

help increase crop yields with

Sunspray

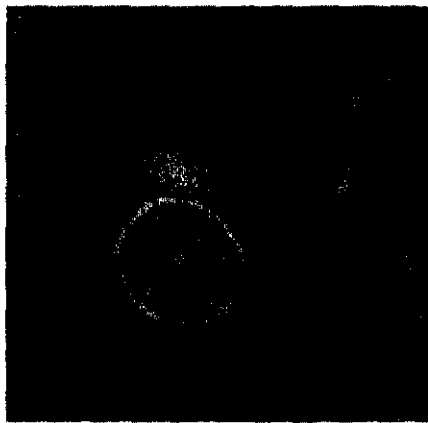
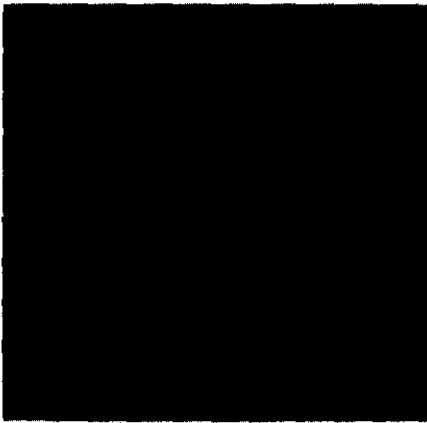
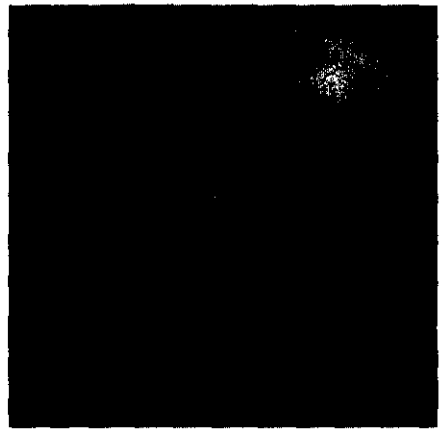
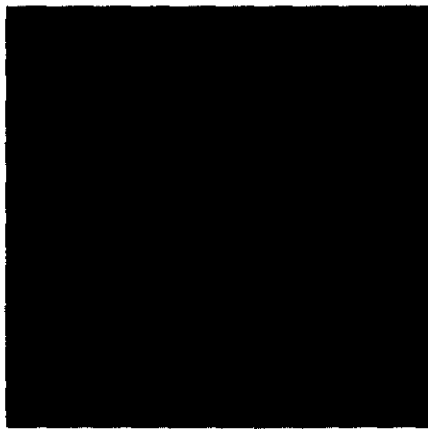
selective pest control

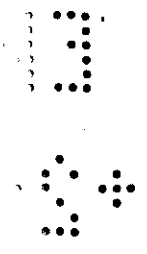
You can help get increased productivity when you add Sunspray Oils to your arsenal of weapons against fruit insects. Oil susceptible pests have never been able to build any resistance to its lethal effect. The result is improved pesticidal power that conforms with current environmental programs.

ACCEPTED

APR 09 1975

Under the Federal Insecticide, Fungicide, and Rodenticide Act, as amended, for the pesticide registered under EPA Reg. No. *862-8*





what they are

Sunspray is

the trade mark of Sun Oil Company's product line of horticultural spray oils made especially for use with other agrichemical pesticides. They are highly refined paraffinic hydrocarbons and are supplied to formulators either as base oils or completely miscible products. The SUNSPRAY line represents the latest generation of horticultural quality oils that Sun has been researching, manufacturing and field-testing for more than 50 years.

