

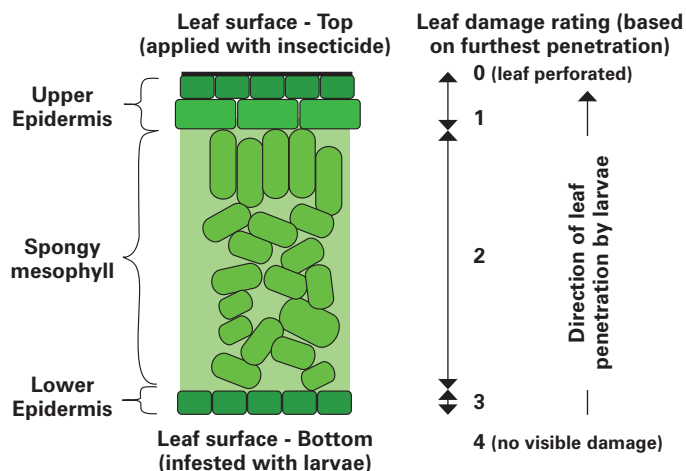
# The Translaminar Movement of DuPont™ Lannate® and Vydate® Insecticides in Leaves



Recent DuPont studies have again demonstrated the excellent translaminar movement of DuPont™ Lannate® and Vydate® insecticides in leaves. Both products protect plants from insects that not only feed on the top of the leaf, but also the bottom. The translaminar action of both products results in improved plant protection from chewing and sucking insects.

## What is translaminar movement?

Translaminar movement is the ability of the active ingredient of the insecticide to penetrate the leaf cuticle and move into the leaf tissue (see Figure 1). Products with translaminar movement can offer control of insects feeding on the “unexposed” side of the leaf, as well as from sucking insects that feed from plant juices inside the leaf.



**Figure 1 – Diagram of a cross section of a leaf.** Larvae were placed on the bottom leaf surface (confined to a clip cage) and insecticide was applied to the top leaf surface.

In a recent DuPont study where diamond back moth (*Plutella xylostella*) populations were examined, Lannate® insecticide demonstrated excellent translaminar movement on cabbage leaves. In this study, Lannate® was applied only on the upper side of the leaf at a rate of 0.45 lb ai/A in 5 to 10 gallons per acre of water. The effect of three different adjuvants was also tested. One day after application, clip cages containing five diamondback moth larvae were attached to the underside of the treated leaves, this

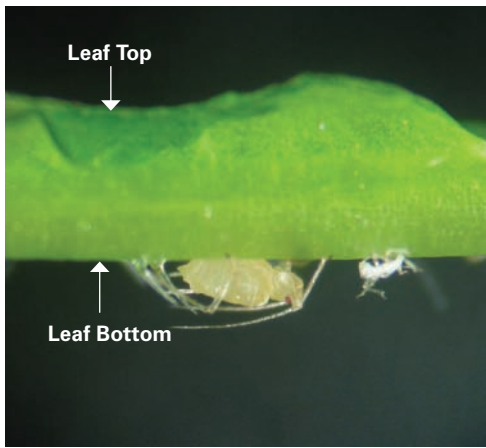
was repeated six times. At the end of 72 hours, feeding damage ratings were taken in all clip cages using the scale shown in Table 1. Leaves with ratings of 2-4 were considered to have shown translaminar activity as the larvae died before being able to eat all the way through the leaf. Ratings between 0-1 indicated no translaminar action. The results from this study were expressed in percent translaminar action and are shown below in Table 2.

Rating	Damage Level
0	Totally perforated
1	Window paned
2	Mesophyll punctured
3	Lower epidermis punctured
4	No visible damage

Volume (gal/A)	Adjuvant (% v/v)	Translaminar Control (%)
5	None	100
10	None	67
10	Organosilicone (0.025%)	33
10	Non-ionic surfactant (0.125%)	100
10	Methylated seed oil (0.5%)	83

Two conclusions can be drawn from this study. Translaminar activity improves with higher tank concentrations (lower spray volume). Second, the use of non-ionic (NIS) and methylated seed oil (MSO) adjuvants improved the translaminar movement of Lannate® into the cabbage leaf. Pure organo-silicone adjuvants decreased the translaminar activity.

