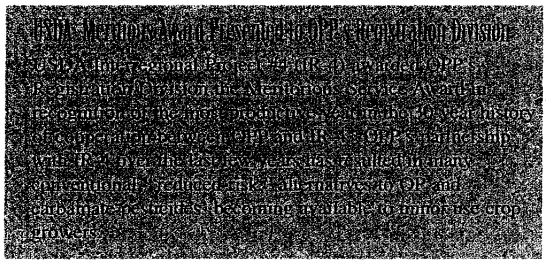
•Thiamethoxam as an insecticide on seeds of barley, canola, cotton, sorghum, and wheat.

New Reduced-Risk Pesticides

•Fluazinam as a fungicide on potatoes and peanuts.
•Mesotrione as an herbicide on field corn.
•Zoxamide as a fungicide on grapes.
•Novaluron as an insecticide on ornamentals (indoor, nonfood).

Insecticide Products Packaging Reexamined to Protect Children

In FY 2001, OPP began reviewing conventional insecticide products labeled for residential use to determine whether the containers meet today's Child Resistant Packaging (CRP) requirements. The Agency identified and required registrants of more than 160 products to make the necessary changes (e.g., changing container size, adding a child resistant cap, or deleting residential uses) to protect children.



OPP's FY 2002 workplan for reviewing applications and making decisions on conventional pesticides can be accessed online at: www.epa.gov/opprd001/workplan

257 New Uses of Registered Active Ingredients

•248 New Uses of Conventional Pesticides (includes 77 reduced-risk pesticide uses, 69 OP alternative uses, 3 methyl bromide alternative uses, 99 IR-4 minor uses)

•9 New Uses of Antimicrobials

80 Other (Inert) Ingredients in Pesticide Products Approved

•72 Nonfood-Use Inert Ingredients

•8 New Food-Use Inerts (with tolerance exemptions established)

542 Emergency Exemptions Granted

(In addition, 33 tolerances were established for emergency exemptions)

1,726 Antimicrobials Registration Decisions

OPP met the FQPA-mandated deadlines for reviewing antimicrobials for public health use:

•180 Old Chemicals (89 fast-track and 91 nonfast-track)

•1,013 Amendments (890 fast-track and 123 nonfast-track)

•533 Notifications

Pesticides Reregistered and Tolerances Reassessed

www.epa.gov/pesticides/reregistration

Pesticide Reregistration

•Completed Reregistration Eligibility Decision (REDs) documents for 3 pesticide active ingredients: benomyl, propargite, and ethion (an OP).

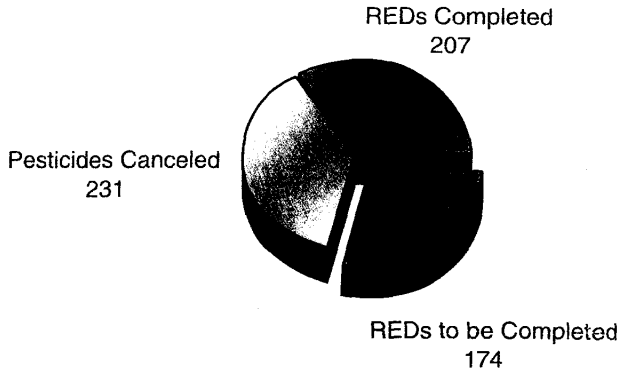
•Issued Interim Reregistration Eligibility Decisions (IREDs) for 6 organophosphate pesticides: acephate, chlorpyrifos, ethoprop, methidathion, pirimiphos-methyl, and terbufos. Organophosphates (OPs) are potentially the most toxic pesticides and are in FQPA Priority Group 1– the first group of pesticides to be reviewed.

•Made reregistration decisions on 856 pesticide products, exceeding goal of 750 decisions: 63 product labels were amended, 613 products were canceled (includes 387 chlorpyrifos products), and other types of reregistration actions were taken for 180 additional products. (One pesticide active ingredient may be used in 10 or more pesticide products, thus requiring reregistraton decisions for all products after a RED has been completed for the active ingredient.)

