

# 2022 Clone Guide





#### Hybrid Clone Consortium

For over twenty years a hybrid breeding consortium has been funding research and testing clones for independent timber growers in the forestry industry. Recently, NCT together with TWK and affiliated clonal nurseries - CPS Seedlings, Ezigro Seedlings, Sunshine Seedlings, Sutherland Seedlings and Top Crop have, have formed a non-profit company to continue managing this programme (Hybrid Clone Consortium-HCC). Highlights of this programme include: the development of GN 2107, one of the most widely and successfully grown GxN clones in the industry today; the development of GU 400 and 412 at the height of the L. invasa infestations to help growers combat this pest; and the release of the first South African black wattle clones to the market. There are now over well over 100 hybrid trials planted across a wide range of South African forestry sites. The resulting database is growing every year. This information is crucial to understanding where to plant particular clones. Information on growth, disease and wood properties is steadily being built up for each of the recommended commercial clones. Over the last 15 years nursery practises have improved and clones are now produced through mini-cuttings rather than larger macro-cuttings. These mini-cuttings form a tap-root like root system which more closely resembles the root architecture of a seedling. More recently the paper pot revolution has been introduced to forestry nurseries and this has improved the quality of the root plug and ease of handling of clonal cuttings. Through improvements in nursery practises and careful monitoring of trials, hybrid clones are now widely tried and trusted!



# Planting Clones

#### Clones are cuttings not seedlings

- > They have a higher shoot to root ratio so plant a slightly larger clone than its seedling counterpart.
- Cuttings lack a seedlings strong taproot so encourage a downwards sinker by preparing a deep pit.
- > Avoid shallow rip lines which will encourage lateral root growth and will result in higher levels of windthrow.
- Make sure the root plug is not rootbound, a well consolidated root plug with heathy white shoots will promote normal root growth and reduce windthrow.

#### Most clones have quicker draining media

- This means the root plug loses water quicker than usual seedlings, so ensure the plug stays wet before planting, Paper pot plugs (Ellepot) take longer to saturate.
- Clones are available in Unigro's and Paper Pots Unigro's have black inserts which heat up rapidly quickly, whilst Paper Pots drain from a large surface area so need to be watered even more.
- Ensure your labour is trained to handle these different types of plugs



# **GxN Clone Programme**

#### Where to plant GxN clones

- Plant on high-potential, mid-altitude sites
- Altitude range of 1100m 1500m
- Avoid areas of heavy Leptocybe invasa infestation
- Avoid very shallow or marginal sites

#### Why plant GxN clones

- Better growth rates
  - Up to 30% higher MAIs than seedlings on suitable sites
- Better uniformity and form
  - Clones are genetically identical so have a higher recovery of utilisable timber
- More marketable poles and sawn timber than *E. dunnii* 
  - Some have been tested by the South African Utility Pole Association
- Better frost and snow tolerance than *E. dunnii* and *E. smithii* 
  - Results show less frost damage than *E. smithii*
  - Results show less snow damage than *E. dunnii* and *E. smithii*

Clone	Number of block trials		8yr Volume	Density	Pulping	Pole retention	Snow tolerance	Frost tolerance
number	4yr Results	8yr Results	(against Grandis)	(against Grandis)	(against Grandis)	(against Grandis)	(against Dunnii)	(against Dunnii)
GN 2107	14	8	39%	12%	-1%	NA	28%	9%
GN 018b	14	8	27%	12%	0%	-15%	18%	-1%
GN 010	14	8	27%	5%	NA	-20%	24%	7%
E.grandis	9	6	NA	NA	NA	NA	NA	NA
E.dunnii	11	9	-2%	30%	-1%	Failed	NA	NA
E.smithii	11	7	-13%	33%	1%	Failed	-1%	-16%



# GN 2107

#### **Top Performer**

- Our top performing GxN clone in the KwaZulu-Natal midlands and Northern KZN. Significantly better than any of our other current clones on high potential sites. Not recommended for areas below 1100m, due to its high susceptibility to *Leptocybe invasa* (Gall wasp).
- 4-year block trial results from 14 sites and 8-year results from 8 sites. From these 14 trial results it is the top performing commercial clone in 10 of them.
- Shows good bacterial blight, snow and frost tolerance.

# GN 018b and GN 010

#### Tried and tested

- These 2 clones have been in the programme for a long time and have been well tested across the GxN range, they have been proven to be reliable clones.
- These 2 clones have been tested by the South African Utility Pole Association and were passed as pole producers
- Being older clones, there may be some mixing within the clone banks, however DNA fingerprinting methodology has helped 'clean up' the clone integrity in recent years.



