

A Guide to Successful Propagation



ESI-ROOT

The New Propagation Solution - ESI-ROOT

Esi-Root is a unique scientifically formulated and tested rooting solution, that offers superior striking of most cuttings over conventional striking compounds. The one convenient Esi-Root product can be used for both hardwood and softwood cuttings, and easy to strike and hard to strike species. Simply alter the dilution ratios accordingly.

Two Active Ingredients - Esi-Root contains two hormones, 4-Indol-3-yl-Butyric Acid (IBA) and 1-Naphthlacetic Acid (NAA). Most conventional cutting compounds contain IBA alone. However, research has shown that a combination of IBA and NAA is generally more effective than IBA alone.

Better Performance - Esi-Root maximises the effectiveness of the delivery system, ensuring more active hormone being available at the cutting site. This has three advantages.

- Increased strike rates
- Faster callus and root development
- No 'burning' of the cutting

Increased Production - Due to the nature of the Esi-Root formulation, cuttings may be dipped or soaked. Large runs may be cut directly into a prepared bath (at the correct dilution) and soaked for an hour or two prior to being placed in the propagation medium.

Cost Effective - Esi-Root may be diluted as low as 2.5mls into 1 litre of water. A 500ml dispenser of Esi-Root will treat many thousands of cuttings.

General hints for using Esi-Root solution

Take cuttings just below a node or leaf axil and remove the lower leaves. Make a 10mm split up the base of the cutting and dip the cutting in Esi-Root solution to just cover the split. This increases the cutting surface area and helps the uptake of the hormone solution.

Another method is wounding of species difficult to root or those that have older wood at the base. The wound is made by slicing about 20mm of the outer tissue on both sides of the base of the cutting with a sharp grafting knife or razor blade.

As a general rule cuttings may be classified in three types;

- Softwood (spring growth)
- Semi-hardwood (summer/autumn)
- Hardwood (winter, of the previous seasons growth)

Softwood Cuttings

Dipping- dip the base of the cutting to a depth of 20mm into a prepared solution of 10mls Esi-Root into one litre of water.

Soaking - Take soft leafy stem cuttings early in the day and avoid wilting by cutting directly into a prepared solution of Esi-Root, at a dilution rate of 2.5mls into one litre of water. Totally immerse for up to five minutes.

For more mature softwood cuttings dip the base of the cutting in a solution of 25mls Esi-Root in one litre of water or totally immerse the cutting in a weaker solution of 7.5mls of Esi-Root in one litre of water for up to five minutes.

Semi-Hardwood Cuttings

If unfamiliar with the species sensitivity to auxins, test a few cuttings at differing concentrations and different methods. Burn will usually show within seven days. If there is no burn or you are familiar with the species response to auxins, either dip or totally immerse the cutting as set out above in a prepared solution of 25mls Esi-Root into 1 litre of clean water as set out above.

Hardwood Cuttings

There are two different methods that can be used for the striking of hardwood cuttings:

Dipping- Dip the base of the cutting to a depth of 20mm into a prepared solution of 25mls Esi-Root into one litre of water. Store cuttings until callused. Place in the propagation medium to a depth of 50% of the cutting length.



Species	Method	Timing	Esi Root Rate
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Soaking- Totally immerse the hardwood cutting into a prepared solution of 7.5mls Esi-Root into one litre of water and soak for up to 24 hours. Place in the propagation medium.

Difficult to Strike Species

For certain species that are extremely difficult to strike, test a few cuttings by dipping them into undiluted Esi-Root solution. If callus forms and there is no burning within 7 days, proceed to full scale production.

Note: If unfamiliar with sensitivity of any species to auxins, test a few cuttings at different concentrations before undertaking full scale production. Burning will usually show within seven days. If burning shows, adjust the concentration and test again. **This booklet is a guide only.**

Esi-Root Solution Dilution Rates

Low Concentration	10mls Esi-Root to 1 litre Water
High Concentration	25mls Esi-Root to 1 litre Water

The following table sets out the preferred propagation methodology and dilution rates required. Methods are based on Sydney conditions and may be varied to suit your conditions.

