

July 22nd, 2016

Dear Evelyn,

Thank you for the work you did to send us observations for the selection candidates. With some input from Gary, I have created a list of 30 selections from the list of 140 candidates. These can be identified as the population that you will eventually move into a clonal orchard. Of course, they should be well marked for future use. You should now thin the trial to create a seed stand of high genetic value. The process for thinning is not so simple as cutting everything other than the 140 candidates. This is a modification from the work plan in the original letter and I will explain below. First, I want to explain the process used for making the selection of 30 trees.

Using the list of 140 candidates, I used the following guidelines:

- Select no more than 2 trees from any one family
- Select trees with the highest % gain (this ranged from 0 to 30%)
- Avoid trees that had any defect (fork, crookedness, or other) recorded from your recent observations or the age 8 measurements
- Include as many families as possible

Some deviations from these guidelines were made. A few trees with defects were selected due to their very high gain. For example, the tree with rank 1 in family rank 1 was selected even though it was labeled "bifurcado en el punto ". There is also the effort to balance the %gain with diversity. Some selections have only 10% gain but they were chosen because they were the best tree in their families that had no other good trees. I chose these trees rather than a 2nd or 3rd tree from a better family in order to increase diversity.

Below is a table with the families, rankings, and # of candidates and selections. Some families had no candidates (7 of 33) and even more had no selections (11 of 33). Families were not chosen because of poor performance and/or lack of live trees. One of the last (30th) families did provide some candidates and 1 selection because there were some good trees despite the low family ranking.

The spreadsheet file I have sent has a number of sheets that are new since the last version:

Select30	Worksheet I used to determine the selections
List of 30	Your list of 30 selections
Dist Select	Distribution by family of the 140 candidates, 30 selections, and reason not selected
Rank Table	Same table as below
Dist selects by rep	Number of live trees, candidates and selections by rep. This may be useful when creating the thinning plan. These numbers are also printed on your map of the trial shown below
Rank by rep	This shows which fams (rank) are in each rep. This may help when you are deciding which trees to thin in any given rep
Thinning	This is a table of the <i>suggested</i> number of trees to thin in each rep

Guidelines for thinning trial 13-56-R01A

As I said above, there are some reasons to not simply thin the stand down to 140 candidate trees. This would work well in the small part of the trial (reps 20 – 25) where survival is 90%, but not in the other part of the trial where survival is only 54%. Because the trees are quite tall, a severe thinning would leave many trees vulnerable to stem breakage from wind. For this reason, we suggest to thin down to about 250 trees which is about 315 trees/hectare. After several years when the trees have grown into the open space, a second thinning can be done. Even after the first thinning, the genetic value of the entire stand will be greatly improved.

I have looked at the distributions of the trees and rankings by rep and have tried to create some guidelines that will be simple to follow. However, you and your team will make the final decisions of what to cut. The objectives of the thinning are to 1) increase genetic value by removing the inferior trees and poor families and 2) give more growing room to the remaining best trees. Some trees will be cut because they are poor individuals or from a bad family. In other cases, it is a silvicultural decision. If you have 5 great trees from a good family in a row, you will need to remove 2 or 3 of them. Here are some guidelines:

- Remove all trees in reps 1, 2, and 3, unless some trees in rep 3 are a useful buffer to rep 4. The remaining 21 reps have an area of about 0.8 hectares
- Leave up to 12 trees per rep. This equates to about 315 trees/hectare
- Leave all the 140 candidates (except rep 24 where there are two fams with 4 or 5 candidates)
- Give the 140 candidate trees as much room as possible to promote seed production
- When deciding which non-candidate trees to cut within a rep, consider:
 - Form and size
 - Proximity to candidates and other trees
 - Family ranking
- Feel free to modify these instructions based on what you see in the field

It will be a challenge to leave an evenly distributed stand because all the good families are clustered in rows. However, trees have a great capacity to grow into the space available and will fill in the gaps in the coming years. Good luck with the project and do not hesitate to ask Juan Lopez or myself any questions