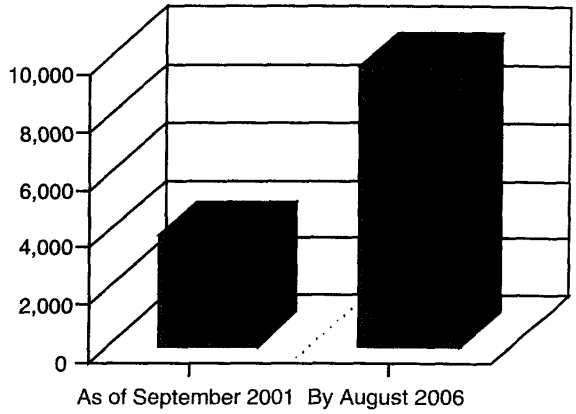
Tolerance Reassessment

•Issued 5 Reports on FQPA Tolerance Reassessment Progress and Interim Risk Management Decisions (TREDs): butylate (thiocarbamate), chlorpyrifos-methyl (OP), oxadixyl, phosalone (OP), and trichlorfon (OP).

Status of Pesticide Reregistration



Tolerance Reassessment



By August 2006, EPA must complete the review of all tolerances that were in effect in August 1996 when FQPA was passed.

•Completed tolerance reassessment decisions for 5 pesticides, bringing the total of tolerances reassessed up to 3,832. This represents 39 percent of the 9,721 tolerances that require reassessment by 2006. Over 63 percent of these decisions were for pesticides in FQPA Priority Group 1.

Review of Organophosphate (OP) Pesticides

•Completed individual decisions for 25 OPs.

•Continued to develop scientific methods and the components of a cumulative risk assessment for the OPs. Cumulative risk assessment combines exposure (the amount of a pesticide to which an individual is exposed) and hazard (the potential health effects of a pesticide) from all substances that share a common pathway of toxicity.

•Issued the science policy on *Cumulative Hazard and Dose-Response Assessment for Organophosphorus Pesticides* in August 2001.

www.epa.gov/pesticides/cumulative

Bacillus thuringiensis (Bt) Reassessment

•Completed comprehensive reassessment of conditionally registered, genetically engineered Bt corn, cotton, and potato products. Solicited scientific peer review and public comment on the draft reassessment.

•Held a public briefing to present the final reassessment and potential regulatory options for conditionally registered Bt products.

•Sought and made available to the public data on the potential effects of Bt corn on monarch butterflies. The data that were analyzed showed "no significant risk" to monarch butterflies from the use of Bt corn.

•Made provisions to strengthen insect resistance management, increase grower awareness and compliance, and continue Bt research.

•Required registrants to conduct monitoring of potential impacts from the continued use of the products.

•Required registrants to educate growers about their responsibilities in planting and harvesting plant-incorporated protectants.

www.epa.gov/pesticides/biopesticides

Advancements in Science and Technology

www.epa.gov/pesticides/science.htm

Test Methods for Public Health Pesticides

•Developed guidance for Agency scientists to use while reviewing new protocols for testing the efficacy of pesticides.

•Eliminated phenol-resistance tests for disinfectants and pesticides used as sanitizers because it was difficult to maintain and propagate test cultures to obtain consistent results.

New Tools for Estimating Ecological Risks

•Developed preliminary terrestrial and aquatic probabilistic models which estimate the magnitude, probability, and certainty of ecological risk. These models were strongly supported by the Scientific Advisory Panel (SAP) and well received by the international community. They are currently being revised based on internal and peer review comments.

•Developed a case study for refining risk assessments which was peer reviewed and strongly supported by the SAP.

•Sponsored a workshop on refining the risk assessment of the pesticide atrazine, where the registrant's risk assessment was analyzed.

•Provided training on refining risk assessments to scientists and risk managers making decisions.

Enhancements to OPP's Web Site www.epa.gov/pesticides

- Searchable database for FIFRA Section 18 Emergency Exemptions: www.epa.gov/opprd001/section18
- Searchable database for Food and Feed Commodity Vocabulary: www.epa.gov/pesticides/foodfeed
- 'Test Your Knowledge' on the kids' Web site: www.epa.gov/opptintr/kids/hometour
- Tolerance Reassessment page that tracks actions and offers reports: www.epa.gov/pesticides/tolerance
- Pesticide Product Label System (PPLS) database index: www.epa.gov/pesticides/pestlabels
- Pesticide Analytical Methods and Procedures: www.epa.gov/oppbead1/methods
- Pesticide Product Information System (PPIS) (updated): www.epa.gov/opppmsd1/PPISdata/index.html
- Public-Private Partnerships for Reducing Pesticide Risk Web site: www.epa.gov/opppmsd1/partnerships
- Integrated Pest Management Web site: www.epa.gov/opppmsd1/ipm/index.htm
- Models for estimating pesticides in ground and surface waters, with spray drift scenarios: www.epa.gov/oppefed1/models/water/index.htm