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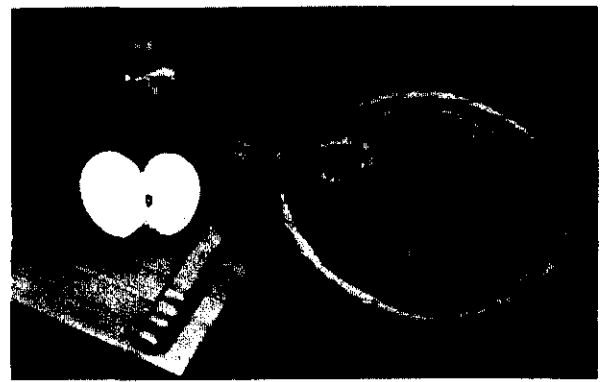
Available Sunspray Products

Product	SUS Vis. @ 100 °F	EPA Reg. No.	Wt. % Oil
1. Sunspray 11N	120 max.	862-4	100
2. Sunspray 7N	74 max.	862-6	100
3. Sunspray 6N	63 max.	862-10	100
4. Sunspray 11E	120 max.	862-9	98.8
5. Sunspray 7E	74 max.	862-8	98.8
6. Sunspray 6E	63 max.	862-11	98.8

The "N" Series of base oils are for formulators who prefer to produce their own miscible oil.

The "E" series are offered as a customer service to formulator-distributors of agrichemical pesticides who prefer to purchase a ready made miscible oil.

When you apply Sunspray as a part of your spray program you can get beneficial results like this



Cortland apples

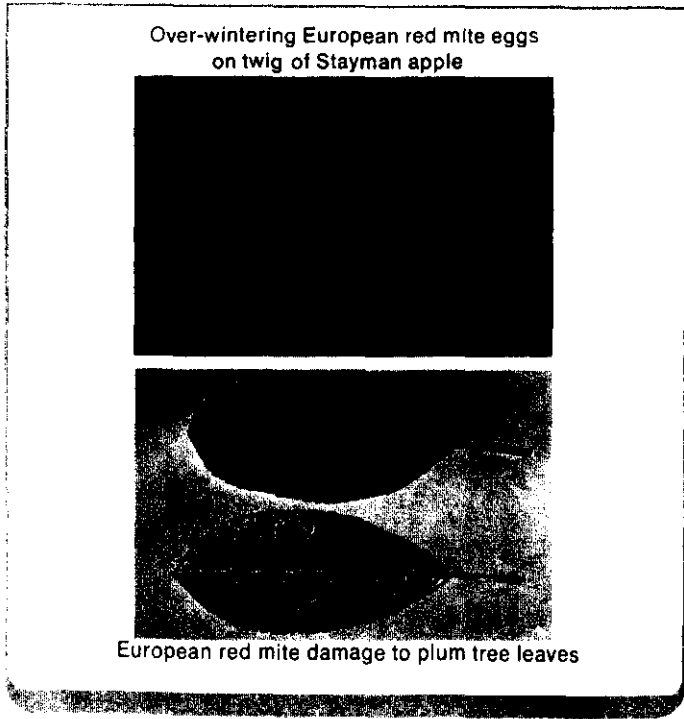
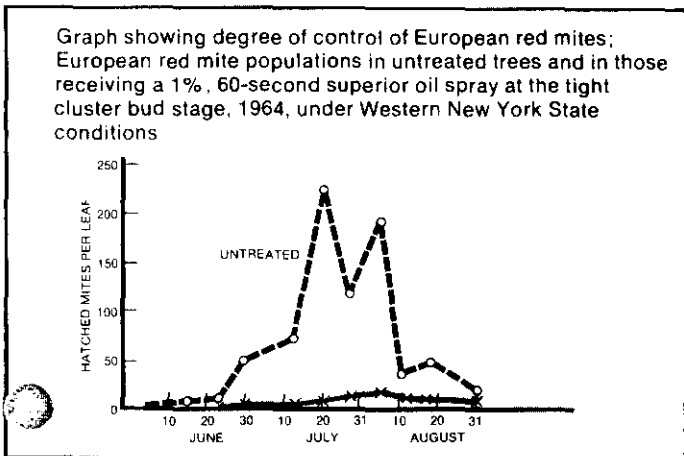
—healthy, high-yield crops generally unmarred by insect damage.

Photo credits:
Prof. Dean Asquith, Entomologist, Pennsylvania State University
Dr. P. J. Chapman, Entomologist Emeritus, Cornell University
Dr. R. R. Kriner, Entomologist, Rutgers University
Dr. A. S. Deal, Entomologist, University of California
Mr. Harvey Sutton, Waverly Growers Cooperative, Florida
Florida Extension Service, University of Florida

Sun's interest in agricultural chemicals originated in the Twenties when American fruit production was threatened by the European Red Mite (*Panonychus ulmi*) and San Jose scale (*Aspidiotus perniciosus*). The spray oil that resulted from this challenge proved to be one of the most effective countermeasures ever developed for these fruit pests.