Aphids are another insect species that commonly feed on the underside of leaves (see Figure 2). They feed by sucking the leaf juices out of the spongy leaf mesophyll from the underside of the leaf. Products with good translaminar activity can help control aphids. With aphid populations under control, plants are more vigorous and produce a greater and higher quality yield.



**Figure 2 – Green peach aphid feeding on the underside of a radish leaf**

A recent study conducted by DuPont scientists showed excellent control of two species of aphids, cotton/melon aphid (*Aphis gossypii*) and green peach aphid (*Myzus persicae*). As in the previous study, pepper or squash leaves were treated only on the upper surface of the leaf with Lannate® or Vydate® insecticides. Clip cages containing approximately 30 live aphids were attached to the underside of three treated leaves one day after the application. Aphid mortality ratings were taken 72 hours after infestation and converted to percent control (see Table 3).

Lannate® and Vydate® provided excellent translaminar control of cotton/melon aphid and green peach aphid in squash and pepper, respectively. The translaminar

activity of Lannate® appears more dependent on spray concentration than that of Vydate®. Again, lower spray volumes used with Lannate® improved translaminar movement, indicating that higher tank concentrations improve translaminar movement. This study did not include the effect of addition of spray adjuvants, however, it is possible that the use of MSO or NIS adjuvants could increase translaminar movement as was seen in the cabbage tests.

### What does this mean for users of Lannate® and Vydate®?

The two recent DuPont studies clearly demonstrate that a user can expect excellent translaminar movement of both Lannate® and Vydate® in plant leaves. Use of low spray volumes (high concentrations) will enhance the translaminar movement as will use of certain adjuvants.

Translaminar movement results in protection from hard to reach insects that feed on the underside of the leaf. In addition, the movement of Lannate® and Vydate® into the leaf means their insecticidal activity has been protected from UV degradation and from wash-off from rain or dew.

### For more information

Contact your local DuPont crop protection retailer or DuPont representative to learn more about DuPont™ Lannate® and Vydate® insecticides. And visit us on the Web at [cropprotection.dupont.com](http://cropprotection.dupont.com).

Table 3. Lannate® and Vydate® translaminar aphid control in squash and pepper

Insect and Host	Product	Rate (lb ai/A)	Volume (gal/A)	Translaminar Control (%)
Cotton/melon aphid ( <i>Aphis gossypii</i> ) on squash	Lannate®	1	40	56
		1	10	100
	Vydate®	1	40	95
		1	10	98
	Provado	0.031	40	66
		0.031	10	93
Green peach aphid ( <i>Myzus persicae</i> ) on pepper	Lannate®	1	30	68
		1	10	98
	Vydate®	1	30	97
		1	10	99
	Provado	0.045	30	100
		0.045	10	100

Lannate® LV, Lannate® SP, Vydate® C-LV and Vydate® L are restricted-use pesticides.

**This reference guide is not intended as a substitute for the product label for the product(s) referenced herein. Product labels for the above product(s) contain important precautions, directions for use and product warranty and liability limitations that must be read before using the product. Applicators must be in possession of the product label(s) at the time of application. Always read and follow all label directions and precautions for use when using any pesticide alone or in tank mix combinations.**

The DuPont Oval Logo, DuPont™, The miracles of science™, Lannate® and Vydate® are trademarks or registered trademarks of DuPont or its affiliates.

Provado is a registered trademark of Bayer CropScience.

Copyright © 2008 E.I. du Pont de Nemours and Company. All Rights Reserved. 12/08  
Reorder No.: K-15008



The miracles of science™