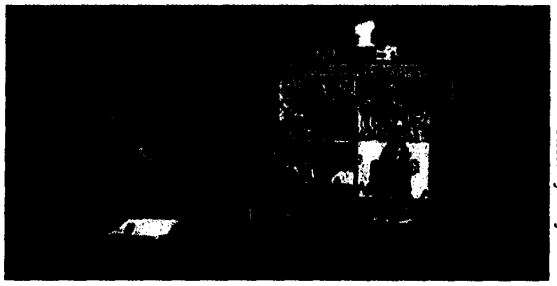


Photo by Sony

In FY 2001, INTERNATIONAL VIDEO TELECONFERENCING CAPABILITY WAS ADDED, REDUCING TRAVEL EXPENSES AND ALLOWING MORE STAFF TO PARTICIPATE IN MEETINGS WITH OTHER COUNTRIES. THE FIRST INTERNATIONAL TELECONFERENCE WAS WITH INDIA.

Pesticide Registration (PR) Notices

1/01 - PR Notice 2001-1- First Aid Statements on Pesticide Product Labels

1/01- PR Notice 2001-2 - Acute Toxicity Data Requirements for Granular Pesticide Products, Including Those with Granular Fertilizers in the Product

1/01- PR Notice 2001-3 - Insect Repellents: Labeling Restrictions for Use on Infants and Children and Restrictions on Food Fragrances and Colors.

1/01- Draft PR Notice for public comment - Describes how to label pesticide products for National Organic Program.

6/01- PR Notice 2001-4 - Elimination of Phenol Resistance Testing for Antimicrobial Disinfectant and Sanitizer Pesticides

8/01- PR Notice 2001-5 - Provides guidance for Pesticide Registrants on Pesticide Resistance Management Labeling

8/01 - Draft PR Notice for public comment - Spray and Dust Drift Label Statements for Pesticide Products

9/01 - PR Notice 2001-6 - Disposal instructions on Residential Household Use Products

10/01 - Draft PR Notice for public comment - Pesticide Registration (PR) Notice and Standard Operating Procedure for Submitting, Processing, and Reviewing Requests for Threshold of Regulation.

Final Regulations

7/01 - Regulating Plant-incorporated Protectants

Partners and Stakeholders Working Together

Pesticide Environmental Stewardship Program (PESP)

•Under PESP partnership, provided funding for the National Council of Farmer Cooperatives to explore how farmer cooperatives can play a greater role in developing, promoting, and marketing biopesticides and other "reduced-risk" pesticide alternatives in the best interest of their members. For example, the National Grape Cooperative and a registrant held field trials and a grower field day to demonstrate how to use the harpin protein product, Messenger®, and how to increase crop yields. This product uses natural defense mechanisms against a broad spectrum of viral, fungal, and bacterial diseases,

•With the American Farmland Trust, provided funding to pear growers in Washington's Yakima Valley who experimented with pheromones to disrupt the mating and reproduction of codling moths. Between 1997 and 2001, the growers' use of pheromones reduced their organophosphate use by over 30 percent (an average savings of $22/acre) and increased the effectiveness of pest control as well as the quality and quantity of their pears.

•Provided funding to PESP partner Lodi-Woodbridge Wine Grape Commission, which developed and is implementing the *Lodi Wine Growers Workbook: A self-assessment of integrated farming practices (IFP).* The workbook addresses pest management practices, including, monitoring and using economic thresholds, selecting pesticides, determining alternatives to pesticide use, calibrating sprayers, ensuring worker safety, and properly storing pesticides.

The Commission is distributing the workbook in small workshops of 5-10 growers at a time. Growers can use the workbook as a tool to develop their own action plan, and the workbook also provides a baseline measure of the integrated farming practices adopted for measuring future progress.

www.epa.gov/oppbppd1/partnerships

IR-4/Cal-DPR/EPA Workshare

• A partnership funded by EPA, IR-4, and the California Department of Pesticide Regulation (Cal-DPR) resulted in establishing tolerances for 51 new uses of pesticides for minor use crops. With crop-group tolerances, this will allow for the registration of approximately 200 crop uses. In this workshare project, Cal-DPR reviews IR-4 residue data, and EPA ultimately establishes tolerances measuring future progress.