Species	Method	Timing	Esi Root Rate
Abelia	Semi hardwood	Dec-May	Low Concentration
Abutilon	Soft tip	Sept-May	Low Concentration
	Layering	Sept-May	N/A
Acalypha	Soft tip	Sept-Nov	Low Concentration
Acanthus	Root cuttings	Aug-Sept	N/A
Acer cultivars	Bud or graft	July-Aug	N/A
Acer megundo	Hardwood	June-July	High Concentration 15 minute soak
	Budding	June-July	N/A
Actinotis	Soft tip	Nov-March	Low Concentration
Adenandra	Soft tip	Sept-March	Low Concentration
Agonis flexuosa 'Variegata'	Semi hardwood	Dec-March	Low Concentration
	Graft seedling stocks	Aug-Sept	N/A
Allamanda	Soft tip	Aug-Oct	Low Concentration
Antigonon	Semi hardwood	Dec-March	Low Concentration
Aphelandra	Soft tip	Sept-March	Low Concentration
Arbutus	Semi hardwood cuttings	Dec-Jan	High Concentration
Aristolochia	Seed	Sept-Nov	N/A
Astartia	Semi hardwood	Feb-March	Low Concentration
Aucuba	Semi hardwood	May-July	Low Concentration

Species	Method	Timing	Esi Root Rate
Azalea	Semi hardwood	Dec-Feb	Low Concentration
	Layering	Aug-Sept	N/A
Azara	Cutting with heel	Sept-Nov	High Concentration
Baeckia	Semi hardwood	Dec-Feb	Low Concentration
Banksia	Semi hardwood	Dec-April	Low Concentration
Baurea	Soft tip	Sept-Oct	Low Concentration
Begonia rex	Leaf	All seasons	Low Concentration
Begonia coccinea	Semi hardwood	Dec-March	Low Concentration
Begonia semperflorens	Leaf, stem	Aug-Sept	Low Concentration
Begonia tuberosus	Leaf	Nov-Dec	Low Concentration
Berberis	Soft tip	Sept-April	Low Concentration
	Hardwood	June-July	High Concentration
Betula	Graft seedling stocks	April-May	N/A
Bignonia	Semi hardwood	Dec-Feb	High Concentration
Boronia	Soft tip	Sept-Nov	Low Concentration
Bougainvillea	Hardwood	Warm climates -	High Concentration
		all seasons	
Bouvardia	Fleshy roots 75mm long	Aug-Oct	N/A
Brachychiton	Graft seedling stocks	Sept-Nov	N/A
Brachysema	Soft tip	March-April	Low Concentration
Brunfelsia	Soft tip	Sept-Oct	Low Concentration
Buddleia	Soft tip	Sept-Oct	Low Concentration
	Semi hardwood	March-May	Low Concentration
	Hardwood	July-Aug	High Concentration
Buxus	Soft tip	Sept-Nov	Low Concentration
	Semi hardwood	March-May	Low Concentration
Calliandra	Semi hardwood	March-May	Low Concentration
Callicarpa	Semi hardwood	Dec-March	Low Concentration
Callistemon	Semi hardwood	Dec-June	High Concentration
Calocephalis	Semi hardwood	Dec-Jan	Low Concentration
Calodendron	Graft seedling stocks	September	N/A
Camellia japonica	Leaf bud	Dec-March	Low Concentration
	Semi hardwood	Dec-March	Low Concentration
	Graft onto sasanqua root stocks	Sept-Nov	N/A
	Layering	Sept-Nov	N/A
	Cutting graft	March-April	Low Concentration

