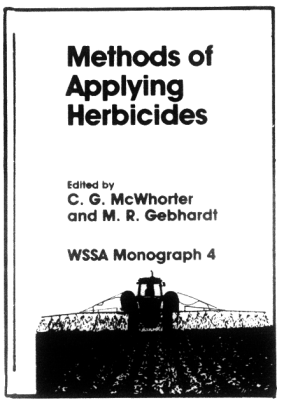
Methods of Applying Herbicides



The WSSA announces publication of the most comprehensive monograph ever published in the United States on methods of applying herbicides. METHODS OF APPLYING HERBICIDES contains 22 chapters that total 360 pages. Chester G. McWhorter and Maurice Gebhardt served as Editors and Stephen O. Duke served as Technical Editor. The monograph documents the state-of-the-art methods of applying herbicides and projects future needs for new and improved application technology. This is the first WSSA monograph to be indexed. The extensive indexing, 8 pages, will greatly aid in making this your most valuable reference on methods of applying herbicides.

The monograph was made possible by 32 authors who are technical experts in their respective fields. Chapters included in the monograph are:

1. Introduction to Herbicide Application Technology
2. Herbicide Properties and Processing Affecting Application
3. Relationship of Plant Morphology to Herbicide Application and Absorption
4. Herbicide Interactions with Herbicides and Other Agricultural Chemicals
5. Application Accuracy
6. Spray Application Technology
7. Rotary Atomization
8. Aerial Application
9. Electrostatic Spraying
10. Applying Herbicides Through Irrigation Systems
11. Granular Formulations and Application
12. Controlled Release Herbicides
13. Application of Herbicides in Fertilizers
14. Wiper Application
15. Incorporation and Injection of Herbicides into the Soil
16. Herbicide-Treated Crop Seed
17. Production and Application of Biocontrol Agents
18. Herbicide Application Technology in Aquatic Weed Control
19. Application and Use of Herbicides in Forest and Industrial Right-of-Way Sites
20. Closed Systems for Mixing and Loading
21. Protective Apparel
22. Effect of Weather Factors on the Application of Herbicides

METHODS OF APPLYING HERBICIDES may be purchased at $35.00 per copy from the Weed Science Society of America, 309 W. Clark St., Champaign, IL 61820. Remittance to accompany order. Shipment will be made within 72 hours from receipt of order.

Quick Reference for Conversions Between SI and English Units

Volume			Volume/Area	
qt	L	gal	L/ha	gpa
1	1	0.3	1	0.1
2.1	2	0.5	2	0.2
3.2	3	0.8	3	0.3
4.2	4	1.1	4	0.4
5.3	5	1.3	5	0.5
6.3	6	1.6	6	0.6
7.4	7	1.8	7	0.7
8.5	8	2.1	8	0.9
9.5	9	2.4	9	1
11	10	2.6	10	1.1
21	20	5.3	20	2.1
32	30	7.9	30	3.2
42	40	11	40	4.3
53	50	13	50	5.3
63	60	16	60	6.4
74	70	18	70	7.5
85	80	21	80	8.6
95	90	24	90	9.6
106	100	26	100	11
211	200	53	200	21
317	300	79	300	32
423	400	106	400	43
528	500	132	500	53
634	600	159	600	64
740	700	185	700	75
846	800	211	800	86
951	900	238	900	96
1057	1000	264	1000	107
*1.057		*0.264		*0.107

Area*			
ha	A	cm^2	$inch^2$
0.1	0.25	10	1.5
0.2	0.49	20	3
0.3	0.74	30	5
0.4	1	40	6
0.5	1.2	50	8
0.6	1.5	60	9
0.7	1.7	70	11
0.8	2	80	12
0.9	2.2	90	14
1	2.5	100	16
2	5	200	31
3	7.4	300	46
4	10	400	62
5	12	500	77
6	15	600	93
7	17	700	108
8	20	800	124
9	22	900	139
10	25	1000	145
	*2.471		*0.155

Weight/Area				
			bu/A	
kg/ha	lb/A	ton/A	56 lb	60 lb
0.1	0.09			
0.2	0.18			
0.3	0.27			
0.4	0.36			
0.5	0.45			
0.6	0.54			
0.7	0.62			
0.8	0.71			
0.9	0.80			
1	0.89			
2	1.8			
3	2.7			
4	3.6			
5	4.5			
6	5.4			
7	6.2			
8	7.1			
9	8.0			
10	8.9			
20	18			
30	27			
40	36			
50	45			
60	54		1	
70	62			1
80	71			
90	80			
100	89		2	
200	178	0.1	3	3
300	268		5	
400	357		6	6
500	446	0.2	8	7
600	535		10	9
700	624	0.3	11	10
800	714		13	12
900	803	0.4	14	13
1000	892		16	15
2000	1784	0.9	32	30
3000	2676	1.3	48	45
4000	3568	1.8	64	59
5000	4460	2.2	80	74
6000	5352	2.7	96	89
7000	6244	3.1	111	104
8000	7136	3.6	127	119
9000	8028	4.0	143	134
10000	8920	4.5	159	149
11000	9812	4.9	175	164
12000	10704	5.4	191	178
13000	11596	5.8	207	193
14000	12488	6.2	223	208
15000	13380	6.7	239	223
	*0.892	*0.00045	*0.016	*0.015