Partners to Divert StarLink Corn from the Food Supply

•Worked with food industry and federal partners (USDA, FDA, and CDC) to identify and divert from the food supply trace amounts of StarLink corn, the *Bacillus thuringiensis* (Bt) corn product that was registered for animal feed and industrial uses but not for human consumption (a limited registration). Efforts coordinated to address the StarLink issue included the following:

–Canceled StarLink registration at the registrant's request.

–Announced that the Agency would no longer grant limited registrations for plant-incorporated protectants as was done for StarLink.

–Determined that there was not enough scientific evidence to justify granting a limited tolerance for the remaining traces of StarLink corn in the food supply.

–Required extensive testing of corn grain for the presence of StarLink.

–Held two Scientific Advisory Panel meetings to review the scientific assessments on exposure and allergenic potential of the protein Cry9C.

–Investigated reports of allergic reactions to corn products. The Centers for Disease Control and Prevention was able to determine that food containing StarLink corn did not cause any allergic reaction in people who reported having reactions after consuming corn products. The Agency believes the risks of allergenicity, if any, are extremely low.

•Conducted a thorough analysis of the wet milling process of StarLink corn, enabling the Agency to conclude that there is virtually no detectable presence of any protein in corn products produced by wet milling.

www.epa.gov/pesticides/biopesticides

Partners in Assessing Pesticide Use

•Engaged stakeholders in assessing actual use and potential benefits of more than 40 uses of two important organophosphate (OP) pesticides undergoing reregistration.

•Communicated regularly with crop experts and groups concerned about pesticide use to gain more understanding of crop practices, pests, and pest control options. Stakeholders were encouraged to review and comment on the draft benefits assessments which were posted on OPP's Web site at www.epa.gov/pesticides/cumulative.

Consumer Labeling Initiative (CLI)

•Continued to implement the CLI's "Read the Label First" consumer education campaign with regional, tribal, state, and local pesticide regulators and educators:

–Distributed over 55,000 promotional items with the EPA logo and phone number for the National Pesticide Information Center (NPIC), formerly the National Pesticides Telecommunications Network (NPTN), to consumers and pesticide applicators across the country.

–Displayed CLI exhibit at eight national level events.

–Included the "Read the Label First" logo in a truck ad campaign.

–Published the poster, "Use These Products Safely."

–Provided a grant to the National Safety Council for further outreach efforts.

www.epa.gov/oppt/labeling.htm

Pesticide Regulatory Education Program

•Sponsored, with OECA, five training programs for state regulatory officials to promote better understanding of pesticide issues.

Pesticide Handlers and Worker Protection

•Began a national assessment to evaluate and suggest improvements to pesticide worker protection activities by conducting workshops attended by stakeholders including states, EPA regions, and worker advocates.

•Held a national Pesticide Applicators Training and Certification Workshop with Texas extension agents and representatives from Canada and Mexico to discuss greater coordination of agricultural workers protection efforts and the development of a core examination for pesticide applicators in Canada and the United States.

www.epa.gov/oppfead1/safety

Tribal Partners

• Provided funding, for the sixth year, to eligible tribal governments or inter-tribal consortia that are working on or plan to carry out projects in support of the development of a pesticide program on tribal lands.

•Piloted a project on Native American reservations in Arizona, Washington, and Idaho, to educate healthcare providers in identifying, treating, and preventing acute pesticide poisonings.

Partners to Protect the Food Supply from Pesticide Misuse

•EPA reinforced partnerships with other federal, state, and local government agencies, and pesticide manufacturers to protect the U.S. food supply from the improper use of the restricted-use pesticide zeta-cypermethrin. Sold under trade names Fury® and Mustang®, zeta-cypermethrin was illegally applied to wheat in Mississippi and Arkansas. EPA and FDA led negotiations with the registrant that resulted in an unprecedented multimillion-dollar wheat buy-back agreement.

CCA-Treated Wood

•Reached an agreement with the American Wood Preservers Institute (AWPI) to increase safety for individuals who handle CCA-treated wood:

–Wood preservers volunteered to label CCA-treated wood.

