

**THE SAN JOSÉ SCALE  
(ASPIDIOTUS PERNICIOSUS,  
COMST.) AND METHODS  
OF TREATMENT**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649518197

The San José Scale (*Aspidiotus Perniciosus*, Comst.) and Methods of Treatment by A. E. Stene

Except for use in any review, the reproduction or utilisation of this work in whole or in part in any form by any electronic, mechanical or other means, now known or hereafter invented, including xerography, photocopying and recording, or in any information storage or retrieval system, is forbidden without the permission of the publisher, Trieste Publishing Pty Ltd, PO Box 1576 Collingwood, Victoria 3066 Australia.

All rights reserved.

Edited by Trieste Publishing Pty Ltd.  
Cover @ 2017

This book is sold subject to the condition that it shall not, by way of trade or otherwise, be lent, re-sold, hired out, or otherwise circulated without the publisher's prior consent in any form or binding or cover other than that in which it is published and without a similar condition including this condition being imposed on the subsequent purchaser.

[www.triestepublishing.com](http://www.triestepublishing.com)

**A. E. STENE**

**THE SAN JOSÉ SCALE  
(ASPIDIOTUS PERNICIOSUS,  
COMST.) AND METHODS  
OF TREATMENT**



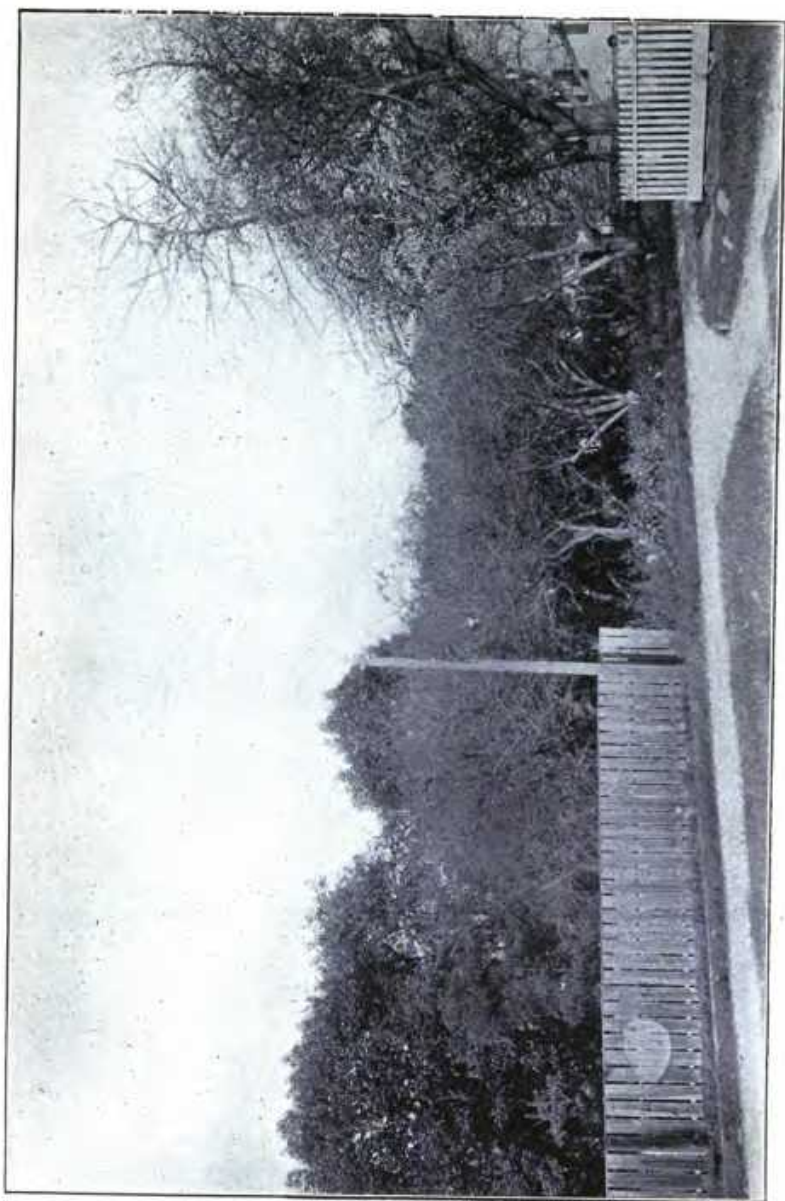


PLATE I.—Part of large orchard destroyed by scales, East Providence. Photograph taken in July, 1907.  
This picture illustrates the condition of hundreds of orchards in the state.

