CONTENTS

English Summary

I. Introduction	1
1. Effect of surfactants on physico-chemical properties of	spray
solution and pesticidal efficiency of pesticides	3
2. Influence of sticking and thickening agents in controlli	ng the
spray drift	12
3. Role of oils in increasing the foliar deposition and bio-	esidual
activity of insecticides	17
4. The role of acidifying agents in increasing retention an	d
efficiency of insecticides	25
Aim of the work	29
II. Experimental	
Techniques	30
1.Materials	30
1.1.Insecticides	30
1.1.1.Organophosphorusinsecticides	30
1.1.2.Syntheticpyrethroidinsecticides	32
1.2.Adjuvants	34
2.Methods	36
2.1. Determination of the physico-chemical properties of	local
additives and their mixtures with candidate insecticides	36
2.1.1. Physica-chemical properties of local additives	36

2.1.2. Physical compatibility of different local additives and
candidate insecticide under field dilution rate37
2.1.3. Effect of adjuvants on the physico-chemical properties of
spray solution of some insecticide40
2.2. Insecticidal efficiency41
2.3. Persistence of insecticides alone and insecticide-additive
mixture on cotton plants42
III. Results And Discussion
1. Determination of physico-chemical properties of chemical
additives45
1.1. Solubility
1.2. Free alkalinity and acidity46
1.3. Hydrophilic-Lipophilic Balance (HLB)46
1.4. Critical Micelle concentration (CMC)46
1.5. Physico-chemical properties of some certain additives in
water49
2. Physical compatibility between candidate insecticides and
chemical additives51
2.1. tank-mix technique51
2.2. Direct-mix technique57
3. Effect of certain chemical additives as adjuvant on physico-
chemical properties of spray solution of candidate insecticides $\dots 63$

3.1. tank-mix	63
3.2. Direct-mix	70
4. Efficacy of tested insecticides alone and its mixtures with the	
locally chemical additives on the Cotton leafworm larvae	72
4.1. Toxicity of tested insecticides alone and its direct mix with	
different chemical additives on cotton leafworm	72
4.1.1. Dursban Treatment	72
4.1.2. Curacron Treatment	73
4.1.3. Axone Treatment	73
4.1.4. Super alpha Treatment	74
4.2. Toxicity of tested insecticides alone and its tank mix with	
different chemical additives on cotton leafworm	79
4.2.1. Dursban Treatment	79
4.2.2. Curacron Treatment	79
4.2.3. Axone Treatment	80
4.2.4. Super alpha Treatment	80
5. Persistence of Dursban and Axone on cotton leaves	86
Reference	96
Arabic Summary	

List of Tables

Table	page
Table (1): The solubility of chemical additives in water and pesticides	47
Table (2): The free alkalinity and the free acidity of the locally chemical additives	48
Table (3): The CMC values correlated with surface tension of the locally chemical additives and HLB	49
Table (4): Physico-chemical properties of some certain additives at concentration in water	50
Table (5): Emulsion stability test for Dursban at field dilution rate and tank mixed with additives	53
Table (6): Emulsion stability test for Curacron at field dilution rate and tank mixed with additives	54
Table (7): Emulsion stability test for Axone at field dilution rate and tank mixed with additives	55
Table (8): Emulsion stability test for Super alpha at field dilution rate and tank mixed with additives	56
Table (9): Physico-chemical properties of Dursban alone and its direct mix with additives	59
Table (10): Physico-chemical properties of Curacron alone and its direct mix with additives	60
Table (11): Physico-chemical properties of Axone alone and its direct mix with additives	61
Table (12): Physico-chemical properties of Super alpha alone and its direct mix with additives	62
Table (13): Physico-chemical properties of spray solution of Dursban alone and its tank mix with additives	66
Table (14): Physico-chemical properties of spray solution of Curacron alone and its tank mix with additives	67
Table (15): Physico-chemical properties of spray solution of Axone alone and its tank mix with additives	68
Table (16): Physico-chemical properties of spray solution of Super alpha alone and its tank mix with additives	69
Table (17): Physico-chemical properties of direct mixed insecticide-additives of spray solution	71
Table (18): Toxicity of Dursban 44.5%EC alone and its direct mixed with physically chemical additives on cotton leafworm	75

Table	
Table	
Table (19): Toxicity of Curacron 72%EC alone and its direct	76
mixed with physically chemical additives on cotton leafworm.	7.0
Table (20): Toxicity of Axone 5%EC alone and its direct	77
mixed with physically chemical additives on cotton leafworm.	, ,
Table (21): Toxicity of Super alpha 10% EC alone and its direct	78
mixed with physically chemical additives on Cotton leafworm.	, 0
Table (22): Toxicity of Dursban 44.5%EC alone and its tank	
mixed with chemical additives against 4th instars larvae of	82
cotton leafworm.	
Table (23): Toxicity of Curacron 72.5% EC alone and its tank	0.0
mixed with chemical additives against 4th instars larvae of	83
cotton leafworm.	
Table (24): Toxicity of Axone 5%EC alone and its tank mixed	
with chemical additives against 4th instars larvae of cotton	84
leafworm.	
Table (25): Toxicity of Super alpha 10%EC alone and its tank	
mixed with chemical additives against 4th instars larvae of	85
cotton leafworm.	
Table (26): Dursban and Axone residues in leaves of cotton	87
Table (27): GC-FPD and ECD conditions for determination of	4.4
Chlorpyrifos and Lambda-cyhalothrin residues.	44

List of Figures

Figure	Page
Fig (A): Standard GC Chromatogaram of Chlorpyriphos	89
Fig (1): GC Chromatogaram of 100% Chlorpyriphos (Complete dose)	89
Fig (2): GC Chromatogaram of 75% from recommended rate of Chlorpyriphos	90
Fig (3): GC Chromatogaram of 75% from recommended rate of Chlorpyriphos plus DL600.	90
Fig (4): GC Chromatogaram of 100% Chlorpyriphos (Complete dose)	91
Fig (5): GC Chromatogaram of 75% from recommended rate of Chlorpyriphos	91
Fig (6): GC Chromatogaram of 75% from recommended rate of Chlorpyriphos plus DL600.	92
Fig (B): Standard GC Chromatogaram of lambda cyhalothrin	92
Fig (7): GC Chromatogaram of 100% lambda cyhalothrin (complete dose)	93
Fig (8): GC Chromatogaram of 75% recommended rate from lambda cyhalothrin	93
Fig (9): GC Chromatogaram of 75% recommended rate from lambda cyhalothrin plus CAPL1	94
Fig (10): GC Chromatogaram of 100% lambda cyhalothrin (complete dose)	94
Fig (11): GC Chromatogaram of 75% recommended rate from lambda cyhalothrin	95
Fig (12): GC Chromatogaram of 75% recommended rate from lambda cyhalothrin plus CAPL1	95