The oil component in agricultural sprays interferes fatally with insect metabolism. And, in contrast to certain synthetic organic pesticides, oil continues to be effective year after year. Certain insects evidently have no way of developing any protection against oil attack. The result is pesticidal power that conforms completely with the rigorous standards of current ecological and environmental programs.

Sunspray Emulsifier	For Formulator Use Only			For Rebranding Purposes*		
	6N No	7N No	11N No	6E Yes	7E Yes	11E Yes
EPA Reg. #862	-10	-6	-4	-11	-8	-9
State Specs: Florida	FC412-66	FC435-66	None	FC412-66	FC435-66	None
New York	60 Sup.	70 Sup.	100 Sup.	60 Sup.	70 Sup.	100 Sup.
Texas	Light 410-425	Medium 430-450	Heavy 455-470	Light 410-425	Medium 430-450	Heavy 455-470
California Narrow Range Unclassified	CNR 415	CNR 440	Unclassified	CNR 415	CNR 440	Unclassified



Use Area	6N	7N	11N	6E	7E	11E
Citrus	X	X	X**	X	X	X**
Deciduous	X	X	X	X	X	X
Agronomical	X	X	X	X	X	X
Ornamental	X	X	X***	X	X	X***
Forestry		X				
Insecticide	X	X	X	X	X	X
Fungicide Additive	X	X	X	X	X	X
Herbicide Additive	—	X	X	X	X	X
Ground Rigs	X	X	X	X	X	X
Aerial	X	X	X	X	X	X
Concentrate	X	X	X	X	X	X

*PR Form 9-1 "Application for Supplemental Registration for Distributors"
 **Texas recommendation
 ***Dormant Spraying only

how they are used

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Sunspray products

6N, 7N and 11N are not finished horticultural spray oils. They are, however, the principal or active ingredients. As such, they mix readily with many commercially available oil-soluble emulsifiers (non-ionic preferred).

Both quick-breaking emulsions, generally preferred for agricultural sprays; or stable emulsions, usually favored for ornamentals, can be formulated. It's just a matter of choosing the proper emulsifier concentration.

Sunspray 6N, 7N, and 11N provide full coverage for crop protection in all kinds of weather, leaving either a short residual or an extended residual, as desired.

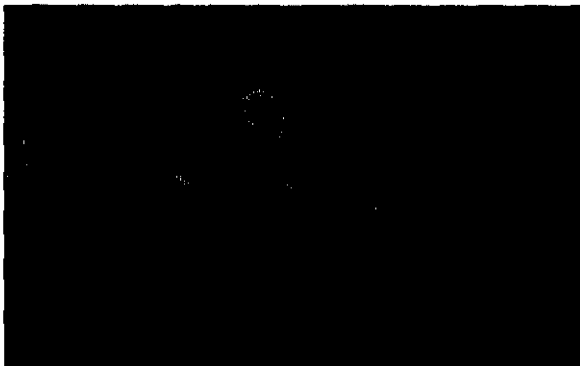
Pesticides that have been successfully combined with SUNSPRAY products include:

Insecticides:

EPN, Malathion, Cygon, Guthion, Imidan
Trithion, Ethion, Galecron and Phosalone

Fungicides:

Bordeaux, Fixed coppers, Cyprex, Difolatan, Benomyl,
TD-1771 (Cercobin-M),
Ferbam, Maneb, Polyram, Thiram and Zineb



Specific use suggestions

- 1** Sunspray Nos. 6N and 7N have narrow distillation ranges. These sprays evaporate uniformly and quickly from the surface of trees and plants, giving maximum plant safety consistent with efficient pest control.
- 2** Sunspray 7N is preferred for maximum pesticidal activity with a minimum of plant damage. Sunspray 6N is preferred if plants are approaching or breaking a stress condition. It gives adequate pesticidal control with maximum plant safety. Sunspray 11N is a quality product with a slightly broader distillation range which allows an oil application deeper in the dormant period, thereby extending the spray season to insure adequate time for an oil application.
- 3** Sunspray Nos. 6N and 7N have low viscosities which make these products four-season oils in the deciduous and citrus production area. Sunspray 11N offers a slightly higher viscosity for use in the early spring or deep dormancy to assure ample resistance to weathering.

