

## When to use imidacloprid versus dinotefuran

There are two main active ingredients in systemic insecticides used to treat HWA: **imidacloprid** and **dinotefuran**. Both chemicals are extremely effective at treating HWA because they are highly toxic to invertebrates (including insects). Their major differences are outlined below.

Imidacloprid	Dinotefuran
Effective within months of application	Effective within weeks of application
Remains active in the tree for 5-7 years	Remains active in the tree for 1-2 years
Best for light to moderate infestations on less stressed trees with moderately dense foliage	Best for heavy infestations, large trees, thinning foliage, or trees in more advanced stages of decline
Not effective for elongate hemlock scale (EHS) control	Also effective for elongate hemlock scale (EHS) control
Generally less expensive (generic versions available; previously patented by Bayer under the name Merit)	Generally more expensive (still under patent)
Brand names include: Merit, Zenith, Lada, Advanced Tree & Shrub Protect & Feed, CoreTect	Brand names include: Safari, Transtect

Where needed, dinotefuran can be used for an initial quick knock down of heavy infestations, followed by imidacloprid for longer HWA control, or both chemicals can be applied at the same time for the combined effect of quick action and longer protection. After initial treatment, imidacloprid alone may be sufficient and dinotefuran may not be needed depending on the level of re-infestation and tree health.

Refer to the product label for additional important information about mixing and application.

For more guidance on determining which products and application methods to use in various situations, visit the Treatment for Landowners page under the Resources tab on our website, [SaveHemlocksNC.org](http://SaveHemlocksNC.org).

Photo and Name of Dinotefuran Product	 Transtect	 Safari 20SG	 Zylam Liquid	 Transtect infusible
<b>Producer</b>	Rainbow Treecare	Valent	PBI-Gordon	Rainbow Treecare
<b>% Active ingredient</b>	70% Dinotefuran	20% Dinotefuran	10% Dinotefuran	22.5% Dinotefuran
<b>Formulation</b>	Water soluble packet	Soluble granule	Flowable liquid	Injectable
<b>Application Method</b>	Soil drench Bark spray	Soil drench/injection Basal bark spray	Soil drench/injection Basal bark spray	Stem injection
<b>Purchase At*</b>	Rainbow Treecare	Specialty ag stores	Specialty ag stores	Rainbow Treecare
<b>Volume of Container</b>	12 oz (20 x 0.6 oz packets)	12 oz or 3 pounds	1 quart	1 pint
<b>Avg. Cost Per Container**</b>	\$439	\$115 for 12 oz \$382 for 3 pounds	\$145	\$516
<b>Approx. Inches Per Container***</b>	100 - 340 inches	12 oz: 29 - 114 inches 3 pounds: 114 - 457 inches	40 - 178 inches	125 - 500 inches
<b>Lowest &amp; Highest Dose***</b>	Low: 17 inches/packet High: 5 inches/packet	Low: 9.5 inches/oz High: 2.4 inches/oz	Low: 5.5 inches/fl oz High: 1.25 inches/fl oz	Low: 1 inch/mL High: 0.25 inches/mL
<b>Cost Per Inch DBH***</b>	\$1.29 - \$4.39	12 oz: \$1.01 - \$4.03 3 pounds: \$0.84 - \$3.34	\$0.82 - \$3.63	\$1.09 - \$4.36
<b>Max Per Acre Per Year</b>	0.77 lb (0.54 lb active ingredient)	2.7 lb (0.54 lb of active ingredient)	78.9 fl oz (0.54 lb of active ingredient)	N/A
<b>Other Notes</b>		Defoaming agent helpful to add.		Liquid mix made exclusively for stem injection.

\*Various websites sell many of these products. \*\*Prices may vary by seller. \*\*\*Based on lowest and highest doses indicated on the label.

The use of brand names and any mention of commercial products or services in this publication does not imply endorsement nor discrimination against similar products or services not mentioned by Hemlock Restoration Initiative or NCDA&CS.