Rhode Island Board of Agriculture

State of Rhode Island and Providence Plantations.

# THE SAN JOSÉ SCALE

(*Aspidiotus perniciosus*, Comst.)

AND

## METHODS OF TREATMENT.

A. E. STENE.



FIG. 1.—Female San José Scale. After Atwood. See page 24.

Joint Bulletin of the State Board of Agriculture and Extension  
Department of the Rhode Island College of Agriculture  
and Mechanic Arts.

1908.

Did.  
V. G.  
H. J.

## PREFACE.

This bulletin is written in response to a very urgent demand for information on the San José scale, as evinced by the hundreds of letters which come into the office of the Extension Department of the College every year with questions regarding this insidious fruit pest and methods of destroying it or preventing its ravages.

The bulletin is divided into two parts. The first part, in large type, is in the nature of a summary, and presents briefly the essentials in formulas and directions for treatment of the scale for quick perusal and for those who do not care for a further study of the subject. With each of the statements in the summary, page references are given to the second part of the bulletin.

The second part of the bulletin takes up a fuller discussion with an endeavor to present a history and description of the scale and methods of dealing with it in the light of present knowledge and practice such as the up-to-date Twentieth Century farmer is demanding.

The bulletin contains but little original material, except such general observations as have been made on the behavior of the scale under local conditions and the tabulation of losses as shown by information obtained through the circular sent out the past autumn to the names on the mailing list of the Rhode Island Experiment Station.

An endeavor has been made to present the gist of information which seems, in the opinion of the writer, essential to a fairly complete knowledge of the scale and methods of treatment, but undoubtedly much has been left out, and if anyone wishes to pursue the subject further, he can refer to the following books and publications, from which the writer's information is largely drawn:

02-1-354.81

Economic Entomology, by Dr. John B. Smith, published by Lipincott.

Fumigation Methods, by Willis G. Johnson, published by Orange Judd Co.

Spraying of Plants, by Lodeman, published by the Macmillan Co.

Bulletins of the N. Y. State Museum at Albany, by E. P. Felt.

Bulletins by Dr. Howard and Dr. Marlatt and others of the Department of Agriculture at Washington.

Bulletins of various experiment stations in the United States, but principally those of New York, Delaware, Massachusetts, Connecticut, California, and Washington; also articles from the Rural New Yorker, Country Gentleman, and the New England Homestead.

#### ACKNOWLEDGMENT.

The writer is greatly indebted to the Bureau of Entomology, Department of Agriculture, at Washington, for co-operation in securing estimates of damage done by the scale; to the Rhode Island Experiment Station for the use of mailing machine in sending out circular letters; to the Federal Department of Agriculture and various experiment stations, and manufacturers of spray apparatus, for use of cuts, full credit of which is given elsewhere; and to the following persons for submitting estimates of value of fruit trees: L. G. K. Garner, Arnold's Mills, R. I.; Cyrus Miller, Haydenville, Mass.; Prof. Craig, Cornell University; Prof. U. P. Hedrick, New York Experiment Station, Geneva; Prof. William Stuart, Vermont Experiment Station; and Geo. T. Powell, Ghent, N. Y.