Weight				
lb	kg	ton	g	ounce
0.2	0.1		1	0.04
0.4	0.2		2	0.07
0.7	0.3		3	0.1
0.9	0.4		4	0.14
1.1	0.5		5	0.18
1.3	0.6		6	0.21
1.5	0.7		7	0.25
1.8	0.8		8	0.28
2	0.9		9	0.32
2.2	1		10	0.35
4.4	2		20	0.7
6.6	3		30	1.1
8.8	4		40	1.4
11	5		50	1.8
13	6		60	2.1
15	7		70	2.5
18	8		80	2.8
20	9		90	3.2
22	10		100	3.5
44	20		200	7.1
66	30		300	11
88	40		400	14
110	50		500	18
132	60		600	21
154	70		700	25
176	80		800	28
198	90		900	32
220	100	0.1	1000	35
441	200	0.2		*0.0353
661	300	0.3		
882	400	0.4		
1102	500	0.5		
1323	600	0.7		
1543	700	0.8		
1764	800	0.9		
1984	900	1		
2205	1000	1.1		
4410	2000	2.2		
6615	3000	3.3		
8820	4000	4.4		
11025	5000	5.5		
13230	6000	6.6		
15435	7000	7.7		
17640	8000	8.8		
19845	9000	9.9		
22050	10000	11		
*2.205		*0.0011		

Temperature	
°C	°F
100	212
90	194
80	176
70	158
60	140
50	122
40	104
35	95
30	86
25	77
20	68
15	59
10	50
5	41
0	32
−5	23
−10	14
−15	5
−20	−4
−25	13
−30	−22
−40	−40
	*(9/5 C) + 32

Speed		Pressure	
km/h	mph	kPa	psi
1	0.6	50	7
2	1.2	75	11
3	1.9	100	14
4	2.5	125	18
5	3.1	150	22
6	3.7	175	25
7	4.3	200	29
8	5	225	33
9	5.6	250	36
10	6.2	275	40
20	12	300	43
30	19	325	47
40	25	350	51
50	31	375	54
60	37	400	58
70	43	500	73
80	50	600	87
90	56	700	101
100	62	800	116
	*0.6214	900	130
		1000	145
			*0.145

Length								
inch	cm	feet	feet	meter	yard	yard	km	mile
0.4	1		0.3	0.1	0.1	109	0.1	0.06
0.8	2		0.6	0.2	0.2	219	0.2	0.12
1.2	3	0.1	0.9	0.3	0.3	328	0.3	0.19
1.6	4		1.3	0.4	0.4	438	0.4	0.25
2	5		1.6	0.5	0.5	547	0.5	0.31
2.4	6	0.2	2	0.6	0.7	656	0.6	0.37
2.8	7		2.3	0.7	0.8	766	0.7	0.43
3.1	8		2.6	0.8	0.9	875	0.8	0.5
3.5	9		3	0.9	1	985	0.9	0.56
3.9	10	0.3	3.3	1	1.1	1094	1	0.62
7.9	20	0.6	6.6	2	2.2	*1094	2	1.2
12	30	1	9.8	3	3.3		3	1.9
16	40	1.3	13	4	4.4		4	2.5
20	50	1.6	16	5	5.5		5	3.1
24	60	2	20	6	6.6		6	3.7
28	70	2.3	23	7	7.7		7	4.3
32	80	2.6	26	8	8.8		8	5
36	90	3	30	9	9.8		9	5.6
39	100	3.3	33	10	11		10	6.2
79	200	6.6	66	20	22		20	12
118	300	9.8	98	30	33		30	19
157	400	13	131	40	44		40	25
197	500	16	164	50	55		50	31
236	600	20	199	60	66		60	37
276	700	23	230	70	76		70	43
315	800	26	262	80	87		80	50
354	900	30	295	90	98		90	56
394	1000	33	328	100	109		100	62
*0.3937		*0 0328	*3.281		*1.094			*0.6214

*Multiply the SI units by this factor to convert to English units for this column.

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Common and Trade Names and Manufacturers of Herbicides

Trade names and manufacturers listed are the original and/or most common source(s) of the herbicide listed. The list is provided as an aid to readers who are more familiar with trade names than common names. No attempt is made to include all trade names or manufacturers of a herbicide, nor is any discrimination implied against similar products available from other sources. A complete listing of common names, trade names, pronunciation, chemistry, trade names, and manufacturers is available on the back cover of *Weed Science* and/or in the *Herbicide Handbook* from the WSSA, 309 West Clark St., Champaign, IL 61820.

