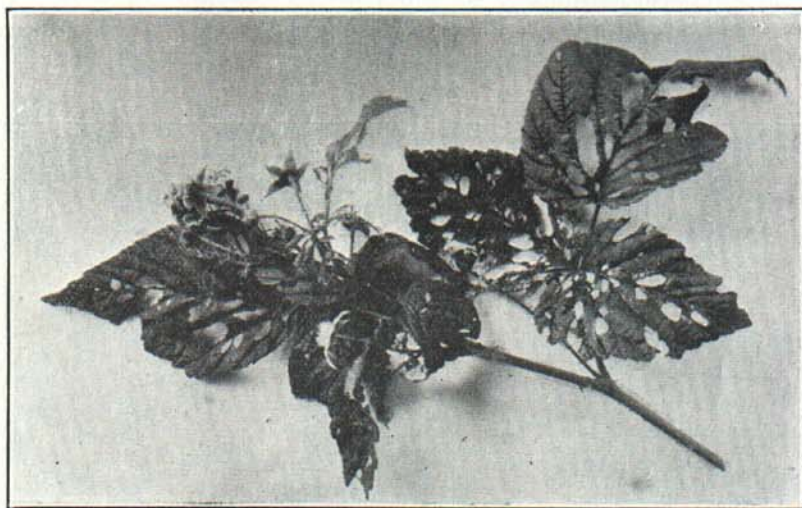


DERRIS AND PYRETHRUM FOR INSECT CONTROL

RAY HUTSON



Raspberry Foliage Damaged by Sawflies.

MICHIGAN STATE COLLEGE
Of Agriculture and Applied Science

EXTENSION DIVISION

R. J. Baldwin, Director

Printed and distributed in furtherance of the purposes of the cooperative agricultural extension work provided for in the Act of Congress May 8, 1914, Michigan State College of Agriculture and Applied Science and U. S. Department of Agriculture, cooperating.

DERRIS AND PYRETHRUM FOR INSECT CONTROL

RAY HUTSON

Cabbage, cauliflower, currant, snap bean, and berry producers have fought the insects infesting their crops with arsenicals for a long time. Governmental regulations regarding fruit and vegetables treated with lead arsenic and fluorine are forcing a change in this practice because it is difficult and expensive to remove such residues from vegetables.



Fig. 1. Cabbage plant riddled by cabbage worm.

Extended tests by Michigan State College and other interested agencies in this and other states have resulted in the development of derris and pyrethrum insecticides that kill many insects without leaving a residue. Mexican bean beetle, cabbage worms, currant worms, and many other insects occurring upon plants from which residues are difficult to remove are readily controlled by derris* or pyrethrum sprays or dusts. In addition to avoiding residue, derris and pyrethrum insecticides

*The term Derris is used for convenience. Present information indicates that "Cube" of equivalent rotenone content is just as satisfactory.

ticides are more effective than the commonly used arsenicals against some insects, notably cabbage worms.

Both of these materials are of plant origin and, in common with insecticides derived from such sources, have certain peculiarities in their reactions which necessitate that they be used in certain definite ways. Derris and pyrethrum work best when finely ground if used as dusts; and when the proper spreader is present, if used as a spray. Then, too, the kind of mixing material used in a dust makes a difference. Tobacco dust, talc, bentonite, clay, chalk, sulphur, and flour are good dust mixing materials; soap, emulsified oils, and sulphated alcohols are good spreaders for sprays.

Derris and pyrethrum are sometimes combined in an insecticide, but this practice is not so commonly followed since improved methods for preparing these materials have been devised.



Fig. 2. Typical work of larvae and adults of Mexican bean beetle.

Present information indicates that when good power equipment is available, spraying is the proper method of applying derris and pyrethrum insecticides to truck and garden crops. On small scale operations where power equipment is not available hand dusting has given better results than hand spraying. Hand dusters capable of protecting as much as 3 to 5 acres of field or garden crops are comparatively inexpensive, while the backyard or kitchen gardener can supply himself with a duster for less than a dollar.

Derris and pyrethrum lose their effectiveness very rapidly when exposed to air and sunlight in the thin layers applied on plants. Derris retains its effectiveness longer under such conditions than pyrethrum.

Many good brands of derris and pyrethrum insecticides are on the market; consult your county agricultural agent concerning those sold locally.

DERRIS

Derris insecticides are prepared from the roots of a tropical shrub. One of the toxic principles in derris is rotenone, which is mentioned because most assays of derris are based upon the rotenone present; in making dusts from ground derris it is convenient to adjust the amounts of ground derris and the mixing material to obtain a given percentage of rotenone. Ground derris is commonly sold containing 4 per cent rotenone. A good insecticidal dust contains $\frac{1}{2}$ to $\frac{3}{4}$ per cent rotenone.

A good derris dust can be made by thoroughly mixing 1 pound of ground derris root of 4 per cent rotenone content with 6 pounds talc, clay, bentonite, chalk, tobacco dust, flour, or sulphur. Such a mixture will contain a little more than $\frac{1}{2}$ of 1 per cent rotenone and can be stored for 2 or 3 months. Good dusts can be made from derris assaying more or less than 4 per cent rotenone, but the amount of mixing material will be different. Applied at the rate of 15 to 25 pounds per acre the dust will control cabbage worms, Mexican bean beetle, currant worms, slugs, and most caterpillars.

Five pounds ground derris with 1 pound powdered skim milk, 2 gallons of skim milk, 3 pounds of thoroughly dissolved soap or 3-6 oz. of one of the sulphated alcohols make 100 gallons of effective spray.

Derris is ineffective, however, against celery leaf tier and corn ear worm.

PYRETHRUM

Pyrethrum is made from the dried floral parts of a plant resembling oxeye daisy. It is grown in Dalmatia and other Mediterranean countries, but the chief source of supply is Japan. It is a constituent of many fly sprays. The active principles of pyrethrum are known as pyrethrins and constitute about 1 per cent of most commercially ground pyrethrum.

A good pyrethrum dust for control of insects such as those infesting celery usually contains 30 to 50 per cent of finely ground pyrethrum or its equivalent pyrethrins mixed with one of the inert mixing materials.

Pyrethrum sprays vary in pyrethrin content so widely that the sprays are best made from commercial extracts according to the manufacturer's recommendation.