Sincerely,



Willi Woodbridge

List of families and ranks

Sorted by Rank

Fam rank	Family	Candidates	Selections
1	13-02-85-1	4	2
2	13-02-60-1	13	2
3	04-02-9-1	14	2
4	13-07-760-1	7	2
5	13-02-792-1	10	2
6	13-02-146-1	6	2
7	04-02-100-1	11	1
8	13-02-44-1	10	2
9	13-02-178-1	4	1
10	BG34/06E	7	1
11	04-02-135-1	6	1
12	13-02-788-1	4	1
13	13-02-105-1	5	2
14	13-02-70-1	2	1
15	04-02-102-1	7	1
16	999 control	0	0
17	13-02-777-1	4	1
18	13-07-288-1	2	1
19	13-07-747-1	2	0
20	04-02-103-1	2	0
21	04-02-14-2	3	1
22	04-02-95-1	3	1
23	13-02-1006-1	4	1
24	16-02-2244-1	0	0
25	13-02-179-1	3	1
26	13-02-779-1	2	0
27	13-02-804-1	1	0
28	04-02-100-2	0	0
29	13-02-1013-1	0	0
30	13-02-26-1	4	1
31	998 control	0	0
32	13-02-806-1	0	0
33	997 control	0	0
TOTAL		140	30

Sorted by Family

Family	Fam rank
04-02-100-1	7
04-02-100-2	28
04-02-102-1	15
04-02-103-1	20
04-02-135-1	11
04-02-14-2	21
04-02-9-1	3
04-02-95-1	22
13-02-1006-1	23
13-02-1013-1	29
13-02-105-1	13
13-02-146-1	6
13-02-178-1	9
13-02-179-1	25
13-02-26-1	30
13-02-44-1	8
13-02-60-1	2
13-02-70-1	14
13-02-777-1	17
13-02-779-1	26
13-02-788-1	12
13-02-792-1	5
13-02-804-1	27
13-02-806-1	32
13-02-85-1	1
13-07-288-1	18
13-07-747-1	19
13-07-760-1	4
16-02-2244-1	24
997 control	33
998 control	31
999 control	16
BG34/06E	10

Distribution by rep of trees to thin

REP	Total live	Top 140	Top 30	To thin	Remaining
1	4	0	0	4	0
2	7	0	0	7	0
3	16	0	0	16	0
4	11	0	0	0	11
5	33	6	0	21	12
6	17	0	0	5	12
7	27	6	2	15	12
8	36	6	2	24	12
9	36	9	2	24	12
10	24	8	1	12	12
11	28	4	0	16	12
12	26	5	1	14	12
13	11	1	0	0	11
14	21	6	0	9	12
15	24	9	0	12	12
16	31	3	1	19	12
17	27	4	0	15	12
18	30	8	2	18	12
19	23	6	1	11	12
20	40	11	3	28	12
21	37	12	4	25	12
22	37	9	5	25	12
23	34	10	2	22	12
24	41	17	4	29	12
Total	621	140	30	371	250

559200

559400



Distribution of trees within 24 reps:

