Spray Material Half-Life Chart 2009 AG

Adjusting the pH of the spray solution can reduce spray material decomposition and make the spray more effective.
The following chart shows the Spray Material Half-Life or the time it takes for half the amount of chemical to be decomposed (made inactive at various pH levels).

Spray Material Product	Buffering	Optimum pH	Half-Life at pH indicated (50% decomposition)					
			9,0 Basic	8,0 Basic	7,0 Neutral	6,0 Acidic	5,0 Acidic	4,5 Acidic
2,4-D Amine		6,0			Stable at pH 4.5 - 7.0			
Accel®		6,0			Strongly recommend pH 5.5 - 6.5			
Achieve®		7,0	>1000 days		114 days		63 days	
Acramite® *Updated 6-04*	X	6,0	10 min.		1 hr.	12 hrs.		20 hrs.
Acrobat®		7,0	Stable over wide range of pH					
Actara™ *Updated 8-04*		7,0	Susceptible to alkaline hydrolysis in pH >9.0					
Actellic®		7,0		12 days	35 days		7 days	
Admire® *Updated 4-08*		7,0	355 days	Fully stable at a pH of 5 and 9			30 days	
Agri-Mek®		7,0	Stable over wide range of pH					
Aliette®		6,0		Stable in pH 4.0 - 8.0				
Alverde® *Added 8-06*		7,0	Stable over wide range of pH above 4.0					
Amber®		7,0	Stable from 7.0 to 9.0				31 days	
Ambush®		7,0		Stable at pH 6.0 - 8.0				
Ammo®	X	4,0	35 hrs.		More stable in acidic solutions			
Apollo® *Updated 1-03*	X	6,0	4 hrs.		34 hrs.		248 hrs.	
Asana® *Updated 6-04*		6,5	Stable over a pH 5.0 - 9.0 range					
Assail™ *updated 4-08*		6,0	Unstable in water pH below 4.0 and above 7.0					
Atrazine		7,0	Decomposes slowly in base solution					
Auxigro®	X	6,0			Strongly recommend pH 5.5 - 6.5			
Avaunt®		7,0	Stable over wide range of pH					
Avenge®	X	5,0	Decomposes in strong base condition					
Banvel®	X	5,5				Stable at pH 5.0 - 6.0		
Basagran®		7,0	Stable over wide range of pH					
Bayleton®		7,0	Stable over wide range of pH					
Baythroid® *Added 4-08*			6 days	Stable over wide range of pH				
Beacon®		7,0	>900 days				6 days	
Betamix®		7,0	10 min.		17 hrs		60 days	
Bravo®		7,0	Stable over wide range of pH					
Buctril®	X	5,0	Hydrolysis above pH 7.0					
Cabrio™ EG		7,0	30 days					
Calypso® *Updated 1-05*		7,0	Stable over wide range of pH 5.0 to 9.0					
Canvas®		7,0	Do NOT lower pH of water					
Captan®	X	5,0		10 min.	8 hrs.		32 hrs.	
CaptEvat® *Added 8-04*	X	5,0		10 min.	8 hrs.		32 hrs.	
Capture® *Added 6-04*		6,0			Stable in pH 4.5 - 7.5			
Carzol®	X	5,0	2 hrs.		23 hrs.		4 days	
Classic®	X	5,0					Stable in pH 5.0 water	
Copper Products		>7.0			Do Not Use In water pH below 7.0			
Confirm®		7,0	Stable over wide range of pH					
Curzate® DF *Updated 3-03*		6,5		8 hrs.	Stable at pH 5.5 - 6.5			
Dacthal®		7,0	Hydrolized in strong acid and alkaline					
Decis® *added 4-08*		7,0	2 days	Stable from pH 5 to 8				
Delegate® added 11-09		7,0	Stable in pH from 5.0 to 9.0					
Des-i-cate®	X	5,0					Stable at pH 4.0 - 5.0	
Di-syston®		7,0	Stable over wide range of pH					
Diazinon		7,0	29 days	3 wks.	10wks.		14 days	8 days
Dibrom®	X	5,0	Hydrolized in 48 hrs. in pH > 7					
Digon® Dimethoate	X	5,0	48 mins.			12 hrs.		20 hrs.