the advantages that

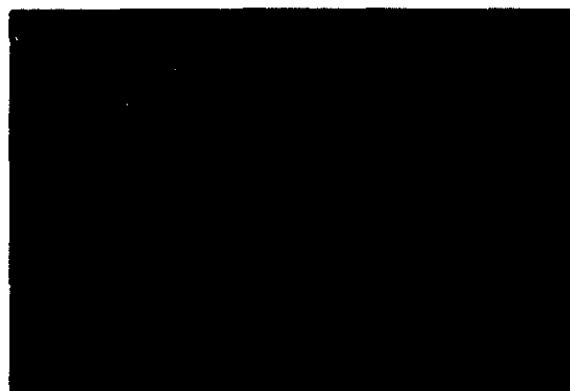
Sunspray oils

offer users

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Aphid eggs; over-wintering stage on apple twig



Rosy aphid on apple stems; *Anuraphis roseus* (Baker)



Rosy aphid damage—healthy vs. curled leaves



Rosy aphid damage—healthy vs. malformed apples

1 No build-up of resistance

Sunspray Oils help retard the rapid build-up of insect and mite resistance to chemicals — no known resistance to oil has ever been exhibited by oil-susceptible pests.

2 Integrated control

Sunspray Oils fit into and augment integrated control programs based on bio-chemical manipulation of the pests.

3 Versatility

The "E" series of miscible oils can be combined in tank mixtures with certain other insecticides, fungicides and acaricides to provide broad-spectrum control of fruit pests (see page 4).

4 Exemption from tolerance requirement

Sunspray Oils are exempted from the requirement of a tolerance when applied to growing crops in accordance with good agricultural practice, as listed in the Federal Register, Subpart D, Section 180.1001, Paragraph A and B, dated April 20, 1972.

5 Safe for plants

These highly refined products offer a high degree of safety to plants.

6 Maximum economy

Sunspray Oils provide extended periods of freedom from mite and scale stress.

7 Readily available

There are Sunspray Distribution Centers in all major use areas in the United States.

Sunspray

and state specifications

The tables on this page show how Sunspray oils meet or exceed regional oil specifications for fruit production in the deciduous and citrus belts. These specifications were developed through research at state agricultural experiment stations throughout the United States and Canada.

Sunspray 6N/State Specifications

Property	N.Y. State 60 Second Superior Oil	State of Florida FC412-66	State of Texas Light Grade	State of Calif. Narrow Range 415	Typical Data for Sunspray 6N
SUS Vis. @ 100°F. max. ¹	63	—	—	—	60
API Gravity @ 60°F. min. ²	35	33.0	34.5	—	35.0
Pour Point, °F. max. ³	+20	+20	+20	+20	+5
Unulfonated Residue, min. ⁴ ASTM	94	92	92	92	96
Distillation @ 10mmHG ⁵ , 50% point °F. 10-90% Range, °F. max.	412±8 65	412±8 80	410-425 80	415±3 60	415 60
% Carbon atoms in paraffinic structure (RI KVGC Analysis) minimum	—	—	—	60	66

The following ASTM methods are to be used: 1) D445-56 and D2161-66, 2) D287-67, 3) D97-66, 4) D483-66 and 5) D1160-61.

