

Air-Assisted Spraying in Crop Protection

BCPC Monograph No. 46

Proceedings of a Symposium organised by
The British Crop Protection Council and
The Association of Applied Biologists held at the
University College of Swansea, UK
7th–9th January, 1991

Edited by **A. Lavers, Pamela Herrington and
E. S. E. Southcombe**

BCPC Registered Office
49 Downing Street
Farnham, Surrey GU9 7PH, UK



Contents

	Page
PREFACE	viii
PROGRAMME COMMITTEE	ix
CHAIRMEN OF SESSIONS	x
ABBREVIATIONS	xi
1. PHYSICS AND ENGINEERING	1
Review of air-assisted Spraying	
E. C. HISLOP	3
Patternation of spray mass flux from axial fan airblast sprayers in the orchard	
J. V. CROSS	15
Development criteria for an air assisted ground crop sprayer	
E. HADAR	23
Development of practice-orientated control test methods for orchard spray machines by means of a vertical test stand	
K. KÜMMEL, H. GÖHLICH, O. WESTPHAL	27
Methods of creating air-assisting flows for use in conjunction with crop sprayers	
P. C. H. MILLER, P. A. HOBSON	35
Practical aspects of design and practical testing of orchard sprayers	
S. PLANAS, L. PONS	45
2. ENVIRONMENT, HEALTH AND SAFETY	53
Some implications of recent legislation for air-assisted spraying	
T. R. FAULL	55
Pesticide drift from air-assisted orchard sprayers – a numerical simulation study	
P. J. WALKLATE	61
Drift of charged and uncharged spray droplets from an experimental air-assisted sprayer	
N. M. WESTERN, E. C. HISLOP	69
A method for assessing the drift potential of hydraulic nozzle spray clouds, and the effect of air assistance	
B. W. YOUNG	77
3. AIR-ASSISTED SPRAYING IN FIELD CROPS	87
Early studies on spray drift, deposit manipulation and weed control in sugar beet with two air-assisted boom sprayers	
M. J. MAY	89
The performance characteristics of a twin fluid nozzle sprayer	
P. MILLER, C. R. TUCK, A. J. GILBERT, G. J. BELL	97
Field experiences with a twin fluid spraying system	
D. NETTLETON	107
The effect of air assistance and spray quality (drop size) on the availability, uniformity and deposit on contrasting targets	
E. NORDBO, W. A. TAYLOR	113
Enhancing conventional hydraulic nozzle use with the Twin Spray System	
W. A. TAYLOR, P. G. ANDERSON	125

	Review of the use of a twin fluid spray system on a Berkshire farm from 1987 to 1990	
	H. L. WILSON	137
4.	AIR-ASSISTED SPRAYING OF TREE AND BUSH CROPS	141
	Improved performance of mist-blowers for orchard and hop spraying using electrostatic charging	
	J. G. ALLEN, A. SMITH, D. J. BUTT, T. M. WARMAN	143
	The use of air-assisted hand held ULV sprayers for the control of Coffee Leaf Rust in Columbia	
	R. ASTON, D. G. SHARP AND J. S. CLAYTON	151
	Current status of foliar pesticide application to cane and bush fruit crops in Europe	
	S. C. GORDON, B. WILLIAMSON, W. A. TAYLOR	161
	Orchard geometry, pesticide placement and drift	
	F. R. HALL, J. A. COOPER AND D. C. FERREE	171
	Evaluation of knapsack mistblowers for the control of Coffee Leaf Rust in Papua New Guinea	
	P. JOLLANDS	177
	Comparison of different mist-blower sprayers and volume rates in orchard spraying	
	U. RAISIGL, H. FELBER, W. SIEGFRIED, CH. KREBS	185
	Cover/concentrate/control correlations (C.C.C.C). What are the implications?	
	M. RAS	197
	Development, evaluation and conversion of Micronair for use as an orchard sprayer	
	T. SANDER	203
	The development of an unmanned covered air-assisted sprayer for orchard crops	
	J. VAN de WERKEN	211
	Optimisation of spraying methods for fruit trees with reduced use of chemicals	
	H. WIEDENHOFF	219
5.	AIR-ASSISTED SPRAYING IN COVERED CROPS, WAREHOUSES AND PUBLIC HEALTH	225
	Air-assisted spraying under glass	
	A. ADAMS, R. K LINDQUIST	227
	Air-assisted application of bendiocarb ULV for insect control in buildings	
	C. J. BOASE	237
	Mosquito control using mist blower sprayers for residual deposit of bendiocarb ULV in Mexico	
	J. GOOSE	245
6.	POSTERS	249
	Deposit assessments with various air-assisted sprayers in strawberries	
	M. BARNETT	251
	Deposit assessment with a prototype electrostatically charged air-assisted spinning disc sprayer in apples	
	J. CLAYTON AND E. BALS	255
	Deposits on apple leaves from medium volume, low volume and very low volume spray applications with an axial fan sprayer	
	J. V. CROSS	263

Caliset: safety and ecology in a holdall U. RAISIGL AND H. FELBER	269
Assessment of rotary atomiser attachments for motorised knapsack mistblowers A. HEWITT	271
Foliar distributions of air-assisted spray deposits in a potato canopy W. JEFFREY AND W. A. TAYLOR	273
Manipulation of spray deposits on cereals with air assistance W. JEFFREY AND W. A. TAYLOR	275
The use of vehicle-mounted air-blast sprayers for the control of Coffee Berry Borer in New Caledonia C. S. PARKIN, L. O. BRUN, V. GAUDICHON AND C. MARCILLAUD	277
Air velocity profiles around mist-blowers M. C. D. RAS	287
Changing spray deposits from horizontal to vertical surfaces at ground level within cereal rows using air-assistance R. RINGEL, W. TAYLOR AND P. G. ANDERSON	297
A portable device for the assessment of impacted droplets R. ROBINSON	299
Dramatic reduction of environment pollution and spray volumes in orchard spraying by using Noric Rotary Atomisers in a Joco Tunnel Sprayer N. de SCHAEZTEN	301
Spray cloud vortex formations B. YOUNG AND W. TAYLOR	303
The effects of air assistance on the distribution of spray drops on targets N. A. MORGAN	305