Dipel®		6,0	Unstable in pH > 8					
Dithane®	X	5,5	34 hrs.		17 hrs.		20 days	
Diquat®		6,0			Stable in neutral or acid solutions			
Distinct®		7,0	Stable over wide range of pH					
Dursban®	X	5,0		1.5 days	35 days		63 days	
Dylox®	X	5,0		63 min.	6.5 hrs.	3.7 days		
Echo® / Bravo®		7,0	Stable over wide range of pH					
Elite®		7,0	Stable over wide range of pH					
Endura® *7-04*		6,8	Stable over wide range of pH					
Entrust® *added 9-07*		7,0	Stable in pH from 6.0 to 11.0				12 hrs.	
Ethrel® *updated 2-06*	X	7,0	Hydrolized under alkaline conditions					
Endosulfon		6,0	Some alkaline hydrolysis					
Envidor® added 4-08		7,0	2 days		Stable from pH 4 to 8			
Everest®		7,0	Stable over wide range of pH					
Express®		7,0	Do NOT lower pH of water					
Flint®		7,0	27 hours		Stable from pH 4 to 8			
Folicur®		7,0	Stable over wide range of pH					
Funginex®		6,5	Neutralized in slightly alkaline water					
Furadan®	X	6,0	78 hrs.			8 days		
Fusilade®		7,0	17 days		21 wks.			65 wks.
Gallery®		7,0	Stable over wide range of pH					
Gem®		7,0	27 hours		Stable from pH 4 to 8			
Glean®		7,0	Do NOT lower pH of water					
Genesis®		7,0	Stable over wide range of pH					
Goal®		7,0			Stable in neutral pH			
Gramoxone® Extra		6,5	Not stable in pH > 7.0					
Gramoxone® MAX		6,5	Not stable in pH > 7.0					
Guthion® *updated 4-08*		6,5	12 hours		10 days		17 days	>30 days
Harmony®		7,0	Do NOT lower pH of water					
Harmony® Extra		7,0	Do NOT lower pH of water					
Harmony® GT		7,0	Do NOT lower pH of water					
Headline®		7,0	30 days					
Imidan® *Updated 12-03*	X	5,0		33 min.	1 hrs.	36 hrs.	7 days	13 days

Intrepid®		7,0	Stable in pH from 6.0 to 11.0						12 hrs.		
Kelthane®	X	5,5	1 hr.			5 days			20days		
Kerb®		6,5				Stable in pH 5.5 - 7.5					
Lannate®		6,5					Stable in slightly acidic water				
Laredo®		7,0	Unaffected by Alkaline Hydrolysis								
Larvin®	X	5,0				Stable in pH 4.0 - 7.5					
Lasso®	X	5,5	Affected by alkaline water								
Lexone®		7,0	Unaffected by Alkaline Hydrolysis								
Lindane		7,0	11 days			27 wks.					
Lorsban®		7,0		1.5 days		35 days			63 days		
Malathion	X	5,0	5 hrs.	19 hrs.		3 days		8 days			
Maneb® *Updated 5-03*	X	5,5	4 hrs.			17 hrs.			20 days		
Manzate®	X	5,5	4 hrs.			17 hrs.			20 days		
Matrix FNV		5.0 to 7.0		Do not put into solution below 4.0 or above 8.0 pH							
Maverick® *Updated 1-04*		7,0	11 days					30 days			
Mitac®	X	5,0	1.5 hrs.			15 hrs.			35 hrs.		
MetaSystex R ®	X	6,0	Unstable in alkalies					12 hrs.			
