

Memorandum

To: Tareq Formoli, Associate Pesticide
Review Scientist
Worker Health and Safety Branch

Date: November 19, 1993

Place: Sacramento

Phone: 654-1155

HSM-93005

From Department of Pesticide Regulation David Haskell, Associate Environmental
-Research Scientist [Original signed by D. Haskell]
Worker Health and Safety Branch

Subject: Use Pattern of DEF® For the Defoliation of Cotton

DEF® or Folex® are used in conjunction with other pesticides to defoliate cotton in preparation for machine harvesting. These products work by enhancing the natural abscission process that allows the leaves to fall off the plant (Munier, 1993). The active ingredient of both products, S,S,S-tributyl phosphorotrithioate, is formulated as an emulsifiable concentrate with 6 lbs of active ingredient per gallon. Application rates range from 1.3 to 2.5 pints per acre, depending on the maturity and rankness of the cotton. Due to the timely nature of defoliation and the several hundred thousand acres that need to be treated, most applications are made with aircraft.

The purpose of defoliation is to cause the mature cotton leaves to drop off the plant and to dry up any green leaves that are still growing (Munier, 1993). Defoliation facilitates the ease of machine harvesting by reducing the foliage and moisture and helps to prevent green leaves from staining the lint. The defoliation season starts in early September (southern San Joaquin Valley) and finishes in mid October (central San Joaquin Valley) depending on the weather and the maturity of the crop (Vargas, 1993; Wright, 1993). Because the active ingredient of DEF® or Folex® is an organophosphate compound, its effectiveness as a defoliant is limited by temperature. Optimal conditions for use are when daytime temperatures are above 80°F (Wright, 1993). These climatic conditions normally occur during the first 2-3 weeks of the defoliation season (Wright, 1993).

DEF® or Folex® are one of the most effective defoliants and they are often used to defoliate cotton that is still growing due to excess moisture or nitrogen from poor management practices (Vargas, 1993). Cotton that is still growing at the end of the season may require two treatments to achieve adequate defoliation. The first treatment may consist of S,S,S-tributyl phosphorotrithioate used in conjunction with a growth regulator to stop growth and cause the bolls to open earlier. A second application with sodium chlorate and a contact herbicide or growth regulator will follow after several days to complete the defoliation process. Because of the strong odor of S,S,S-tributyl phosphorotrithioate, applications to fields located near residential areas are restricted by regulation. As a consequence, use of



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these two defoliant is usually limited to the sparsely populated areas on the west side of the San Joaquin Valley (Wright, 1993). During the 1988 defoliation season, one aerial application company operating two planes treated an average of 1,000 acres of cotton per day with defoliant and growth regulators (Haskell, 1993). This applicator treated 4,078 acres with DEF® or Folex®.

REFERENCES

Haskell, D. 1993. Pesticide applicators survey to characterize work activities and to determine annual exposure to specific pesticides. Cal\EPA, Worker Health and Safety Branch, HS Report-1675.

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Vargas, R. 1993. U. C. Cooperative Cotton Specialist for Madera County. Personal conversation on November 17, 1993.

Wright, S. Farm advisor, Tulare County. Personal conversation on November 17, 1993.