Species	Method	Timing	Esi Root Rate
Camellia reticulata	Graft onto sasanqua root stocks	June-July	N/A
Camellia sasanqua	Leaf bud	Dec-March	Low Concentration
	Semi hardwood	Dec-March	Low Concentration
Campsis	Soft tip	Sept-Nov	Low Concentration
Caryopteris	Hardwood	June-July	High Concentration
Cassia	Semi hardwood	Dec-March	High Concentration
Casuarina	Soft tip	March-May	Low Concentration
Catalpa	Semi hardwood	Dec-Feb	High Concentration
Ceanothus	Soft tip	Sept-Nov	Low Concentration
Cedrus	Graft seedling stocks	Aug-Sept	N/A
Ceratopetalum	Semi hardwood	Dec-Feb	Low Concentration
	Budding seedling stocks	Aug-Sept	N/A
Ceratostigma	Soft tip	Sept-Nov	Low Concentration
Cestrum	Soft tip	Sept-Nov	Low Concentration
Chaenomeles	Root cuttings	June-July	N/A
	Hardwood	June-July	High Concentration
Chamaecyparis	Semi hardwood	March-June	High Concentration
Chamaelaucium	Semi hardwood	Jan-Feb	Low Concentration
Chimonanthus	Semi hardwood	Jan-March	High Concentration
Choisya	Soft tip	Sept-Nov	Low Concentration
Chorizema	Semi hardwood	September	Low Concentration
Chrysanthemum	Soft tip	Sept-Nov	Low Concentration
Cissus	Soft tip	Nov-Dec	Low Concentration
Cistus	Semi hardwood	Dec-Feb	Low Concentration
Citharexylum	Semi hardwood	Dec-March	Low Concentration
Clematis	Semi hardwood	Nov-Feb	Low Concentration
Clerodendron	Soft tip	Sept-Oct	Low Concentration
Cobea	Semi hardwood	Sept-March	High Concentration
Codiaeum	Semi hardwood	Nov-March	Low Concentration
Coleonema	Soft tip	April-May	Low Concentration
Coleus	Soft tip	Dec-March	Low Concentration
Columnnea	Soft tip	Sept-March	Low Concentration
Coprosma	Semi hardwood	Sept-Dec	Low Concentration
Cordyline	Semi hardwood	Dec-March	Low Concentration

Species	Method	Timing	Esi Root Rate
Cornus florida	New growth cuttings	Oct-March	Low Concentration
	Grafting or budding	July-March	N/A
Correa	Semi hardwood	Jan-March	High Concentration
Cotinus	Soft tip	Sept-Nov	Low Concentration
Cotoneaster	Soft tip	Sept-Nov	Low Concentration
	Semi hardwood	Dec-March	Low Concentration
Cryptomeria	Semi hardwood	Feb-June	Low Concentration
Cuphea	Soft tip	Sept-Dec	Low Concentration
Cupressus	Semi hardwood	Feb-June	Low Concentration
Cytisus	Soft tip	Aug-Nov	Low Concentration
Daboecia	Soft tip	Aug-Sept	Low Concentration
Daerydium	Semi hardwood	April-July	Low Concentration
Dais	Semi hardwood	Oct-Nov	High Concentration
Dampiera diversifolia	Soft tip	Sept-Nov	Low Concentration
Daphne	Semi hardwood	Dec-Jan	Low Concentration
	Simple layering	Dec-Jan	N/A
Datura	Soft tip or hardwood	Any time	Low Concentration
Deutzia	Hardwood	June-July	High Concentration
Dodonaea	Semi hardwood	Dec-March	Low Concentration
Dombeya	Soft tip	Sept-Nov	Low Concentration
Doxantha	Semi hardwood	Dec-April	Low Concentration
Draceana	Stem cuttings and air layering	Dec-March	Low Concentration
Drejerella	Soft tip	Sept-Nov	Low Concentration
Duranta	Semi hardwood	March-May	Low Concentration
Echium	Semi hardwood	After flowering	Low Concentration
Eleagnus	Semi hardwood	Dec-Feb	Low Concentration
Epacris	Semi hardwood	Dec-March	Low Concentration
Erica	Semi hardwood	Dec-Jan	Low Concentration
Eriostemon	Semi hardwood	March-May	Low Concentration
Erythrina	Hardwood	June-July	Low Concentration
Escalonia	Soft tip	Sept-Nov	Low Concentration
Euonymus	Semi hardwood	Nov-May	Low Concentration
Eupatorium	Semi hardwood	March-May	Low Concentration
Euphorbia	Hardwood - partially dry		
	for 1-2 days	Sept-Oct	High Concentration