## CONTENTS.

Preface.....	3
Contents.....	5
Summary.....	9
Introduction.....	14
Popular Fallacies Regarding Insects and Their Control.....	16
General History of the San Jose Scale.....	20
History in Rhode Island.....	21
Methods of Detecting the Scale.....	22
Life History.....	23
Description of the San Jose Scale.....	25
Host Plants.....	27
Natural Enemies of the San Jose Scale.....	32
Means of Distribution of the Scale.....	34
Losses Due to the Scale in Rhode Island.....	35
Status of Fruit-growing as Affected by the Scale.....	38
Future Prospects.....	40
Chances of Saving Trees Badly Infested.....	41
Does it Pay to Spray.....	41
Present Means of Controlling the San Jose Scale.....	42
General Orchard Treatment.....	42
Spraying.....	44
Brief General History of Spraying for the Scale.....	44
The Lime-Sulfur Wash.....	46
Formula for Lime-sulfur Wash Generally Recommended at the Present Time.....	48
Ingredients of the Lime-sulfur Wash.....	49
Apparatus for Preparing the Lime-sulfur Wash.....	51
Chemical Composition.....	52
Other Lime-sulfur Remedies.....	55
Remedies from Petroleum.....	56
Kerosene Limoid Mixture.....	57
Miscible Oils.....	58
Proprietary Remedies from Petroleum.....	60

Comparative Value of the Lime-sulfur and Miscible Oils.....	60
Miscellaneous Spray Solutions for the San Jose Scale.....	61
Whale Oil Soap.....	61
Resin Wash.....	62
A New Wash Proposed by the U. S. Dept. of Agriculture....	62
Comparative Cost of Spray Solutions.....	63
The Time of the Year to Spray.....	64
Methods of Applying Spray Remedies.....	64
Spraying Apparatus.....	65
Fumigation with Hydrocyanic-acid Gas.....	74
Orchard Fumigation.....	76
Fumigation of Nursery Stock.....	77
Apparatus, Chemicals, and Methods of Fumigating Nursery Stock.....	78
The Fumigation House.....	80
Fumigation of Peach and Nectarine Houses for the San Jose Scale.	83
Directions for Fumigating Peach and Nectarine Houses..	84
The Operation.....	86
Dipping Nursery Stock.....	87
Additional Notes and Explanations Regarding Illustrations—	
Acknowledgment for use of Cuts.....	89
Notes.....	89

## LIST OF CUTS.

Figures.	Page of Cut.	Reference Page.
1. Female San Jose Scale.....	1	24
2. San Jose Scale on Twig.....	9	23
3. Male San Jose Scale Insect.....	20	26
4. Magnifying Glass.....	22	23
5. Underside of Female showing Sucking Tube.....	24	26
6. Development of the Scale.....	25	23
7. Scale of Male San Jose.....	25	26
8. Cut showing Characteristic form of Anal Plate of Female, as seen under the Microscope.....	26	..
9. <i>Microweisia misella</i> Preying on San Jose Scale.....	32	33
10. Strainer for Straining Spray Solutions into Tank.....	51	..
11. Compressed Air Knapsack Sprayer.....	66	66
12. Large Tank with Agitator, for Large Hand or Gasoline Pump.....	67	..
13. Type of Double Acting Tank Pump.....	67	67
14. Bamboo Extension Pipe.....	68	72
15. Short Extension Pipe for Use with Bucket or Knapsack Spray- ers.....	68	72
16. "Y" for Attaching Two Nozzles to One Lead of Hose.....	68	73
17. "Mistry" Vermorel Nozzle.....	68	72
18. "Mistry Junior" Nozzle.....	68	..
19. "Demorel" Nozzle.....	68	73
20. Boiling Lime-sulfur with Steam.....	69	51
21. Boiling Lime-sulfur with Kettles.....	70	51
22. Home-made Strainers.....	71	..
23. A Recent Form of Vermorel Nozzle.....	72	73
24. A Type of Vermorel Nozzle without Plunger.....	72	..
25. Battery of "Spramotor" Vermorel Nozzles.....	73	73
26. } Cuts illustrating Method of Ascertaining Contents of	85	..
27. } Fumigation Houses.....	85	..
28. }	86	..
29. Dipping Nursery Stock, Roots and Body.....	87	88
30. Dipping Nursery Stock, Body only.....	87	88