Mocap®		7,0	Stable over wide range of pH								
Monitor®	X	5,5	Decomposes rapidly at pH >7						>30 days		
Movento® Added 11-09		7,0	Stable over wide range of pH								
Morestan®	X	4,5	4 hrs.			80 hrs					10 days
Nemacur®		7,0	8 days			700 days					40 days
Oberon® *Added 4-06*		7,0		Optimum pH is 6.0-8.0					Do Not Acidify Below 6.0		
Oftanol®		7,0	90 days			525 days					325 days
Omite® 30W & CR		7,0	5 days								
Orthene® *updated 3-08*		7,0	3 days			17 days			55 days		
Parathion		7,0		25 hrs.		120 days					
Peak®		7,0	672 days			423 days			10 days		
Permit®/Sandea®		7,0	Stable over wide range of pH								
Pencozeb®	X	5,5	4 hrs.			17 hrs.			20 days		
Pendimethalin		7,0	Stable over wide range of pH								
Pinnacle®		6,0	Rapid hydrolysis at pH 9								
Platinum® *Added 8-04*		7,0	Susceptible to alkaline hydrolysis in pH >9.0								
Poast®		7,0	Stable in pH 4.0 - 10.0								
Pounce®		6,0				pH 5.7 - 7.7 is optimum					
Pristine® *7-04*		6,8	Stable in pH 6.7 - 7.5								
Princep®		6,0	24 days						96 days		120 days
Previcur®		7,0	Stable over wide range of pH								
Promalin®		6,0	Unstable in pH >8								
Provado®		7,0	Stable over wide range of pH								
Prowl®		7,0	Stable over wide range of pH								
Proaxis® *Added 8-04*			Awaiting Manufacturer Information								
Pyramite®		7,0	Stable over wide range of pH								
Pyrethrum *Added 6-04*		6,0				pH 6.5 - 7.5 is optimum					
Rave®		7,0	Stable from 7.0 to 9.0						31 days		
Reglone®		6,0				Stable in neutral or acid solutions					
Ridomil Gold® MZ	X	5,0	Most stable at 5.0 Less stable at 7.0 to 9.0								
Rimon® *Added 8-27*			Awaiting Manufacturer Information								
Ronilan® *7-04*		6,8	Stable in pH 6.7 - 7.5								
Roundup®	X	5,5						pH 5.0 - 6.0 optimum			
Rovral® *updated 3-08*	X	6,0	Rapid above 8.0			pH 5.0 - 7.0 optimum					37 days
Rubigan®		7,0	Stable over wide range of pH								
Rynaxpyr™ *revised 9-07*		7,0	Stable for at least 72 hours pH 4.0 to 9.0								
Savey®		7,0	Stable over wide range of pH								
Scala®		7,0	Stable over wide range of pH								
Sencor®		6,5	Stable in pH 5.0 - 9.0								
Sevin®		7,0	1 day	2.5 days		24 days		100 days			
Sevin XLR®		7,0	1 day	2.5 days		24 days		100 days			
Shadeout®		7,0				Stable in neutral pH					
Sovran® *added 6-08*		7,0	7 hrs.			34 days			Stable		
Spinosad® *added 11-09*		7,0	Stable in pH from 5.0 to 9.0						12 hrs.		
Spintor®/Success®		7,0	Stable in pH from 5.0 to 9.0						12 hrs.		
Stratego®			27 hours	Stable in pH 5.0 - 8.0							
Surflan®		7,0	Stable over wide range of pH								
Tanos™ *Added 12-03*	X	6,5	Rapid hydrolysis at pH >7								
Terrachlor®	X	5,5	Rapid hydrolysis at pH >7								
Thiodan®		6,0	Some alkaline hydrolysis								
Tilt®		7,0	Stable over wide range of pH								
Topsin® M *Update 8-06*		7,0	Stable in pH 6.7 - 7.5								
Treflan®/Trifuralin		7,0	Stable over wide range of pH								
Trimec®		7,0							Avoid pH 5.0 or less		
Triumph®	X	5,5	20 hrs					8.3 days	Avoid pH 5.0 or less		
Turcam®		6,0	45 mins.			3 days			48 days		
Warrior® *Updated 8-04*		6,5				Stable in pH 5.5 - 7.0					
Vendex®		7,0	Not effected by pH								
Vydate®	X	5,0	30 hrs.						Stable at 4.7 pH		
Zeal®		7,0	Stable over wide range of pH								

**® indicates that the product name listed is the registered trademark of the manufacturer.
**For most pesticides, the optimum pH is in the range of 5.0 - 6.5 (slightly acidic).
**An 'X' in the buffering column denotes that the use of a buffering agent such as TRI-FOL(r) should produce significant agronomic gains.
**Check with the respective manufacturer's label for recommended pH levels. Many factors determine the efficacy of sprays, therefore, it is not possible to guarantee any combination or results accordingly. The following factors are involved with chemical performance: pH, temperature, solubility, concentrations, type of agitation, humidity, mixture time in tank and time of application. The above pH half-life information has been obtained from various manufacturers, universities, and state agricultural sources. Wilbur-Ellis has not tested the above stability levels nor verified the pH half-life ranges, but rather offers the above information as a guideline to address the issue of pH importance to more effective spray application.
Data Sources; University of Massachusetts, Ohio State University, North Carolina Ag extension, and product labeling.