Species	Method	Timing	Esi Root Rate
Euryops	Soft tip	Sept-March	High Concentration
Exochordia	Soft tip	Nov-Dec	Low Concentration
	Layering	Nov-Dec	N/A
Fagus	Graft seedling stocks	March-May	N/A
Fatsia	Semi hardwood basal shoots	Sept-Nov	Low Concentration
Feijoa	Semi hardwood	March-Apr	High Concentration
Felicia	Semi hardwood	Sept-May	Low Concentration
Ficus hillii	Semi hardwood	March-May	Low Concentration
Ficus parcellii	Hardwood	Aug-Sept	High Concentration
Ficus elastica 'Decora'	Leaf stem	Sept-Nov	Low Concentration
Ficus mimina	Semi hardwood	Dec-March	Low Concentration
Ficus pumila	Semi hardwood	Dec-March	Low Concentration
Fittonia	Soft tip	Sept-March	Low Concentration
Forsythia	Hardwood	June-July	Low Concentration
Fraxinus	Cultivars budded	Nov-Dec	N/A
Fuchsia	Soft tip	Sept-Feb	Low Concentration
Gardenia	Semi hardwood	March-April	Low Concentration
Garrya	Semi hardwood	March	High Concentration
Gelsemium	Semi hardwood	Dec-April	Low Concentration
Genista	Soft tip	Sept-Nov	Low Concentration
Ginkgo	Semi hardwood	June-July	High Concentration
Gleditsia	Hardwood	September	High Concentration
	Cultivars grafted	July-Aug	N/A
Goldfussia	Semi hardwood	Dec-April	Low Concentration
Gompholobium	Semi hardwood	Nov-March	Low Concentration
Gordonia	Semi hardwood with heels	Feb-March	Low Concentration
	Layering	Sept-Oct	N/A
Grevillea	Soft tip	March-April	Low Concentration
Hakea	Semi hardwood	Dec-April	Low Concentration
Hardenbergia	Semi hardwood	Dec-March	Low Concentration
Hebe	Soft tip	Sept-April	Low Concentration
Hedera	Cuttings from non-fruiting wood	Sept-April	Low Concentration
Heliotropium	Soft tip	Sept-Nov	Low Concentration
Hemiandra	Semi hardwood	Dec-March	Low Concentration

Species	Method	Timing	Esi Root Rate
Hibertia	Semi hardwood	Dec-March	Low Concentration
Hibiscus rosa-sinensis	Firm soft tip	Dec-March	Low Concentration
Hibiscus syriacus	Hardwood	June-July	Low Concentration
Holmskiolda	Soft tip	Sept-Feb	Low Concentration
Hoya	Semi hardwood	Oct-Dec	Low Concentration
Hydrangea	Soft tip	October	Low Concentration
	Leaf bud	October	Low Concentration
Hypericum	Soft wood	Sept-Feb	Low Concentration
Hypocalymma	Semi hardwood	Dec-March	Low Concentration
Ilex	Semi hardwood	Feb-March	Low Concentration
Iochroma	Semi hardwood	Dec-March	Low Concentration
Isopogon	Semi hardwood	Feb-March	Low Concentration
Ixora	Soft tip	Nov-Dec	Low Concentration
Jacaranda	Graft seedling stocks	March-May	N/A
Jasminum	Semi hardwood	Sept-Feb	Low Concentration
Juniperus	Semi hardwood	March-July	Low Concentration
Kalmia	Simple layering	March-April	N/A
Kennedya	Semi hardwood	Dec-Feb	Low Concentration
Kerria	Semi hardwood	Dec-Feb	Low Concentration
Koelreuteria	Soft tip	Sept-Nov	Low Concentration
Kolkwitzia	Semi hardwood	April-May	Low Concentration
Kunzea	Semi hardwood	Feb-April	Low Concentration
Laburnum	Budded/grafted	Sept-Oct	N/A
Lagerstroemia	Hardwood	June-July	High Concentration
Lambertia	Semi hardwood	Feb-April	Low Concentration
Lantana	Soft tip	Sept-May	Low Concentration
Lavendula	Soft tip with heel	September	Low Concentration
Leonotis	Soft tip	Sept-Feb	Low Concentration
Leptospermum	Semi hardwood	May-June	Low Concentration
Leschenaultia	Soft tip	Sept-Nov	Low Concentration
Leucothoe	Soft tip	Sept-Nov	Low Concentration
Libocedrus	Semi hardwood	Dec-May	Low Concentration
Ligustrum cultivars	Semi hardwood	Dec-Feb	Low Concentration
Liquidambar cultivars	Shield bud seedling rootstocks	Dec-March	N/A