41 - 17 - 4

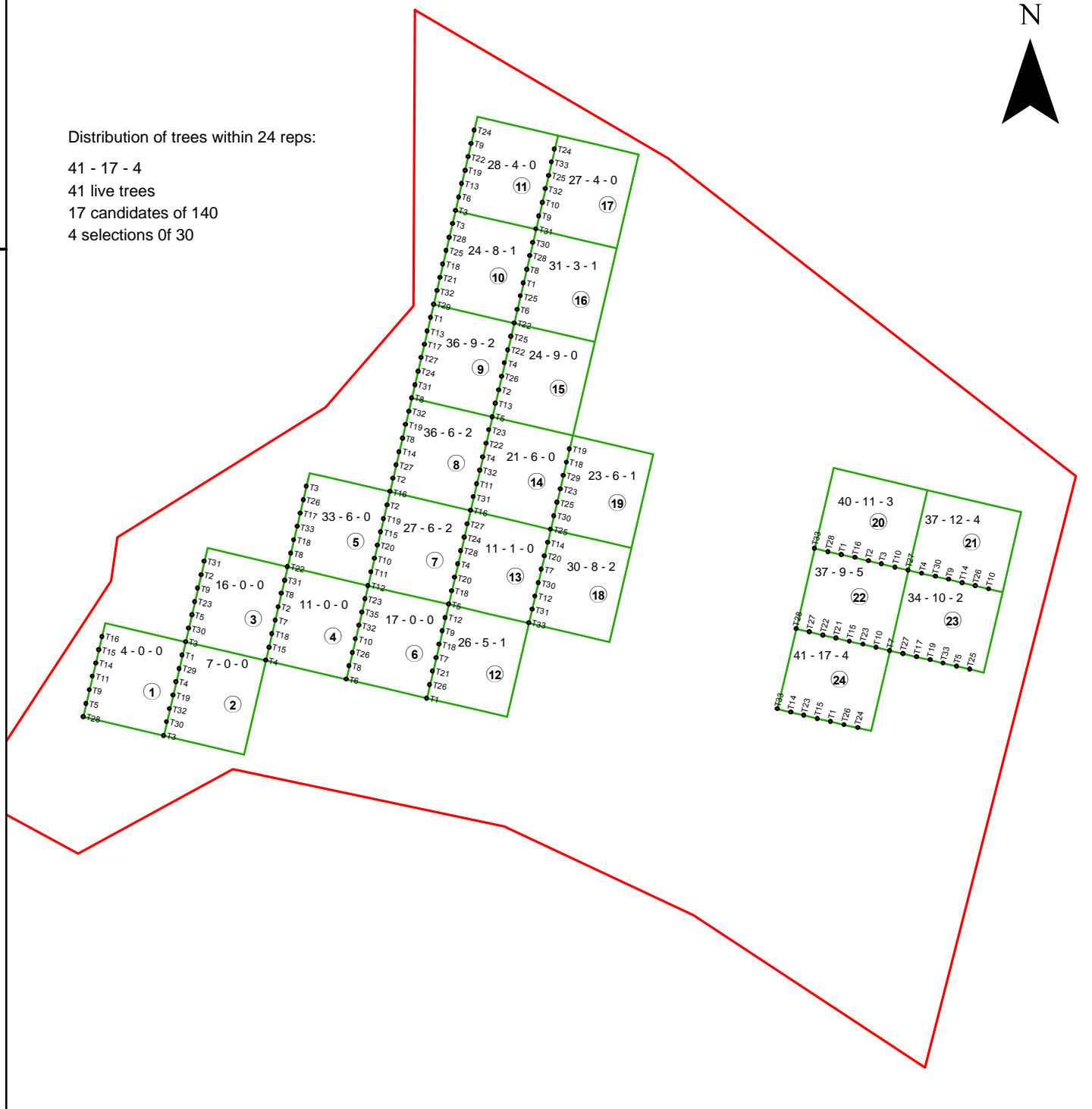
41 live trees

17 candidates of 140

4 selections of 30

1627400

1627400



MAPA DE DISTRIBUCIÓN DE FAMILIAS
FINCA LA LAGUNILLA
Jalapa, Jalapa



Evaluación del comportamiento de materiales
avanzados de Pinus tecunumanii
en su primer año de crecimiento

LEYENDA

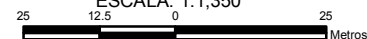
- Polígono del Ensayo (2.62 Hectáreas)
- Bloques
- Familias

Base: Ortofotos digitales del año 2,006 a escala 1:10,000 del -IGN-
Siembra de pino tecunumanii año 2,007
Datos de campo del año 2,008



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Tel: 2362-5132 y 20 Fax: 2362-5158
HENRY ARTURO SALAZAR BARRERA
JENIFFER SILVA YAT

ESCALA: 1:1,350



Datos proyectados:
Guatemala Transversal Mercator -GTM-
DATUM WGS-84