

The Rhap-Trol Spray System — A New Technique For Applying* Invert Emulsion

By

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We all recognize the contributions which pesticides have made to agriculture and to related fields such as yours. At the same time, we are cognizant of the problems which have been created by the application of these pesticides. One of these problems is drift. This has caused considerable concern and is especially serious when the phenoxy herbicides which are quite active in low concentrations are being applied. The problem is intensified when applications are made by air where drift is dependent upon wind velocity and the number of fine droplets in the spray. Thus drift can be reduced if larger droplets which will not evaporate are produced and one way to accomplish this is with invert emulsions.

The use of invert emulsions in the herbicidal field was first reported in 1931; however, application techniques presented problems and it was necessary to overcome these before they could be applied commercially. Recently, new

developments in equipment have been made so that these materials can be applied.

Hercules is now developing the Rhap-Trol spray system for applying invert emulsions of herbicides and other agricultural chemicals with a minimum of drift. This system provides continuous mixing and emulsion formation in small chambers of bi-fluid mixing nozzles. This is carried out by bringing the chemical and water through separate lines to the mixing chambers where a thick water-in-oil emulsion is formed and sprayed simultaneously.

The relatively large drops produced by the bi-fluid nozzle, as our slides will indicate, can be deposited with surprising accuracy on the target desired.

FEATURES OF THE RHAP-TROL SYSTEM

1. Produces uniform droplet size—large enough to prevent drift; small enough to insure adequate coverage.
2. Eliminates premixing—mixing equipment, mixing errors and left-over spray mix.
3. A boom lays down a uniform swath.
4. Oil droplet provides better contact, absorption, less washing away by rain.
5. Applies very thick as well as thin emulsions.
6. Can be adapted to every method of application, back pack to airplane.

The following slides show the features of this system—how it operates and results obtained.

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Florida Department of Agriculture's Position On Parasites and Predators Introduced Into Florida For Biological Control¹

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The introduction of parasites and predators into Florida dates back to 1899 when the vedalia, *Rodolia cardinalis* (Mulsant) was introduced. This lady beetle was introduced into California from Australia in 1889 and into Florida in 1899 to control cottony-cushion scale, *Icerya purchasi* Maskell, that was introduced in 1893. This predator was very successful in controlling this pest but never eradicated it. For many years the vedalia was reared by the State Plant Board and sold for \$1 for a colony of ten beetles. Cottony-cushion scale is still present today but is not considered an important pest. A hymenopterous parasite, *Cryptochaetum monophlebi*, was introduced from California in 1917 to aid in controlling cottony-cushion scale. It is not known whether this parasite became established.

A whitefly-eating lady beetle, *Delphastus catalinae* (Horn) was introduced from California in 1917 to control the citrus whitefly, *Dialeurodes citri* (Ashmead). This lady beetle became established in the Bradenton area in the early 1900's, but there are no records of its being in Florida today. The Chinese lady beetle, *Leis dimidiata quinque-decimmaculata* (Hope), was introduced into several citrus areas in Florida from California in 1925 to control the spirea aphid. This aphid, often referred to as the green citrus aphid, was considered a severe pest of citrus during the 20's. Dr. A. N. Tissot was hired by the Florida Agricultural Experiment Station to work with this pest. The Chinese lady beetle can still be found in Orange County, but it is not very effective in controlling the spirea aphid. A lady beetle, *Cryptolaemus montrouzieri* Mulsant, (originally from Australia) was introduced into the citrus belt in 1930 from California to control the citrus mealybug. It became established, and Dr. Martin H. Muma reported in 1955 that it was wide-spread in the citrus belt. The convergent lady beetle, *Hypodamius convergens* Guerin-Meneville, has been introduced from California many times to control aphids on truck crops. This lady beetle is endemic to Florida. Its habit of hibernating in large numbers in California, making it easily accessible, has encouraged entomologists to collect and sell this lady beetle.

These are the seven recorded introductions into Florida until 1947.

The following is a list of nineteen parasites and predators released through the U. S. Department of Agriculture, Agricultural Research Service, Entomology Research Division, since 1947:

¹ Contribution No. 40, Entomology Section