–Retailers volunteered to display signs over storage bins containing such wood and to distribute consumer safety information sheets to buyers of CCA-treated wood.

–EPA and AWPI made available CCA information on Web sites and publicized toll-free numbers to AWPI and NPIC.

www.epa.gov/pesticides/citizens/1file.htm

Pilot Drinking Water Monitoring Program with U. S. Geological Survey (USGS) and USDA

•Designed a pilot drinking water program to collect surface water monitoring data at five sites in the United States. Information from the program will help the Agency better understand how frequently pesticides should be monitored in drinking water.

•Obtained results from OPP-USGS study measuring concentrations of 197 pesticides and their breakdown compounds in drinking water. The results will be applied to mathematical models used to estimate exposure in pesticide registration and reregistration.

•Worked with USDA to develop 45 standard crop scenarios for use in assessing pesticide exposures in surface water. These scenarios will make OPP's water assessments for different pesticides consistent with respect to the specific crop and the soil in which it is grown.

•Working with USGS, OPP completed the pilot reservoir program which monitored raw and finished water in 12 reservoirs across the United States. The results of this monitoring study were analyzed and made public in 2001. The index reservoir scenario was also incorporated into the Agency's aquatic exposure models to refine drinking water assessments.

USGS and EPA Partner to Protect Endangered Species

•Initiated work under an Interagency Agreement for cartographic services to develop county-level maps aimed at protecting endangered species. Geographic Information System (GIS) county-level maps depict species habitat where pesticide use may be limited to protect listed endangered species.

• In coordination with USGS, began developing for public use information bulletins containing county maps, specific steps pesticide users can take to protect the endangered species, and the specific pesticide uses that may be limited.

Report on State and Local Partners' Clean Sweep Programs

•Documented state and local programs' successes across the country in collecting unwanted agricultural pesticides. Over the past 20 years, more than 24 million pounds of pesticides that otherwise could wind up as pollution have been collected and properly disposed of or recycled.

A report on these cooperative programs examines success from national, state, and local perspectives and will be available by March 2002. A description of each Clean-Sweep program offers information on funding, operations, costs, and successes.

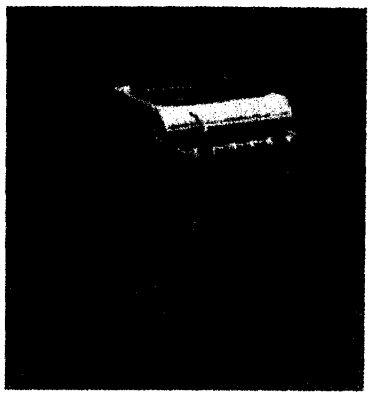
Building Laboratory Capacity for Testing Antimicrobials

•Worked to develop the capacity for state laboratories to test the efficacy of hospital-strength antimicrobial products. Four state laboratories–Ohio, Michigan, California, and Mississippi–received cooperative agreement funds from EPA's Office of Enforcement and Compliance Assurance (OECA) to assist in the Agency's Antimicrobial Post-Registration Testing Program. At EPA's Environmental Science Center (ESC), OPP hosted three hands-on laboratory training sessions covering methods for testing the efficacy of these products.

www.epa.gov/oppbead1

Dental Unit Waterline Treatments

•Coordinated efforts with industry, government, and academia to develop protocols for testing antimicrobial treatments to prevent microorganism contamination of dental unit waterlines. These units deliver coolant water for high-speed dental handpieces, air-water syringes, and ultrasonic scalers.



WATERLINE SYSTEM USED IN DENTAL OFFICE HOOKS TO DENTAL HANDPIECES, AIR-WATER SYRINGES, AND ULTRASONIC SCALERS.

Photo by Kristy Politte

OPP's Kathy Seikel at the Boy Scout Jamboree in August 2001. Scouts learned about pesticides and earned Public Health Merit Badge.