Sunspray 7N State Specifications

Property ⁽¹⁾	N.Y. State 70 Sec. Superior Oil*	State of Florida FC435-66	State of Texas Medium	State of Calif. Narrow Range 440	Typical Data for Sunspray 7N
SUS Vis. @ 100°F. max.	75	—	—	—	72.0
API Gravity @ 60°F. min.	33.8	31	—	34.5	34.8
Pour Point, °F. max.	+20°F.	+20°F.	+20	+20°F.	+5
Unulfonated Res., % min., ASTM	92	92	92	92	96.0
Distillation @ 10mmHg, 50% point °F. 10-90% Range, °F. max.	435±8 80	435±8 80	440±10 80	435-445 75	441 73

*Applicable for all deciduous fruit areas (1) The ASTM methods listed above

Sunspray 11N/New York and Texas

Property ⁽¹⁾	N.Y. State 100 Second Superior Oil	State of Texas Heavy Grade	Typical Data Sunspray 11N
SUS Vis. @ 100°F.	90-120	—	105
API Gravity @ 60°F. min.	31.0	—	33.3
Pour Point, °F. max.	+30	+20	-5
Unulfonated Residue, min.	90	92	92
Distillation Range @ 10mmHg 50% 10-90% Range, °F.	* *	455-470 80 max.	468 123**

*Homogeneity—a relatively narrow boiling distillate of petroleum

**Despite the wider 10-90% distillation range, Sunspray 11N is commercially and effectively used on Texas citrus as a formulated product

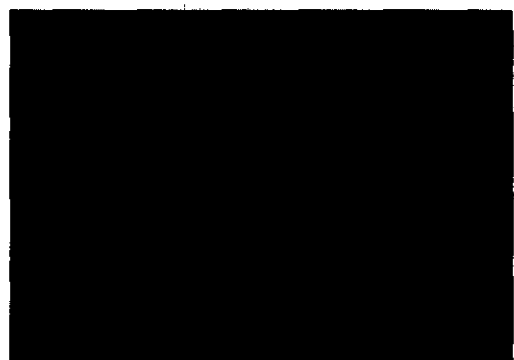
(1) The ASTM methods listed above

Sunspray

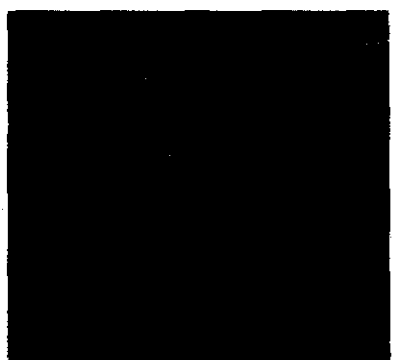
product availability

Refineries	6N			6E ¹			7N			7E ¹			11N ²			11E ¹		
	drums	TT	TC	drums	TT	TC	drums	TT	TC	drums	TT	TC	drums	TT	TC	drums	TT	TC
Marcus Hook, Pa.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Tulsa, Okla.	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Terminals																		
Tampa, Fla.	-	x	-	-	x	-	-	x	-	-	x	-	-	x	-	-	x	-
River Rouge, Mich.	-	-	-	-	-	-	x	x	x	x	x	x	x	x	x	x	x	x
Toronto, Canada							x	x	x	x	x	x	x	x	x	x	x	x
Cleveland, Ohio													x	x	x			
Dayton, Ohio													x	x	x	x	x	x
Pittsburgh, Pa.													x	x	x	-	-	-
Newark, N.J.													x	x	x	x	x	x
Providence, R.I.													x	x	x	x	x	x
Chicago, Ill.													x	x	x	x	x	x
Wilmington, Texas				-	-	-	-	x	x	-	x	x	x	x	x	x	x	x

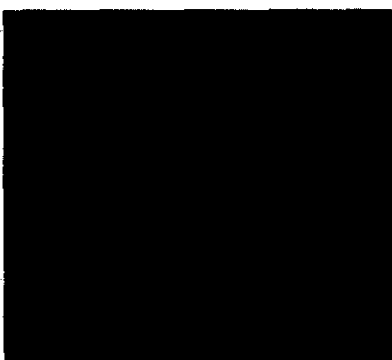
¹Florida: Sunsprays 6E, 7E and 11E can be formulated in Florida for TT tank truck (special citrus formulation) shipments
²Sunspray 11N is available at all bulk terminals



San José scale on apple;
Aspidiotus perniciosus (Comstock)



Florida red scale on citrus leaf
Chrysomaphalus aonidum (Linné)



California red scale on citrus leaf
Aonidiella auranti (Maskell)



SUN OIL COMPANY
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In Canada: Sun Oil Company Limited

You get more than oil from Sunoco