# GN 350

- This is a new generation clone that has recently been released to nurseries. It is available for farmers who are currently planting too much GN 2107 to test in small compartment blocks. Feedback from these blocks as well results from continuing block trials will dictate the future of this clone
- GN 350 has done extremely well on good sites above 1200m. Avoid planting this clone on marginal GN sites



# **GxU Clone Programme**

#### Where to plant GxU clones

- Plant on Sub tropical and warm temperate sites
- Altitude range of 0m 1100m
- Avoid areas of frost and snow
- Avoid very shallow or marginal sites

#### Why plant GxU clones

- Better growth rates
  - Up to 20% higher MAIs than seedlings on suitable sites
- Better uniformity and form
  - Clones are genetically identical so have a higher recovery rate
- Similar wood properties and markets to *E. grandis* 
  - In some cases better
- Heavy canopy
  - Fast canopy closure reduces inter-row weeding expenses
- Better tolerance to Leptocybe invasa
  - The recommended GxUs are more tolerant than *E. grandis*

## GU 411, GU 483 and GU488

- These 3 clones have been in the programme for a long time and have been re-released as new numbers based on cleaning up mixes and selecting top performing trees from trials. They have been fingerprinted for their new identity.
- -GU 411 is the best volume producing GxU in the programme for midaltitude, high potential sites. It has a low wood density.
  -GU483 has a relatively high wood density and a good stem form. -GU 488 can handle slightly drier sites.
- These clones are not recommended for the Zululand coastal plain.



# GU 400 and GU 412

#### Bred for *Leptocybe*

- These 2 clones were both fast tracked specifically to deal with the high incidence of *L. invasa p*revalent in the SA forestry landscape a few years ago.
- GU 400 has since proven itself an excellent volume producer, whilst GU 412 has a much better form.
- These 2 clones are both suited to the coastal plain and being relatively new to the programme have a high integrity and show very little signs of mixing.

# Gx Mac 92 and Gx Smithii 211

- Gx Mac 92 has better frost tolerance than *E. dunnii* and is more vigorous with better form and strip-ability compared to *E. macarthurii.*
- G x Smithii 211 is more vigorous and shows better pest and disease resistance compared to *E. smithii*.
- Numbers of these 2 clones are limited, but enough material is available for testing in trial blocks.



### SU 107 and GL 222

#### Higher density

- SU 107 is a *Saligna x Urophylla* hybrid originally bred for sawtimber. It grows well on mid-altitude, high potential sites, with similar site requirements to GU111. However, SU 107 has a significantly higher wood density.
- GL 222 is a *Grandils x Longirostrata* hybrid clone. It has a lighter canopy than a GxU hybrid, but it can handle more heat and marginal soils. GL 222 has a density in the Wattle range.
- Availability of these 2 clones are limited, but enough material for trial plantings is available.

Wattle Clone Programme

#### Where to plant wattle clones

- Plant rust tolerant clones (SPs or AFs) on good wattle sites or sites prone to rust infection – do not plant rust clones in frost areas!
- Plant frost tolerant clones (FWs) on historic wattle sites, that more recently are exposed to some frost risk.
- Avoid very exposed sites prone to windthrow and avoid planting root bound clones.

#### Why plant wattle clones

- Better growth rates (Rust clones)
  - Rust tolerant clones show significantly higher MAIs than seedlings on suitable sites
- Better frost tolerance (Frost clones)
  - Frost tolerant clones show significantly less damage when exposed to frost than seedlings, however, they are not frost resistant.
- Better uniformity and form
  - Clones are genetically identical so have less runts and need less thinning and pruning.

### The Results

2yr growth results (no frost) - Rust clones show improved growth over seedlings, but are more susceptible to frost

Catagony	BA/ha				
Calegory	Rank	m <sup>2</sup>	Groups		
AF 01	1	7,6	Α		
AF 12	2	6,7	AB		
SP 145	3	6,3	ABC		
SP 644	4	6,0	BCD		
PSO 11	5	5,3	CDE		
FW 46	6	4,9	DEF		
FW 47	7	4,7	DEF		
FW 40	8	4,2	EF		
FW 54	9	3,9	F		
FW 41	10	3,8	F		
FW 34	11	3,8	F		
FW 44	12	3,6	F		

Frost damage results - Frost clones should only be planted in areas likely to experience frost

Treatment	Frost				
i i o u tin o ne	Rank	Damage	Groups		
FW 47	1	1,5	Α		
FW 54	2	1,6	Α		
FW 40	3	1,6	Α		
FW 41	4	1,7	Α		
FW 46	5	2,3	Α		
FW 44	6	2,7	AB		
PSO 11	7	4,1	BC		
AF 01	8	4,1	BC		
AF 11	9	5,0	CD		
AF 12	10	5,0	CD		
SP 644	11	5,4	CD		
SP 145	12	5,9	D		





#### Pioneer

- SP 644 is the first commercial rust wattle clone to be released into the South African forestry industry and has been fast tracked to combat the huge impact of the wattle rust.
- SP 644 shows increased rust tolerance when compared to current commercial seedlings and shows increased growth rates and better uniformity.
- SP 644 is readably available at affiliated nurseries, there is some anecdotal evidence of higher rates of wind throw. Ensure the clones you purchase have good root plug qualities.

# AF 01

#### **Top Performer**

- AF 01 is currently the top performing rust wattle clone in terms of growth and shows significant gains over SP 644 both in terms of growth and rust tolerance.
- AF 01 is new to the nurseries and production will be limited for the next few seasons.





#### Frost tolerant

- FW 54 is currently the only frost tolerant wattle clone on the market. It is significantly more tolerant to frost than seedlings but it is not frost resistant. Plant early in the summer months.
- FW 54 shows no growth advantage over commercial seedlings and in most case may show a slight reduction in volume. This clone is therefore specifically for frost areas, if there is no frost risk do not plant this clone.
- FW 54 is available from affiliated nurseries, but currently only in