Table 4. (continued)

Progenies	No. of tillers/plant	No. of capsules/plant	1000 seed wt. (g)	Yield/plant (g)	Days to 50% flowering
1	2	3	4	5	6
F_2 progenies					
7 X 10	6.89	67.23	6.54	2.46	50.22
8 X 9	9.32	55.90	7.15	2.28	56.22
8 X 10	8.72	56.76	6.95	2.12	56.56
9 X 10	8.27	68.28	6.99	2.35	54.89
S.E. ±	0.562	4.666	0.284	0.200	0.933

parents is the determination of the breeding value of the parents by the relative performance of their F_2 generation progeny bulks.

Literature

Anand, I.J.; Murty, B.R. (1969): Performance of heterozygotes in presence of reciprocal and maternal effects in diallel crosses of linseed. Indian J. Genet. 29, 363-372

Bhullar, G.S.; Gill, K.S.; Khehra, A.S. (1979): Combining ability analysis over F_1-F_5 generations in diallel crosses of bread wheat. Theor. Appl. Genet. 55, 77-80

Griffing, B. (1956): Concepts of general and specific combining ability in relation to diallel crossing systems. Austr. J. Biol. Sci. 9, 463-493

Jensen, N.F. (1970): A diallel selective mating system for cereal breeding. Crop Sci. 10, 629-650

Liang, G.H. (1967): Diallel analysis of agronomic characters in grain sorghum, *Sorghum vulgare* Pers. Canad. J. Genet. Cytol. 9, 269-276

Matzinger, D.F.; Sprague, G.F.; Cockerham, C.C. (1959): Diallel cross of maize in experiments repeated over locations and years. Agron. J. 51, 346-350

Paroda, R.S.; Joshi, A.B. (1970): Genetic architecture of yield and components of yield in wheat. Indian J. Genet. 30, 298-314

Patil, V.D. (1980): Genetics of yield and yield components in linseed. Ph. D. Thesis Marathwada Agricultural University, Parbhani, India

Redden, R.J.; Jensen, N.F. (1974): Mass selections and mating systems in cereals. Crop Sci. 14, 345-50

Shehata, A.H.; Comstock, V.E. (1971): Heterosis and combining ability estimates in F_2 flax population, as influenced by plant density. Crop Sci. 11, 534-536

Singh, D. (1973): Diallel analysis for combining ability over several environments. Indian J. Genet. 33, 469-481

Received April 15, 1980
Communicated by A. Kahler

Prof. V.D. Patil, Reader
Prof. P.R. Chopde, Dean
Department of Genetics & Plant Breeding
Marathwada Agricultural University
Parbhani 431 402 M.S. (India)

Book Reviews

Gunther, F.A.; Davies Gunther, J. (eds.): Residue Reviews. Residues of Pesticides and other Contaminants in the Total Environments, Ed. Vol. 74, 75, 76. Berlin-Heidelberg-New York: Springer 1980. 138/189/218 pp. 23/50/30 figs. 33/35/24 tabs. Hard bound DM 49.–/54.–/54.–.

Vol. 74 of Residue Reviews contains 3 comprehensive papers, 'Molybdenum in the environment', by W.M. Jarrell, A.L. Page and A.A. Elseewi dealing with the following topics: production and uses of Mo; natural occurences in minerals, rocks, soils and waters; Mo in plant, animal and human nutrition, its essentiality, toxicity and factors influencing Mo uptake by plants; sources of Mo enrichment in the environment, soils, waters, atmosphere and management of high-Mo wastes. In the review 'Fate of polychlorinated biphenyls (PCBs) in soil-plant systems' by D. Pal, J.B. Weber and M.R. Overcash the following aspects are given: chemical structure, production and use, distribution, toxicity and historical perspective; microbial decomposition and stability in soils including rates and metabolites; photodecomposition, volatilization, soil adsorption, leaching and run-off, including water solubilities and octanol partition coefficients; plant uptake, effects and metabolism of PCBs in plants and factors affecting the behavior in soil-plant systems. Analytical methods for dealing with special fungicides are reviewed in brief in the paper 'Fungicides for gray-mold control: A critical review of analytical methods for formulation and residue analysis' by A. Del Re, P. Fontana, G.F. Marchini et al. TLC, spectrophotometry, HPLC, GLC, other techniques and, in some cases, polarography and paper chromatography are discussed for the following compounds: Captan, Folpet, Captafol and Chlorothalonil; Benomyl, MBC, Thiophanate, Thiophanate-methyl and Thiabendazole; Dichlorfluanid and Tolylfluanid; Carboxin and Oxycarboxin; 3,5-Dichloroaniline derivatives; Sclex, Dimethachlon, Vinclozolin and Sumisclex; Dichlone; Tridemorph; Pyrazophos; Pyridinitrile; sec-Butylamine; Triforine.

Vol. 75 of Residue Reviews is dedicated to the Research Conference and Workshop on minimizing occupational exposure to pesticides, held on February 19-21, 1980 at Tucson, Arizona, USA. Fourteen papers and summaries and recommendations of the conference are given (Chairman F.A. Gunther, Vice-Chariman G.W.