Common Name	Trade Name	Manufacturer
acetochlor	Harness	Monsanto
acifluorfen	Blazer	BASF
	Tackle	Rhone-Poulenc
alachlor	Lasso	Monsanto
ametryn	Evik	CIBA-Geigy
amitrole	Amitrol	Rhone-Poulenc
AMS	Ammate X-NI	DuPont
asulam	Asulox	Rhone-Poulenc
atrazine	several	several
barban	Carbyne	United Agri-Products
benefin	Balan	Elanco
bensulide	Prefar	ICI Americas
bentazon	Basagran	BASF
bensulfuron	Londax	DuPont
bifenox	Modown	Rhone-Poulenc
bromacil	Hyvar	DuPont
bromoxynil	Brominal	Rhone-Poulenc
	Buctril	Rhone-Poulenc
butachlor	Machete	Monsanto
buthidazole	Ravage	Sandoz
butylate	Sutan	ICI Americas
CDAA	Randox	Monsanto
chloramben	Amiben	Rhone-Poulenc
chlorimuron	Classic	DuPont
chloroxuron	Tenoran	CIBA-Geigy
chlorpropham	Furloe	PPG
chlorsulfuron	Glean	DuPont
clethodim	Select	Chevron
cinmethylin	Cinch	DuPont
clomazone	Command	FMC
cloproxydim		Chevron
clopyralid	Lontrel	Dow
cyanazine	Bladex	DuPont
cycloate	Ro-Neet	ICI Americas
dalapon	several	several
dazomet	several	several
DCPA	Dacthal	SDS Biotech
desmedipham	Betanex	Nor-Am
diallate	Avadex	Monsanto
dicamba	Banvel	Sandoz
dichlobenil	Casoron	Uniroyal
dichlorprop	several	several
diclofop	Hoelon	Hoechst-Roussel
diethatyl	Antor	Nor-Am
difenzoquat	Avenge	American Cyanamid
dinoseb	several	several
diphenamid	Enide	Nor-Am
dipropetryn	Sancap	CIBA-Geigy
diquat	Diquat	Chevron
diuron	Karmex	DuPont
endothall	Endothal	Pennwalt
EPTC	Eptam	ICI Americas
ethalfluralin	Sonalan	Elanco
ethofumesate	Nortron	Nor-Am
fenoxaprop	Whip	Hoechst-Roussel
flamprop	Mataven	Shell U.K.
fluazifop	Fusilade	ICI Americas
fluazifop-P	Fusilade 2000	ICI Americas
fluchloralin	Basalin	BASF
fluometuron	Cotoran	CIBA-Geigy
fluorochloridone	Racer	ICI Americas
fluoroglycofen		Rohm and Haas
fluridone	Sonar	Elanco
fomesafen	Reflex	ICI Americas
fosamine	Krenite	DuPont
glyphosate	Roundup	Monsanto
haloxyfop	Verdict	Dow
hexazinone	Velpar	DuPont
imazapyr	Arsenal	American Cyanamid
imazaquin	Scepter	American Cyanamid
imazethapyr	Pursuit	American Cyanamid
isopropalin	Paarlan	Elanco
isouron	Conserve	Elanco
isoxaben		Elanco
lactofen	Cobra	PPG
linuron	Lorox	DuPont
MAA	several	several
MCPA	several	several
MCPB	This-trol	Rhone-Poulenc
mecoprop	several	several
mefluidide	Embark	3M
metham	Vapam	ICI Americas
methazole	Probe	Sandoz
metolachlor	Dual	CIBA-Geigy
metribuzin	Lexone	DuPont
	Sencor	Mobay
metsulfuron	Ally	DuPont
MH	several	several
molinate	Ordram	ICI Americas
napropamide	Devrinol	ICI Americas
naptalam	Alanap	Uniroyal
norea	Herban	Nor-Am
norflurazon	Zorial	Sandoz
oryzalin	Surflan	Elanco
oxadiazon	Ronstar	Rhone-Poulenc
oxyfluorfen	Goal	Rohm and Haas
paraquat	Gramoxone	ICI Americas
pebulate	Tillam	ICI Americas
pendimethalin	Prowl	American Cyanamid
perfluidone	Destun	3M
phenmedipham	Betanal	Nor-Am
picloram	Tordon	Dow
profluralin	Tolban	CIBA-Geigy
prometon	Pramitol	CIBA-Geigy
prometryn	Caparol	CIBA-Geigy
pronamide	Kerb	Rohm and Haas
propachlor	Ramrod	Monsanto
propanil	Stam, Stampede	Rohm and Haas
propazine	Milogard	CIBA-Geigy
propham	Chem Hoe	PPG
pyrazon	Pyramin	BASF
pyridate	Tough	Gilmore
quizalofop	Assure	DuPont
sethoxydim	Poast	BASF
siduron	Tupersan	DuPont
simazine	Princep	CIBA-Geigy
sulfometuron	Oust	DuPont
tebuthiuron	Graslan	Elanco
terbacil	Sinbar	DuPont
terbutryn	Igran	CIBA-Geigy
thiobencarb	Bolero	Chevron
triallate	Far-go	Monsanto
triclopyr	Garlon	Dow
tridiphane	Tandem	Dow
trifluralin	Treflan	Elanco
2,4-D	several	several
2,4-DB	Butyrac	Rhone-Poulenc
vernolate	Vernam	ICI Americas

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