Species	Method	Timing	Esi Root Rate
Liriodendron	Grafting	Sept-Nov	N/A
Lonicera	Soft tip	Dec-Feb	Low Concentration
Loropetalum	Semi hardwood	Sept-Oct	Low Concentration
Luculia	Seed	Sept-Nov	N/A
	Simple layering	Sept-Nov	N/A
Macadamia cultivars	Graft onto seedling rootstocks		N/A
Magnolia deciduous	Semi hardwood	Dec-Feb	High Concentration
	Simple layering	April-May	N/A
Magnolia evergreen	Simple layering	April-May	N/A
Mandevilla	Semi hardwood	Dec-March	Low Concentration
Manettia	Soft tip	Nov-Feb	Low Concentration
Melaleuca	Softwood	Sept-Nov	Low Concentration
	Semi hardwood	Dec-March	Low Concentration
Melastoma	Soft tip	Sept-March	Low Concentration
Metasequoia	Soft tip	Oct-May	High Concentration
Metrosideros	Semi hardwood	July	Low Concentration
Michelia	Semi hardwood	Sept-March	Low Concentration
Monstera	Nodal lengths 100-150mm	Oct-March	Low Concentration
Morus alba	Softwood	Dec-March	Low Concentration
Murraya	Semi hardwood	March-April	Low Concentration
Mussaenda	Semi hardwood	Dec-March	Low Concentration
	Soft tip	Sept-Nov	Low Concentration
Myoporum	Soft tip	Sept-Mar	Low Concentration
Myrtus	Semi hardwood	Dec-March	Low Concentration
Nandina domestica 'Nana'	Semi hardwood	Dec-March	Low Concentration
Nerium	Semi hardwood	Sept-Feb	Low Concentration
Olea africana	Semi hardwood	Dec-March	Low Concentration
Osmanthus	Variegated forms soft tip	Sept-May	Low Concentration
Pandorea	Soft tip	Sept-Mar	Low Concentration
Parthenocissus	Soft tip	Dec-March	Low Concentration
	Hardwood	Aug-Sept	High Concentration
Passiflora	Grafting	Sept-Oct	N/A
Pedilanthus	Soft tip	Sept-Mar	Low Concentration
Pelargonium	Soft tip	All year	Low Concentration

Species	Method	Timing	Esi Root Rate
Pentas	Semi hardwood	Nov-March	Low Concentration
Pepperomia	Leaf	Sept-March	Low Concentration
Philadelphus	Hardwood	June-July	Low Concentration
Philodendron	Cuttings soft tip and leaf bud	Sept-March	Low Concentration
Photinia glabra 'Robusta'	Semi hardwood	June-July	High Concentration
Photinia glabra 'Rubens'	Semi hardwood	Nov-Dec	High Concentration
Picea cultivars	Grafted seedling rootstock of same spp.		N/A
Pieris	Soft tip	Sept-Dec	Low Concentration
Pimellea	Soft tip	Nov-Dec	Low Concentration
Pittosporum cultivars	Semi hardwood	March-April	Low Concentration
Platanus	Hardwood	June-July	High Concentration
Platyladus	Semi hardwood	Dec-May	Low Concentration
Plumbago	Semi hardwood	Sept-Oct	Low Concentration
Plumeria	Ripe tip, dry for 5 days	Sept-Oct	Low Concentration
Podalyria	Soft tip	Sept-Feb	Low Concentration
Podocarpus	Semi hardwood	Feb-Apr	Low Concentration
Polygala	Soft tip	Dec-May	Low Concentration
Pomaderris	Semi hardwood	Feb-Apr	Low Concentration
Populus	Hardwood	June-July	High Concentration
Portulacaria	Cuttings	Sept-April	Low Concentration
Prostanthera	Semi hardwood	March-April	Low Concentration
Prunus lauroceracus	Hardwood	June-July	High Concentration
Prunus glandulosa	Root	June-July	N/A
Prunus cultivars	Shield budded	Nov-Dec	N/A
Punica	Hardwood	June-July	High Concentration
Pyracantha	Semi hardwood	April-May	Low Concentration
Pyrostegia	Semi hardwood	Dec-May	Low Concentration
Quisqualis	Soft tip	Sept-March	Low Concentration
Raphiolepis	Semi hardwood	Dec-May	Low Concentration
Reinwardtia	Soft tip	Aug-Sept	Low Concentration
Rhododendron	Semi hardwood	Nov-Dec	Low Concentration
	Simple layering	Sept-Nov	N/A
	Aerial layering	Sept-Nov	N/A
	Leaf bud	March-May	Low Concentration