**This document has been compiled by the Hemlock Restoration Initiative, a program of WNC Communities, with funding and support from the NCDA&CS (Oct. 2020).**

Photo and Name of Imidacloprid Product									
	Merit 75WP	Merit 75WSP	Imidacloprid 75WSP	Imidacloprid 2F	BioAdvanced Tree & Shrub Protect & Feed†	BioAdvanced Tree & Shrub Protect & Feed†	CoreTect Tablets	IMA-jet 10	Xytect 10%
<b>Producer</b>	Bayer	Bayer	Generic	Generic	Bayer	Bayer	Bayer	Arborjet	Rainbow Treecare
<b>% Active ingredient</b>	75% Imidacloprid	75% Imidacloprid	75% Imidacloprid	21.4% Imidacloprid	0.74% Imidacloprid 0.37% Clothianidin	0.55% Imidacloprid 0.275% Clothianidin	20% Imidacloprid	10% Imidacloprid	10% Imidacloprid
<b>Formulation</b>	Wettable powder	Water soluble packet	Water soluble packet	Flowable liquid	Flowable liquid	Soluble granules	Slow release tablets	Injectable	Injectable
<b>Application Method</b>	Soil drench/injection	Soil drench/injection	Soil drench/injection	Soil drench/injection Basal bark spray	Soil drench	Apply to soil surface and water in	Place tablets 2 to 5 inches below soil surface	Stem injection	Stem injection
<b>Purchase At*</b>	Specialty ag stores	Specialty ag stores	Specialty ag stores	Specialty ag stores	General hardware stores	General hardware stores	Specialty ag stores	Arborjet distributors	Rainbow Treecare
<b>Volume of Container</b>	2 oz	6.4 oz (4 x 1.6 oz packets)	6.4 oz (4 x 1.6 oz packets)	Quart or gallon (other sizes also available)	Quart or gallon	4 pounds or 10 pounds	250 tablets	1 liter	1 liter
<b>Avg. Cost Per Container**</b>	\$42	\$85	\$32	\$46 for quart \$78 for gallon	\$19 for quart \$70 for gallon	\$25 for 4 pounds \$50 for 10 pounds	\$107	\$436	\$363
<b>Approx. Inches Per Container***</b>	30 - 60 inches	96 - 192 inches	96 - 192 inches	Quart: 160 - 320 inches Gallon: 640 - 1280 inches	Quart: 10 inches Gallon: 40 inches	4 pounds: 10 inches 10 pounds: 26 inches	83 - 125 inches	167 - 1000 inches	167-1000 inches
<b>Lowest &amp; Highest Dose***</b>	Low: 30 inches/oz High: 15 inches/oz	Low: 48 inches/packet High: 24 inches/packet	Low: 48 inches/packet High: 24 inches/packet	Low: 10 inches/oz High: 5 inches/oz	N/A	N/A	Low: 2 tablets/inch High: 3 tablets/inch	Low: 1 mL/inch High: 6 mL/inch	Low: 1 mL/inch High: 6 mL/inch
<b>Cost Per Inch DBH***</b>	\$0.70 - \$1.40	\$0.44 - \$0.85	\$0.17 - \$0.33	Quart: \$0.14 - \$0.29 Gallon: \$0.06 - \$0.12	Quart: \$1.87 Gallon: \$1.72	4 pounds: \$2.43 10 pounds: \$1.92	\$0.86 - \$1.28	\$0.44 - \$2.62	\$0.36 - \$2.18
<b>Max Per Acre Per Year</b>	8.6 oz (0.4 lb of active ingredient)	8.6 oz or 5.33 packets (0.4 lb of active ingredient)	8.6 oz or 5.33 packets (0.4 lb of active ingredient)	25.6 fluid oz (0.4 lb active ingredient)	393 fluid oz	25.05 pounds	450 tablets (0.5 lb of active ingredient)	N/A	N/A
<b>Other Notes</b>	Name brand imidacloprid product. Powder not contained once jar is opened.	Name brand imidacloprid product.	Generic for Merit 75WSP Names include: Adonis, Criterion, Malice, Mallet, Quali-Pro, Xytect, Zenith	Generic for Merit 2F Names include: Adonis, ImidaStar, Lada, Prime Source, Quali-Pro, Xytect, Zenith  Other sizes are 27.5 oz, 40 oz, and 2.5 gal	Not to be confused with Bayer Complete Insect Killer which is for turf, not trees. Includes fertilizer.  †Active ingredients are for the "Concentrate II" product.	Not to be confused with Bayer Complete Insect Killer which is for turf, not trees. Includes fertilizer.  †Active ingredients are for the "Concentrate II" product.	Tablets dissolve slowly over time. Additional water not required.  Includes fertilizer.	Liquid mix made exclusively for stem injection.	Liquid mix made exclusively for stem injection.

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