Integrated Pest Management (IPM) in Schools

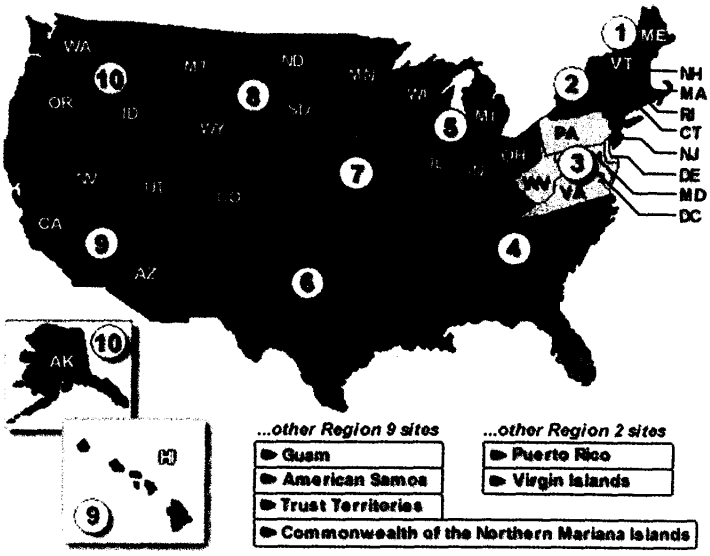
•Funded the opening of two pilot IPM in Schools centers–Texas A&M and Purdue University (encompassing nine states) to help promote the safe use of pesticides in schools. Staff from the centers visited schools and provided training in pest management, disseminated information, created Web sites, and opened toll-free telephone lines to answer questions from school officials.

• Partnered with EPA's Region 9 to initiate an IPM in Tribal Schools pilot program at several Bureau of Indian Affairs (BIA) schools on the Navajo reservation. The long-term goal of this project is to provide reference materials and assistance to any tribe interested in implementing IPM practices at a tribal school.

www.epa.gov/oppbppd1/ipm/index.htm

EPA's Regional Offices Where You Live
www.epa.gov/epahome/whereyoulive.htm

EPA has10 Regional Offices. Each EPA Regional office is responsible within its states for the execution of the Agency's programs.



Global Partners

•Helped negotiate a global convention, signed by more than 90 countries to date, reducing and/or eliminating production, use, and release of 12 pesticides of global concern and establishing a mechanism by which additional pesticides may be added in the future.

•Worked with the Mexican Government to develop a national "Train-the-Trainer" educational and outreach program to promote pesticide safety in Mexico.

•Strengthened with Canada and Mexico the North American framework for regulating pesticides, which promotes a stringent standard for protecting human health and the environment while providing equal access to pest control tools throughout North America.

•Worked with Canada to develop a proposal for updating nontarget plant toxicity testing requirements. This tiered testing scheme was peer reviewed, and comments are being incorporated into OPP's proposal.

•Joined Canada and Mexico on the first successful trilateral review of a pesticide application.

•Participated in an Organization for Economic Cooperation and Development Workshop on Pesticide Reviews that explored ways to increase the efficiency of agricultural pesticide evaluations through improved international cooperation.

•Coordinated U.S. participation in achieving final consensus on the Globally Harmonized System for Chemical Hazard Classification and Labeling, which promotes safer transportation, handling, and use of chemicals, and reduces trade barriers.

www.epa.gov/oppfead1/international

Subscribe to our automated mailing list to receive *Pesticide Program Updates* about pesticide regulatory activities:

www.epa.gov/oppfead1/cb/csb_page/form/form.html

New Publications

www.epa.gov/oppfead1/Publications/catalog

1. *Home, Safe Home* - Poster promoting appropriate pest control and pesticide safety (English and Spanish), September 2001.

2. *Socorro! Una Cucaracha!* - Spanish translation of children's cockroach activity book, March 2001.

3. *Report on Minor Use Pesticides*, May 2001.

4. *FY 2000 Annual Report*, August 2001.

For general questions on pesticides and pesticide poisoning prevention, contact the National Pesticide Information Center (NPIC), formerly the National Pesticides Telecommunications Network:

Telephone: 1-800-858-7378

E-mail: npic@ace.orst.edu

Web site: http://npic.orst.edu/

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Office of Prevention, Pesticides
and Toxic Substances (H7101)
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735-R-01-004
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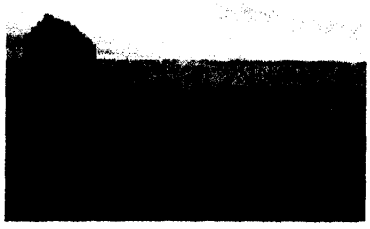

Amber Waves of Grain