Species	Method	Timing	Esi Root Rate
Robinia cultivars	Grafted	June-July	N/A
Rondoletia	Semi hardwood	Oct-Nov	Low Concentration
Rose	T budding	Feb-March	N/A
Rose miniature	Hardwood	June-July	High Concentration
Rosemarinus	Semi hardwood	Dec-April	Low Concentration
Russelia	Semi hardwood	Sept-Nov	Low Concentration
Sabina	Semi hardwood	March-July	Low Concentration
Saintpaulia	Leaf cuttings and division - glasshouse	All seasons	N/A
Salix	Hardwood	June-July	High Concentration
Sambucus	Hardwood	June-July	High Concentration
Sansevieria	Leaf cuttings and division	All seasons	N/A
Solandra	Semi hardwood	Nov-March	Low Concentration
Solanum	Hardwood	June-Aug	High Concentration
Sophora	Semi hardwood	Sept-March	Low Concentration
Spathodea	Soft tip	Sept-March	Low Concentration
Spiraea	Soft tip	Jan-March	Low Concentration
Stachyurus	Semi hardwood	Dec-Jan	Low Concentration
Stephanotis	Semi hardwood	Oct-Nov	Low Concentration
Stenocarpus	Seed or graft	Sept-Oct	N/A
Streptosolen	Semi hardwood	Oct-May	Low Concentration
Syringa	Budded onto privet		
Syzygium	Semi hardwood	Dec-March	Low Concentration
Tamarix	Hardwood	June-July	High Concentration
Tecoma	Semi hardwood	Dec-April	Low Concentration
Tecomaria	Semi hardwood	Dec-April	Low Concentration
Telopea	Cuttings with new growth	September	Low Concentration
Thryptomene	Semi hardwood	Sept-May	Low Concentration
Thunbergia	Semi hardwood	Oct-Dec	Low Concentration
Thuya	Semi hardwood	Dec-May	Low Concentration
Tibouchina	Soft tip	Sept-March	Low Concentration
Trachelospermum	Semi hardwood	Sept-March	Low Concentration
Tristania cultivars	Graft - top cleft	July-Aug	N/A
	Graft - splice approach	Aug-Sept	N/A
Ugni	Semi hardwood	Nov-Feb	Low Concentration

Species	Method	Timing	Esi Root Rate
Ulex	Semi hardwood	March-April	Low Concentration
Viburnum evergreen	Semi hardwood	Nov-April	Low Concentration
Viburnum deciduous	Hardwood	June-July	High Concentration
	Grafting	June-July	N/A
Vitex	Hardwood	June-July	High Concentration
Vitis	Simple layering	March-May	N/A
Weigela	Soft tip	Sept-March	Low Concentration
	Hardwood	June-July	High Concentration
Westringia	Semi hardwood	March-May	Low Concentration
Wisteria	Hardwood	September	High Concentration
	Compound layering	September	N/A
	Root	June-July	N/A
	Grafting	Aug-Sept	N/A
Xylosma	Semi hardwood	Feb-April	Low Concentration
Ziera	Semi hardwood	Dec-March	Low Concentration

Esi-Root Concentrate and Ezi-Root Gel come in a range of sizes and quantities to suit your different plant propagation needs.

To learn more about the Esi-Root range of products, visit esi-root.com