Ware, Secretary R.J. Foster, invited advisors J.B. Knaak and Y. Iwata). Specific conclusions and recommendations are given to the topics: populations at risk, personnel monitoring, urinary metabolites, cholinesterase testing, techniques for establishing safe levels of foliar residues, federal reentry standards (present and proposed), reliability of analytical methodology, reentry field data and conclusions, closed systems, protective clothing, worker safety from an industrial viewpoint. The papers given and their contents are: *Minimizing occupational exposure to pesticides:* 1) epidemiological overview – exposure instruments, mixed pesticide exposure study, single pesticide exposure study and results. 2) Populations at exposure risk-routes of exposure and reported illnesses, groups exposed-ground applicators, gardeners and nurserymen, warehousemen, field workers, formulators and manufacturers, policemen and firemen, fumigators, aerial applicators. 3) Personnel monitoring – preparation for the field study, selection of methodology for dermal, hand and respiratory exposure, validation of methodology for efficiency of extraction, dermal exposure pad location, field operations and exposure assessment from the results of measurements. 4) Recent developments in methodology for monitoring pesticide metabolites in human urine – triazine metabolites, alkylphosphate metabolites, phenols and anilines. 5) Cholinesterase determination and organophosphorus poisoning – ChE monitoring in WHO field trials of new insecticides, review of results obtained, problems related to sampling and transportation of samples from the field. 6) Techniques for establishing safe levels of foliar residues – procedures for setting safe levels on foliage, relations between dermal dose and ChE response and behavior in animals, dermal absorption, distribution, metabolism and excretion studies in animals and man. 7) Acute and chronic effects of pesticides on human health – acute systemic poisoning, incipient toxicity, basic mandate. 8) Federal reentry standards for farm workers (present and proposed) present standards set by EPA, California's regulations for farm worker safety, proposed methodologies for determining reentry intervals, the nondetectable residue and the minimal risk residue approach. 9) Reliability of analytical methodology – blood, urine and breath analysis, environmental analyses of airborne, dislodgeable and soil loose residues, competency of analysts, analytical errors and losses. 10) Reentry field data: a recapitulation – routes of worker exposure to residues, importance of soil dust, collection of residue data, examples of residue data available, approaches to minimizing worker exposure to residues. 11) Closed systems and worker safety-definition and history, development, initial regulation, merits and demerits, current regulation. 12) Repellency and penetrability of treated textiles to pesticide sprays – application of aqueous-based and solvent based formulations of fluoroaliphatic resins to cloth, air-dried and heat-cured, penetration studies with different pesticides, results and comments. 13) Worker safety, from an industrial viewpoint – development of new pesticides, safe use information, costs and benefits.

This volume of Residue Reviews is recommended for all scientists working in different aspects of pesticide science including chemists, agriculturists, biologists, public health physicians, epidemiologists and dermatologists.

Vol. 76 of Residue Reviews contains papers dealing with different aspects of pesticides and foreign chemicals. 'Environmental and metabolic transformations of primary aromatic amines and related compounds' by G.E. Parris comprises the following subtopics: oxidation of anilines in soil and microbial cultures, reduction of nitro and azo groups, condensation of nitroso groups, reactions involving environmental nitrite, acylation of aromatic amines, methylation of aromatic amines, photochemistry, covalent binding to soil organic matter, metabolism in higher organisms. In the paper 'Conjugation of foreign chemicals by animals' by G.D. Paulson conjugation reactions are classified as follows: glucuronic acid and other carbohydrates, sulfate ester, glutathione and mercapturic acid, methylation, acylation, amino acid conjugation, phosphate and other miscellaneous conjugation reactions, factors affecting conjugation reactions. 'Microbial agents as insecticides' by J.W. Cherwonogrodzky is a review discussing the mode of action, field trials and toxicity and pathogenicity of fungi, protozoa, rickettsiae, viruses and bacteria.

The following papers were given on the US-ROC on environmental problems associated with pesticide usage in the intensive agriculture system, April 7-17, 1979, Taipei, Taiwan. Papers on selected topics were presented in four sessions: 1) monitoring pesticide residues in the environment and in food, 2) pesticide degradation, 3) chemistry and 4) effects on nontarget organisms. 'Bioassay as a monitoring tool' by G.K. Kohn gives the subtopics: problems and limitations of the bioassay monitoring of residues, particular residue monitoring considerations, general methods for insecticide analysis, bioassay of fungicidal and bacterial residues, herbicide bioassay'. Insecticide resistance and prospects for its management' by G.P. Georghiou is a short paper comprising problems of resistance, mainly of organophosphates, and chemical countermeasures as synergists, insecticide mixtures and rotation. E.P. Lichtenstein discusses in the paper 'Bound residues in soils and transfer of soil residues in crops' the problems of unextractable, bound insecticide residues in soils, their potential release and transfer into crops. Most of the model experiments were performed with ^{14}C-labelled parathion. Experiments with 6 insecticides of water solubilities between 0.001 and 320 ppm revealed the importance of this parameter; most of the compounds were picked up from sandy soils treated with compounds of a high water solubility. F.A. Gunter gives a comprehensive discussion of 'Interpreting pesticide residue data at the analytical level'. 'Effects of pesticides on nontarget organisms' were summarized by G.W. Ware in the subtopics: biological interactions as biomagnification, liver enzyme induction, wildlife and domestic animals, agricultural arthropods, pollinators, soil organisms, aquatic microorganisms and plankton, and plants. J.W. Hylin discusses in brief 'Pesticide residue analysis of water and sediments: potential problems and some philosophy'.

W. Dedek, Leipzig